

Presenting

ORION[®]

By



In the **ORION brand** product range, you will find

- ✓ machining tools
- ✓ clamping devices
- ✓ measuring and testing equipment
- ✓ hand tools and
- ✓ much, much more.

Each one of the over 10,000 ORION products impresses with its functionality, safety and excellent price/performance ratio. Specially selected materials and high-quality workmanship ensure optimum handling.

International Business Services Ltd.

PO Box 2462, Garibaldi Highlands, BC V0N 1T0, Canada













Phone +1 604 898-9500

Toll Free 1-877-439-7423

FAX +1 604 909-5205

www.iconridge.com




Reaming tools

	Technical introduction – solid carbide / HSSE drilling
	Overview page for solid carbide drill
	Solid carbide high-performance drill, type UNI
	Overview page for NC spotting drill
	90° NC spotting drill
	120° NC spotting drill
	Overview page for twist drill
	Twist drill type N for universal use up to 1000 N/mm ²
	HSSE twist drill type VA for stainless steel machining
	Twist drill sets, HSS/HSSE
	Stepped drill bits
	Processing and machining technology - SC/HSSE drilling

Countersinking tools

	Overview page for countersinking tools
	SC conical countersink 90°
	HSS/HSSE conical countersink 90°
	SC conical countersink 60°
	HSS/HSSE conical countersink 60°
	HSS conical countersink 120°
	Hand countersink
	pipe deburrers
	SC deburrer
	Conical countersink with fixed pilot
	Counterbore with fixed pilot
	Tapered cone drills and core drills
	step drill

Drilling tools with indexable inserts

	Overview page for indexable insert drills
	indexable insert drill
	Processing and machining technology - Indexable insert drilling



Reaming tools	
	Technical introduction – reaming
	Overview page for reaming
	SC HPC machine reamers
	solid carbide machine reamers H7
	HSSE machine reamers H7
	HSS/HSSE rivet hole and quick-helix reamers
	HSS hand reamers
	Processing and machining technology - Reaming

Thread tools	
	Technical introduction – female thread production
	Technical introduction – thread tapping
	Machine tap overview page
	Machine tap M
	Machine taps MF
	Machine tap G
	Machine tap TR
	Hand tap G
	Hand tap M
	Hand tap MF

Thread tools	
	Technical introduction – thread forming
	Overview page - thread forming
	Technical introduction – thread milling
	Thread-cutting sets
	overview: threading dies
	Threading die G
	Threading die MF
	Threading die PG
	Threading die M
	Tool extensions
	Ratchet tools and inserts
	Tap wrenches and thread-cutting die holders
	Core hole tables, thread cutting, thread forming, thread milling



Machine sawing tools

	Technical introduction – metal circular saw blades
	Metal circular saw blades HSS shape A
	Metal circular saw blades HSS shape B
	Metal circular saw blades HSS shape C
	Metal circular saw blades with secondary pinholes
	Metal circular saw blade mount
	Technical introduction – metal bandsaw blades
	Processing and machining technology - Sawing

Milling tools monoblock

	Technical introduction – monobloc milling
	Overview page for solid carbide tools
	Solid carbide form milling cutter
	Labelling and marking tools
	Solid carbide mills for universal machining
	Solid carbide mill for trochoidal machining
	Solid carbide mills for machining aluminium
	Solid carbide mills for machining hard materials up to 65 HRC
	Overview page of HSSE/ HSSE PM tools

Milling tools monoblock

	HSSE form milling tool
	HSSE disc milling cutter
	HSSE/PM bore mill
	HSSE/PM end mill

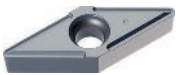
Modular milling tools

	Technical introduction – modular milling
	Face milling cutters
	Angular milling cutter
	Face and copy milling cutters

Turning tools

	Technical introduction – turning - ISO turning
	CC.. ISO indexable inserts, positive
	DC.. ISO indexable inserts, positive

Turning tools



VB.. ISO indexable inserts positive(2)



RC.. ISO indexable inserts, positive



VC.. ISO indexable inserts, positive



SC.. ISO indexable inserts, positive



CN.. ISO indexable inserts, negative



DN.. ISO indexable inserts, negative



KN.. ISO indexable inserts, negative



SN.. ISO indexable inserts, negative



TN.. ISO indexable inserts, negative



VN.. ISO indexable inserts, negative



WN.. ISO indexable inserts, negative



TC.. ISO indexable inserts, positive



Cermet indexable inserts



Technical introduction - CBN turning



Technical introduction - PCD turning



Technical Information/
standard sheet, ISO holder



Overview page for ISO holders



Technical info / standard
ISO boring bars

Turning tools



Overview page for ISO drilling bars

Info - boring bars



Parting tools



HSSE lathe chisel



Carbide-tipped lathe chisel



Lathe blanks



Processing and machining
technology - ISO turning



Technical introduction - knurling

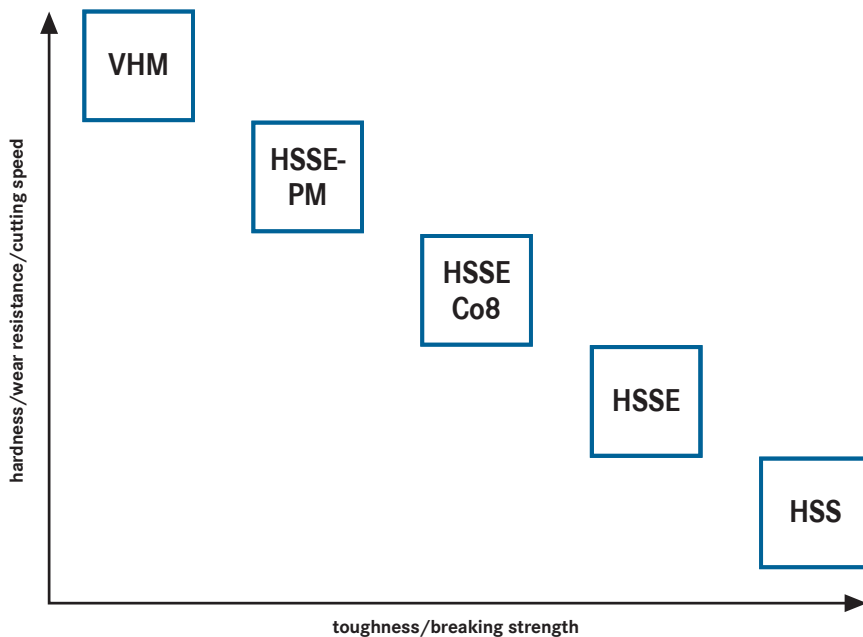
Coolants and lubricants



Jointed coolant hoses



drilling tools cutting materials



Solid carbide

- Very high hardness
- Cutting material for application up to 65 HRC
- Very high cutting speed
- High precision

HSSE-PM high-speed steel powder metal

- Cutting material for applications up to 1300 N/mm²
- Medium to high cutting speeds
- Highly elastic

HSSE Co8 high-speed steel

- Cutting material for applications up to 1300 N/mm²
- Medium to high cutting speeds
- approx. 8% cobalt content
- Extremely high elasticity

HSSE high-speed steel

- Cutting material for applications up to 1300 N/mm²
- Low to medium cutting speeds
- Approx. 5% cobalt content
- Extremely high elasticity

HSS high-speed steel

- Cutting material for applications up to 1000 N/mm²
- Low cutting speeds
- Low alloy content
- Extremely high elasticity



drilling tools coatings

titanium nitride

- universal layer for machining ferrous metals and steel materials
- very high cutting speed, high level of precision
- high level of hardness and adhesion
- good resistance to chemicals
- low edge rounding
- good temperature resistance in air
- relatively low thermal conductivity
- titanium nitride has a low level of reactivity toward ferrous metals. tool wear through galling is therefore significantly reduced.

technical data:

- Vickers hardness: 2200-2300 HV
- friction coefficient: 0.5
- temperature resistance: 500-600°
- colour: gold
- coating process: PVD

TiN



titanium aluminium nitride

- universal layer for high-performance machining with high cutting speed
- marked thermal and chemical stability
- dry machining
- very high hardness
- very good heat resistance
- relatively low thermal conductivity

technical data:

- Vickers hardness: 3200 HV
- friction coefficient of steel: 0.55
- temperature resistance: 900-1000°
- colour: dark blue-grey
- coating process: PVD

TiAlN



TiAlNOX

- universal layer for high-performance machining with high cutting speed
- can be classed as a multi-range coating as it can be used in a wide range of applications from steel machining, to machining of stainless steels right through to cast iron machining with a high level of success
- extremely smooth
- thermally and chemically very stable
- very high hardness
- very good heat resistance
- relatively low thermal conductivity

technical data:

- Vickers hardness: 3500 HV
- friction coefficient of steel: 0.5
- temperature resistance: 1000-1100°
- colour: violet-blue
- coating process: PVD

TiAlNOX



TiAlN Plus

- universal layer for high-performance machining of steels and cast iron
- wear-resistant multi-layer coating
- extremely smooth
- marked thermal and chemical stability
- very high hardness
- good heat resistance

technical data:

- Vickers hardness: 3300 HV
- friction coefficient of steel: 0.6
- temperature resistance: 800°
- colour: grey-violet
- coating process: PVD

TiAlN plus



ULTRA M

- special layer for high-performance machining of stainless steel and steel
- wear-resistant multi-layer material
- extremely smooth
- marked thermal and chemical stability
- very high hardness
- very good heat resistance

technical data:

- Vickers hardness: 3400 HV
- friction coefficient of steel: 0.55
- temperature resistance: 900°
- colour: grey-violet
- coating process: PVD

ULTRA M



CC

- special coating for high-performance machining of non-ferrous metals
- thanks to the low affinity for non-ferrous metals, built-up edges are a thing of the past
- high level of hardness makes CC extremely resistant to abrasion
- sharp cutting
- low affinity to non-ferrous metals
- extremely smooth
- thermally and chemically very stable
- very high hardness
- very good heat resistance

technical data:

- Vickers hardness: 4000 HV
- friction coefficient of steel: 0.55
- temperature resistance: 900°
- colour: silver
- coating process: PVD

CC





drilling tools geometries



grinding/geometry:

- tip angle 140°
- 2-surface grinding
- spiral angle 30°
- 2 drill heels on 3xD and 5xD
- 4 drill heels on 8xD and 12xD
- dia. tolerance h7 or m7

advantages:

- these geometries are specially developed for universal use
- the various coatings with cutting edge preparation prevents micro-breakouts on the blades, thereby increasing their service life



grinding/geometry:

- tip angle 140°
- for HPC drilling in the material groups stainless steel, titanium, nickel and special alloys
- 2-surface grinding
- spiral angle 30°
- 2 drill heels
- dia. tolerance h7

advantages:

- specially developed geometry for machining stainless steel, titanium, nickel alloys and special alloys
- Ultra M coating with cutting edge preparation prevents micro-breakouts on the blades, thereby increasing the service life



grinding/geometry:

- for HPC drilling in non-ferrous metals
- tip angle 135°
- spiral angle 15°
- 6 drill heels
- dia. tolerance h7

advantages:

- specialised use with long service life in non-ferrous metals such as aluminium, brass, bronze and cast iron
- 6 drill heels ensure even at very high cutting speeds for a drilling accuracy
- latest ALU-CC coating technology with superior form-fitting properties of the blade ensures sharp cutting edges and excellent sliding behaviour as well as optimum chip removal even at high cutting speeds



grinding/geometry:

- tip angle: 118°
- spiral angle: 38°
- precision-ground 4-surface grinding
- optimised point thinning similar to cross grinding
- straight main cutter

cutting material:

- HSSE: HSS steel with 5% cobalt alloy with greater hot hardness for increased loads

advantages:

- suitable for a wide range of applications thanks to the universal geometry design
- high level of process reliability through precision grinding
- extremely good centring properties thanks to the 4-surface grinding with point thinning results similar to cross-grinding (no centring required)
- low process forces (feeding force and torque) through optimised flute profile
- extremely precise, dimensionally accurate drilling in terms of the diameter and the roundness through smooth geometry design





grinding/geometry:

- tip angle: 118°
- spiral angle 30°
- cone polished section

cutting material:

- Universal HSS steel cutting material, for alloyed and unalloyed steels up to 1000 N/mm², steel casting, cast iron and iron alloys

Benefits:

- Suitable for a wide range of applications thanks to the universal geometry design
- Minimises tool costs
- Can be put to flexible use on both conventional and CNC machines, even in unstable conditions
- Low hardness, resulting in a high breaking strength



Grinding/geometry:

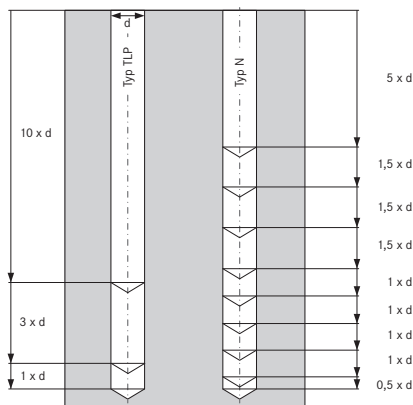
- cone polished section 130°
- spiral angle 38°
- point thinning type A

cutting material:

- Universal HSS steel cutting material, for alloyed and unalloyed steels up to 1000 N/mm², steel casting, cast iron and iron alloys
- HSSE: HSS steel with 5% cobalt alloy with greater hot hardness for increased loads up to 1300 N/mm²

Benefits:

- optimised flute profile for drilling deep holes in unfavourable conditions, such as insufficient cooling and poor chip removal
- depths of up to 25XD can be achieved
- special geometry for drilling long-chipping materials
- deep hole profile for optimising chip removal at greater drilling depths without the need for venting
- extremely good chip removal thanks to the size of the chipping space



grinding/geometry:

- spiral angle: 20°
- cross grinding: 135°
- point thinning ≥ 1.0 mm

cutting material:

- HSSE Co8%-alloyed steel for increased hot hardness

advantages:

- robust drill geometry for high alloy, high-strength materials from 700 N/mm²
- reinforced core
- for use on conventional and CNC machines



Typ
VA

grinding/geometry:

- cone polished section 130°
- spiral angle 35°
- point thinning type C
- increased core diameter

cutting material:

- HSSE: HSS steel with 5% cobalt alloy with greater hot hardness for increased loads up to 1300 N/mm²

advantages:

- positive geometry specially developed for use in stainless steel and special alloys
- special geometry with aggressive cutter design and free geometry for very smooth cutting



Typ
X

grinding/geometry:

- tip angle 130°
- precision-ground cone polished section + combination of point thinning types A/B
- cutting angle adjustment through type B point thinning element, ensuring a strong, stable cutting edge
- straight main cutter

cutting material:

- HSSE-PM steel offers highest level of wear resistance through powder-metallurgical steel
- extremely dense, homogeneous structure
- increased hardness and heat resistance
- high level of wear resistance and cutting edge stability

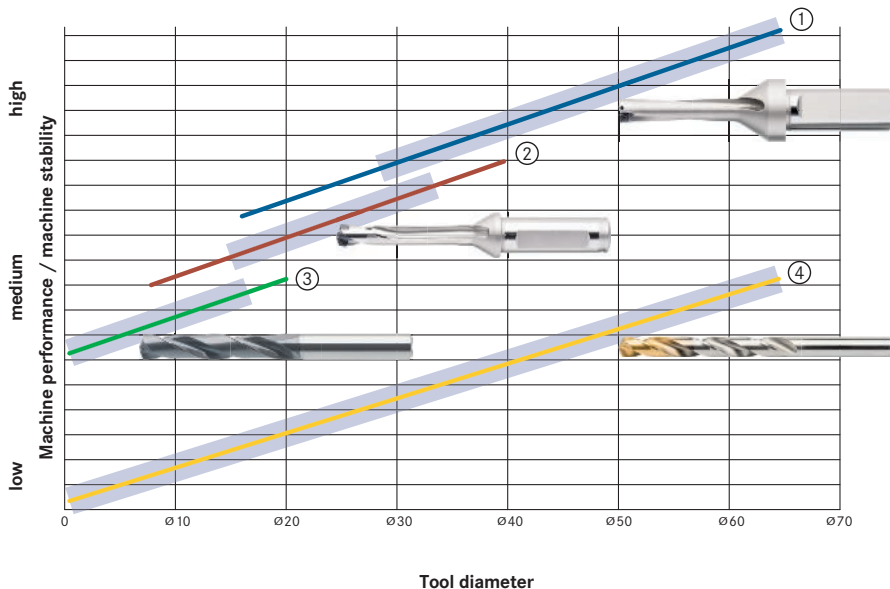
advantages:

- highest level of wear resistance and heat resistance through HSSE-PM cutting material and TiN coating
- economic drill that closes the gap between a standard HSS drill and a VHM drill for medium-strength materials and moderate batch sizes
- high cutting edge stability and robust drill design thanks to cone polished section with type A/B point thinning and optimised parabolic flute profile
- high process reliability thanks to the homogeneous structure of the HSSE-PM steel





economical range of different drill technologies

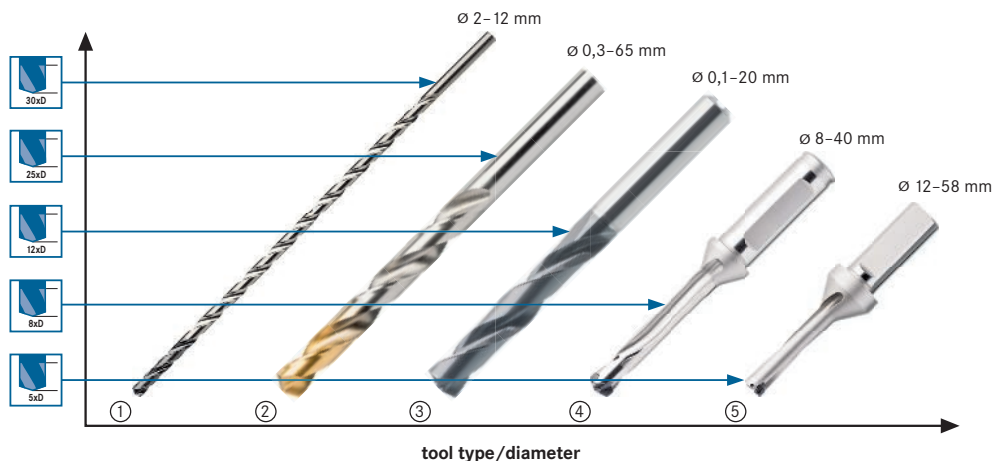


- ① indexable insert drill
- ② indexable insert drill
- ③ SC HPC drill
- ④ HSS/HSSE drill

= efficiency range depending on the diameter



tool type selection according to length and diameter

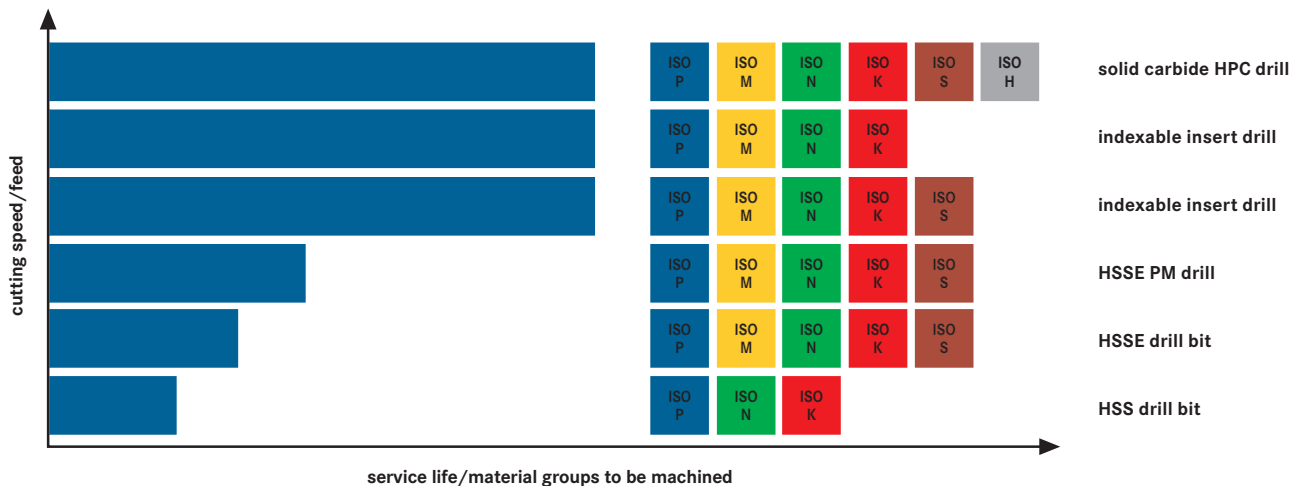


selection of small to medium-sized drill bit diameters
four different drill technologies are available for selection according to diameter and borehole depth.

- ① SC HPC deep hole drill
- ② HSS/HSSE drill
- ③ SC HPC drill
- ④ indexable insert drill
- ⑤ indexable insert drill







cutting speed/service life/material group diagram





bore types and surfaces

machining type	rough machining		medium finishing		smoothing	
	IT11	IT10	IT9	IT8	IT7	IT6
hole quality						
bore ϕ						
1 mm			 $\phi 1-20$ mm		 $\phi 1-20$ mm	
3 mm						
6 mm			 $\phi 8-40$ mm			
9 mm						
12 mm	 $\phi 12-58$ mm					
15 mm						
18 mm						
21 mm						
24 mm						
27 mm						
30 mm						
33 mm						
36 mm						
39 mm						
42 mm						
45 mm						
48 mm						
51 mm						
54 mm						
57 mm						
60 mm						
63 mm						
66 mm						
69 mm						

solid drilling/reaming



Clamping device recommendation for SC drills



	Standard collet chucks	precision collet chuck	Shrink-fit chucks	Hydro-expansion chucks	Surface chuck
Holding torques	○	○	○	○	●
concentricity	○	○	●	●	○
Vibration-reducing	○	○	○	●	○
Speed/balancing quality	○	●	●	●	○
internal cooling	Yes	Yes	Yes	Yes	Yes
Overall rating	Well-suited	Highly suitable	Highly suitable	Highly suitable	limited suitability

● = very well suited ○ = suitable ○ = limited suitability



Clamp method recommendation for HSS/HSSE/HSSE-PM drill



	Standard collet chucks	Precision collet chucks	Drill chucks
Holding torques	○	○	○
Concentricity	○	●	○
Vibration-reducing	●	●	○
Speed/balancing quality	●	●	○
Overall rating	Well suited	Very well suited	Well suited

● = Very well suited ○ = Suited ○ = Limited suitability



high-performance drill solid carbide TiAlN Plus range for universal use up to 1300 N/mm²

application:

for HPC bore machining up to a strength of 1300 N/mm²

advantage:

- economic drilling in a wide variety of materials with high cutting values
- newly-developed geometry combined with a drilling-specific multi-layer coating ensures a significantly longer service life
- cutting edge finishing reduces micro-fractures and increases the service life
- very extensive range from Ø1.00 mm – Ø20.00 mm in 3xD–12xD
- core hole dimensions available for thread tapping and thread forming
- 3xD + 5xD with and without internal coolant supply



	Ø	Coolant supply	Tool holding device	Max. drilling depth (D)	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	H 65HRC	
11102010-212	1.0-20.0 mm	Internal	HA parallel shank	3xD	●	●	●	○	●	○		
11102204-400	3.0-20.0 mm	Internal	HB parallel shank	3xD	●	●	●	○	●	○		
11104010-212	1.0-20.0 mm	External	HA parallel shank	3xD	●	●	●	○	●	○		
11104230-400	3.0-20.0 mm	External	HB parallel shank	3xD	●	●	●	○	●	○		
11105010-218	1.0-20.0 mm	Internal	HA parallel shank	5xD	●	●	●	○	●	○		
11105230-400	3.0-20.0 mm	Internal	HB parallel shank	5xD	●	●	●	○	●	○		
11108030-200	3.0-20.0 mm	Internal	HA parallel shank	8xD	●	●	●	○	●	○		
11110030-200	3.0-20.0 mm	Internal	HA parallel shank	12xD	●	●	●	○	●	○		



high-performance solid carbide TiAlAlOx drills For universal use up to a hardness of 63 HRC

Application:

For HPC boring up to 63 HRC.

advantage:

- Universal application up to a hardness of 63 HRC
- Latest coating technology: Unique, extremely hard, low-friction, temperature-resistant and form-fitting TiAlAlOx coating ensures extra service life and added process stability.
- Cutting edge preparation minimises micro-fractures on the cutter



	Ø	Coolant supply	Tool holding device	Max. drilling depth (D)	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	H 65HRC	
11183	3.0-20.0 mm	External	HB parallel shank	3xD	●	●	●	○	●	○	●	
11184	3.0-20.0 mm	Internal	HB parallel shank	3xD	●	●	●	○	●	○	●	
11188	3.0-20.0 mm	Internal	HB parallel shank	5xD	●	●	●	○	●	○	●	



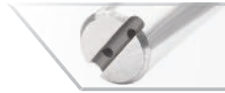
Solid carbide TiAlN high-performance drill range

Application:

For HPC boring up to a strength of 1300 N/mm².

advantage:

- universal high-performance tool with excellent price-performance ratio
- wide range of 3xD to 12xD
- 3xD + 5xD with and without internal coolant supply



	∅	Coolant supply	Tool holding device	Max. drilling depth (D)	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	H 65HRC	
11173	3.0-20.0 mm	External	HB parallel shank	3xD	●	●	○	○	●	○		
11174	3.0-20.0 mm	Internal	HB parallel shank	3xD	●	●	○	○	●	○		
11176230-403	3.0-20.0 mm	External	HB parallel shank	5xD	●	●	○	○	●	○		
11177	1.0-20.0 mm	Internal	HA parallel shank	5xD	●	●	○	○	●	○		
11177	1.0-20.0 mm	Internal	HB parallel shank	5xD	●	●	○	○	●	○		
11178	3.0-16.0 mm	Internal	HB parallel shank	8xD	●	●	○	○	●	○		
11179230-360	3.0-16.0 mm	Internal	HB parallel shank	12xD	●	●	○	○	●	○		



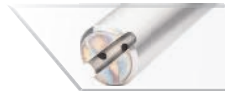
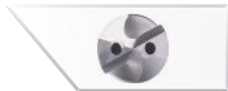
Ultra M solid carbide high-performance drill range

Application:

For HPC boring in the stainless steel, titanium, nickel and special alloy material groups.

advantage:

- special HPC cutter geometry: innovative cutter geometry with extremely smooth cutting blade and very high service life
- latest coating technology: newly developed form-fitting ULTRA M coating for extra service life and added process stability
- cutting edge preparation minimises micro-fractures on the cutter



	∅	Coolant supply	Tool holding device	Max. drilling depth (D)	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	H 65HRC	
11142030-601	3.0-20.0 mm	Internal	HA parallel shank	3xD			●			●		
11142204-603	3.0-20.0 mm	Internal	HB parallel shank	3xD			●			●		
11147030-203	3.0-20.0 mm	Internal	HA parallel shank	5xD			●			●		
11147204-400	3.0-20.0 mm	Internal	HB parallel shank	5xD			●			●		



Solid carbide ALU CC high-performance drill range

Application:

For HPC boring in the non-ferrous metals and cast iron material groups in series production.

advantage:

- innovative cutting geometry with 15° twist angle ensures optimum chip removal
- 6 drill heels ensure drilling accuracy even at high cutting speeds
- latest ALU-CC coating technology with superior form-fitting properties of the blade ensures sharp cutting edges and excellent good sliding behaviour as well as optimal chip removal



	∅	Coolant supply	Tool holding device	Max. drilling depth (D)	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	H 65HRC	
11158	2.5-20.0 mm	Internal	HA parallel shank	5xD				○	●			
11159	2.5-20.0 mm	Internal	HA parallel shank	8xD				○	●			



high-performance drill, solid carbide TiAlSiN HPC 3xD for hard machining up to 65 HRC

application:

for HPC boring up to 65HRC

advantage:

- high centring accuracy
- special coating for drilling hardened steels up to 65 HRC
- extremely hard, low-friction and temperature-resistant TiAlSiN coating for longer service life
- reinforced core with special tip and cutting chisel edge



high-performance deep-hole drill range – 16-30XD

Application:

For HPC deep-hole boring up to a strength of 1300 N/mm².

advantage:

- angle and diameter are co-ordinated across the whole range
- very good all-round properties and precise cutting behaviour with high cutting rates
- very good chip removal and chip control through by polished chipping space
- state-of-the-art coating technology ensures a long service life in the series
- high boring precision thanks to newly developed drill heels
- cutting edge preparation minimises micro-fractures on the cutter
- available in 40xD and 50xD on request



	∅	Coolant supply	Tool holding device	Max. drilling depth (D)	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	H 65HRC	
11181202-442	2.02-12.02 mm	Internal	HA parallel shank	5xD	●	●	○	○	●	○		
11179430-520	3.0-12.0 mm	Internal	HA parallel shank	16xD	●	●	●	○	●	○		
11181020-120	2.0-12.0 mm	Internal	HA parallel shank	20xD	●	●	●	○	●	○		
11189230-320	3.0-12.0 mm	Internal	HA parallel shank	25xD	●	●	○	○	●	○		
11182	2.0-12.0 mm	Internal	HA parallel shank	30xD	●	●	○	○	●	○		



i high-performance solid carbide micro drill

Application:
For HPC micro boring up to a strength of 1300 N/mm².

- advantage:**
- extremely hard, low-friction, temperature resistant and conforming coating ensures an increased service life
 - high-quality solid carbide cutting material and cutting edge preparation minimise breakouts on the blade
 - diameter of 0.10 mm to 3.00 mm
 - uncoated variant for non-ferrous metals



	∅	Coolant supply	Tool holding device	Max. drilling depth (D)	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	H 65HRC	
11137010-300	0.1-3.0 mm	External	HA parallel shank	5xD	●	●	●	○	●	●		
11137310-600	0.1-3.0 mm	External	HA parallel shank	5xD	○	○	○	●	○	○		

i high-performance drill 180° solid carbide TiAlN



applications:
for producing drill holes with 180° base of bore hole.

- advantages:**
- spot drilling on inclined surfaces
 - spot drilling on convex surfaces
 - spot drilling despite centre waste
 - spot drilling in existing drill holes
 - drilling through cross holes



	∅	Coolant supply	Tool holding device	Max. drilling depth (D)	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
11168201-400	3.0-20.0 mm	Internal	HA parallel shank	5xD	●	●		○	●		

i Solid carbide TiAlN high-performance drill reamer range

Application:
For producing clearance bore holes up to a strength of 1300 N/mm².

- advantage:**
- drilling and reaming in one work step, ensures high profitability
 - innovative cutting geometry with 6 drill heels ensures high bore hole quality
 - long service life owing to high-quality cutting material and coating



	∅	Coolant supply	Tool holding device	Max. drilling depth (D)	P 1000 N/mm ²	P 1300 N/mm ²	K	
11175380-446	3.98-20.0 mm	Internal	HA parallel shank	5xD	●	●	●	



Solid carbide TiNAlOX high-performance clearance drill

Application:

HPC special geometry for producing clearance bore holes in H7 quality.

advantage:

- high boring precision owing to 4 drill heels even at high cutting speeds
- innovative coating technology ensures increased service life



	Ø	Kühlung	Schaft	Max. drilling depth (D)	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
11176	3.0-20.0 mm	Internal	HA parallel shank	5xD	●	●	●	○	●	○	



solid carbide drill 3-blade

Application:

for precise position and shape drilling into the main body.

advantage:

- special geometry with 3 cutting edges: innovative cutting geometry for precise position and shape drilling into the main body without centring
- universal application: wide range of cemented carbide qualities and geometries for wide-ranging applications, therefore longer service life and high process stability



	Ø	Coolant supply	Tool holding device	Max. drilling depth (D)	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
11164	3.0-10.2 mm	External	HA parallel shank	5xD	○	○	●	○	○		
11166	3.0-10.2 mm	External	HA parallel shank	5xD	○	○			○		
11167	3.0-10.2 mm	External	HA parallel shank	5xD	○	○	●	○	○		



Twist drill, solid carbide, TYPE N range

Application:

Standard geometry for use up to a strength of 1300 N/mm².

advantage:

- excellent all-round properties and precise cutting behaviour in a wide range of materials
- universal application: minimises tool costs and improves flexibility
- high-quality cutting material and cutting edge preparation minimise micro-fractures on the cutter



	Ø	Max. drilling depth (D)	Coolant supply	Tool holding device	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
11150	0.5-16.0 mm	3xD	External	HA parallel shank	●	●	○	●	●	○	
11153	0.5-16.0 mm	3xD	External	HA parallel shank	●	●	○	●	●	○	
11155	1.0-13.0 mm	5xD	External	HA parallel shank	●	●	○	●	●	○	
11157	1.0-13.0 mm	5xD	External	HA parallel shank	●	●	○	●	●	○	



THE HIGHEST QUALITY PRODUCTS
FOR MAXIMUM EFFICIENCY.

WE HAVE WHAT IT TAKES.



For a complete range of products that meet the toughest demands, visit www.iconridge.com



high-performance solid carbide TiNAlOX drills
For universal use up to a hardness of 63 HRC

Application:

For HPC boring up to 63 HRC.

advantage:

- Universal application up to a hardness of 63 HRC
- Latest coating technology: Unique, extremely hard, low-friction, temperature-resistant and form-fitting TiNAlOX coating ensures extra service life and added process stability.
- Cutting edge preparation minimises micro-fractures on the cutter



ORION® high-performance drill bit, solid carbide TiNAlOX HPC 3xD with internal cooling (DIN 6537)
For universal use up to 63 HRC



Application:

For HPC boring up to 63HRC.

Advantage:

- universal application ensures maximum flexibility
- extremely hard, low-friction, temperature-resistant and form-fitting TiNAlOX coating ensures greater service life
- Cutting edge preparation minimises micro-fractures on the cutter

Execution:

- Solid carbide TiNAlOX high-performance drill

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11184	135	110	90	35	30	230	280	230	180	160	130	60			40	35	30	25	20

Tool holding device					HB parallel shank
Surface					TiNAlOX
Coolant supply					Internal
Tolerance of cutting edge Ø					m7
				f steel 1000 (mm/U)	11184... Ident. No.
3	6	20	62	0.09	030
3.1	6	20	62	0.09	031
3.2	6	20	62	0.09	032
3.25	6	20	62	0.09	325
3.3	6	20	62	0.09	033
3.4	6	20	62	0.09	034
3.5	6	20	62	0.09	035
3.6	6	20	62	0.09	036
3.7	6	20	62	0.09	037
3.8	6	24	66	0.09	038
3.9	6	24	66	0.09	039
4	6	24	66	0.09	040
4.1	6	24	66	0.09	041
4.2	6	24	66	0.09	042
4.3	6	24	66	0.09	043
4.4	6	24	66	0.09	044
4.5	6	24	66	0.09	045
4.6	6	24	66	0.09	046
4.65	6	24	66	0.09	465
4.7	6	24	66	0.09	047
4.8	6	28	66	0.09	048
4.9	6	28	66	0.09	049
5	6	28	66	0.09	050
5.1	6	28	66	0.09	051
5.2	6	28	66	0.09	052
5.3	6	28	66	0.09	053
5.4	6	28	66	0.09	054
5.5	6	28	66	0.1	055
5.55	6	28	66	0.1	555
5.6	6	28	66	0.1	056
5.7	6	28	66	0.1	057
5.8	6	28	66	0.1	058
5.9	6	28	66	0.1	059
6	6	28	66	0.1	060
6.1	8	34	79	0.1	061
6.2	8	34	79	0.1	062
6.3	8	34	79	0.1	063
6.4	8	34	79	0.1	064
6.5	8	34	79	0.11	065
6.6	8	34	79	0.11	066
6.7	8	34	79	0.11	067
6.8	8	34	79	0.11	068
6.9	8	34	79	0.11	069
7	8	34	79	0.11	070
7.1	8	41	79	0.11	071
7.2	8	41	79	0.11	072

Tool holding device					HB parallel shank
Surface					TiNAlOX
Coolant supply					Internal
Tolerance of cutting edge Ø					m7
				f steel 1000 (mm/U)	11184... Ident. No.
7.3	8	41	79	0.11	073
7.4	8	41	79	0.11	074
7.5	8	41	79	0.12	075
7.6	8	41	79	0.12	076
7.7	8	41	79	0.12	077
7.8	8	41	79	0.12	078
7.9	8	41	79	0.12	079
8	8	41	79	0.12	080
8.1	10	47	89	0.12	081
8.2	10	47	89	0.12	082
8.3	10	47	89	0.12	083
8.4	10	47	89	0.13	084
8.5	10	47	89	0.13	085
8.6	10	47	89	0.13	086
8.7	10	47	89	0.13	087
8.8	10	47	89	0.13	088
8.9	10	47	89	0.13	089
9	10	47	89	0.13	090
9.1	10	47	89	0.13	091
9.2	10	47	89	0.14	092
9.3	10	47	89	0.14	093
9.4	10	47	89	0.14	094
9.5	10	47	89	0.14	095
9.6	10	47	89	0.14	096
9.7	10	47	89	0.14	097
9.8	10	47	89	0.14	098
9.9	10	47	89	0.14	099
10	10	47	89	0.15	100
10.2	12	55	102	0.15	102
10.5	12	55	102	0.15	105
10.8	12	55	102	0.16	108
11	12	55	102	0.16	110
11.2	12	55	102	0.16	112
11.5	12	55	102	0.16	115
11.8	12	55	102	0.17	118
12	12	55	102	0.17	120
12.2	14	60	107	0.17	122
12.5	14	60	107	0.17	125
12.8	14	60	107	0.18	128
13	14	60	107	0.18	130
13.1	14	60	107	0.18	131
13.5	14	60	107	0.18	135
13.8	14	60	107	0.18	138
14	14	60	107	0.19	140
14.2	16	65	115	0.19	142
14.5	16	65	115	0.19	145



Tool holding device					HB parallel shank
Surface					TiNAlOX
Coolant supply					Internal
Tolerance of cutting edge Ø					m7
				f steel 1000 ● (mm/U)	11184... Ident. No.
14.8	16	65	115	0.19	148 ●
15	16	65	115	0.19	150 ●
15.1	16	65	115	0.19	151 ●
15.2	16	65	115	0.19	152 ●
15.5	16	65	115	0.2	155 ●
15.8	16	65	115	0.2	158 ●
16	16	65	115	0.2	160 ●
16.5	18	73	123	0.22	165 ●

Tool holding device					HB parallel shank
Surface					TiNAlOX
Coolant supply					Internal
Tolerance of cutting edge Ø					m7
				f steel 1000 ● (mm/U)	11184... Ident. No.
17	18	73	123	0.24	170 ●
17.5	18	73	123	0.26	175 ●
18	18	73	123	0.28	180 ●
18.5	20	79	131	0.29	185 ●
19	20	79	131	0.31	190 ●
19.5	20	79	131	0.33	195 ●
20	20	79	131	0.35	200 ●

Prod. Gr. 1AS

ORION® High-performance drill, solid carbide TiNAlOX HPC 3xD without internal cooling (DIN 6537) ● ● ● ● ● ●
 For universal use up to 63 HRC



Application:

For HPC boring up to 63HRC.

Advantage:

- universal application ensures maximum flexibility
- extremely hard, low-friction, temperature-resistant and form-fitting TiNAlOX coating ensures greater service life
- Cutting edge preparation minimises micro-fractures on the cutter

Execution:

- High-performance drill, solid carbide TiNAlOX without internal cooling

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11183	135	110	90	35	30	230	280	230	180	160	130	60		110	40	35	30	25	20

Tool holding device					HB parallel shank
Surface					TiNAlOX
Coolant supply					External
Tolerance of cutting edge Ø					m7
				f steel 1000 ● (mm/U)	11183... Ident. No.
3	6	20	62	0.09	030 ●
3.1	6	20	62	0.09	031 ●
3.2	6	20	62	0.09	032 ●
3.25	6	20	62	0.09	325 ●
3.3	6	20	62	0.09	033 ●
3.4	6	20	62	0.09	034 ●
3.5	6	20	62	0.09	035 ●
3.6	6	20	62	0.09	036 ●
3.7	6	20	62	0.09	037 ●
3.8	6	24	66	0.09	038 ●
3.9	6	24	66	0.09	039 ●
4	6	24	66	0.09	040 ●
4.1	6	24	66	0.09	041 ●
4.2	6	24	66	0.09	042 ●
4.3	6	24	66	0.09	043 ●
4.4	6	24	66	0.09	044 ●
4.5	6	24	66	0.09	045 ●
4.6	6	24	66	0.09	046 ●
4.65	6	24	66	0.09	465 ●
4.7	6	24	66	0.09	047 ●
4.8	6	28	66	0.09	048 ●
4.9	6	28	66	0.09	049 ●
5	6	28	66	0.09	050 ●
5.1	6	28	66	0.09	051 ●
5.2	6	28	66	0.09	052 ●
5.3	6	28	66	0.09	053 ●
5.4	6	28	66	0.09	054 ●
5.5	6	28	66	0.1	055 ●
5.55	6	28	66	0.1	555 ●
5.6	6	28	66	0.1	056 ●
5.7	6	28	66	0.1	057 ●
5.8	6	28	66	0.1	058 ●
5.9	6	28	66	0.1	059 ●
6	6	28	66	0.1	060 ●
6.1	8	34	79	0.1	061 ●
6.2	8	34	79	0.1	062 ●
6.3	8	34	79	0.1	063 ●
6.4	8	34	79	0.1	064 ●
6.5	8	34	79	0.11	065 ●
6.6	8	34	79	0.11	066 ●
6.7	8	34	79	0.11	067 ●
6.8	8	34	79	0.11	068 ●
6.9	8	34	79	0.11	069 ●
7	8	34	79	0.11	070 ●
7.1	8	41	79	0.11	071 ●
7.2	8	41	79	0.11	072 ●
7.3	8	41	79	0.11	073 ●

Tool holding device					HB parallel shank
Surface					TiNAlOX
Coolant supply					External
Tolerance of cutting edge Ø					m7
				f steel 1000 ● (mm/U)	11183... Ident. No.
7.4	8	41	79	0.11	074 ●
7.5	8	41	79	0.12	075 ●
7.6	8	41	79	0.12	076 ●
7.7	8	41	79	0.12	077 ●
7.8	8	41	79	0.12	078 ●
7.9	8	41	79	0.12	079 ●
8	8	41	79	0.12	080 ●
8.1	10	47	89	0.12	081 ●
8.2	10	47	89	0.12	082 ●
8.3	10	47	89	0.12	083 ●
8.4	10	47	89	0.13	084 ●
8.5	10	47	89	0.13	085 ●
8.6	10	47	89	0.13	086 ●
8.7	10	47	89	0.13	087 ●
8.8	10	47	89	0.13	088 ●
8.9	10	47	89	0.13	089 ●
9	10	47	89	0.13	090 ●
9.1	10	47	89	0.13	091 ●
9.2	10	47	89	0.14	092 ●
9.3	10	47	89	0.14	093 ●
9.4	10	47	89	0.14	094 ●
9.5	10	47	89	0.14	095 ●
9.6	10	47	89	0.14	096 ●
9.7	10	47	89	0.14	097 ●
9.8	10	47	89	0.14	098 ●
9.9	10	47	89	0.14	099 ●
10	10	47	89	0.15	100 ●
10.2	12	55	102	0.15	102 ●
10.5	12	55	102	0.15	105 ●
10.8	12	55	102	0.16	108 ●
11	12	55	102	0.16	110 ●
11.2	12	55	102	0.16	112 ●
11.5	12	55	102	0.16	115 ●
11.8	12	55	102	0.17	118 ●
12	12	55	102	0.17	120 ●
12.2	14	60	107	0.17	122 ●
12.5	14	60	107	0.17	125 ●
12.8	14	60	107	0.18	128 ●
13	14	60	107	0.18	130 ●
13.1	14	60	107	0.18	131 ●
13.5	14	60	107	0.18	135 ●
13.8	14	60	107	0.18	138 ●
14	14	60	107	0.19	140 ●
14.2	16	65	115	0.19	142 ●
14.5	16	65	115	0.19	145 ●
14.8	16	65	115	0.19	148 ●
15	16	65	115	0.19	150 ●

Drilling tools \ Solid carbide high-performance drill, type UNI

Tool holding device					HB parallel shank
Surface					TiNALOX
Coolant supply					External
Tolerance of cutting edge Ø					m7
mm	mm	mm	mm	f steel 1000 (mm/U)	11183... Ident. No.
15.1	16	65	115	0.19	151
15.2	16	65	115	0.19	152
15.5	16	65	115	0.2	155
15.8	16	65	115	0.2	158
16	16	65	115	0.2	160
16.5	18	73	123	0.22	165
17	18	73	123	0.24	170

Tool holding device					HB parallel shank
Surface					TiNALOX
Coolant supply					External
Tolerance of cutting edge Ø					m7
mm	mm	mm	mm	f steel 1000 (mm/U)	11183... Ident. No.
17.5	18	73	123	0.26	175
18	18	73	123	0.28	180
18.5	20	79	131	0.29	185
19	20	79	131	0.31	190
19.5	20	79	131	0.33	195
20	20	79	131	0.35	200

Prod. Gr. 1AS

ORION® high-performance drill bit, solid carbide TiNAlOX HPC 5xD with internal cooling (DIN 6537) For universal use up to 63 HRC



Application:

For HPC boring up to 63HRC.

Advantage:

- universal application ensures maximum flexibility
- extremely hard, low-friction, temperature-resistant and form-fitting TiNAlOX coating ensures greater service life
- Cutting edge preparation minimises micro-fractures on the cutter

Execution:

- Solid carbide TiNAlOX high-performance drill

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
11188	135	110	90	35	30	230	280	230	180	160	130	60			110	40	35	30	25	20

Tool holding device					HB parallel shank
Surface					TiNALOX
Coolant supply					Internal
Tolerance of cutting edge Ø					m7
mm	mm	mm	mm	f steel 1000 (mm/U)	11188... Ident. No.
3	6	28	66	0.09	030
3.1	6	28	66	0.09	031
3.2	6	28	66	0.09	032
3.25	6	28	66	0.09	325
3.3	6	28	66	0.09	033
3.4	6	28	66	0.09	034
3.5	6	28	66	0.09	035
3.6	6	28	66	0.09	036
3.7	6	28	66	0.09	037
3.8	6	36	74	0.09	038
3.9	6	36	74	0.09	039
4	6	36	74	0.09	040
4.1	6	36	74	0.09	041
4.2	6	36	74	0.09	042
4.3	6	36	74	0.09	043
4.4	6	36	74	0.09	044
4.5	6	36	74	0.09	045
4.6	6	36	74	0.09	046
4.65	6	36	74	0.09	465
4.7	6	36	74	0.09	047
4.8	6	44	82	0.09	048
4.9	6	44	82	0.09	049
5	6	44	82	0.09	050
5.1	6	44	82	0.09	051
5.2	6	44	82	0.09	052
5.3	6	44	82	0.09	053
5.4	6	44	82	0.09	054
5.5	6	44	82	0.1	055
5.55	6	44	82	0.1	555
5.6	6	44	82	0.1	056
5.7	6	44	82	0.1	057
5.8	6	44	82	0.1	058
5.9	6	44	82	0.1	059
6	6	44	82	0.1	060
6.1	8	53	91	0.1	061
6.2	8	53	91	0.1	062
6.3	8	53	91	0.1	063
6.4	8	53	91	0.1	064
6.5	8	53	91	0.11	065
6.6	8	53	91	0.11	066
6.7	8	53	91	0.11	067
6.8	8	53	91	0.11	068
6.9	8	53	91	0.11	069
7	8	53	91	0.11	070
7.1	8	53	91	0.11	071
7.2	8	53	91	0.11	072
7.3	8	53	91	0.11	073
7.4	8	53	91	0.11	074

Tool holding device					HB parallel shank
Surface					TiNALOX
Coolant supply					Internal
Tolerance of cutting edge Ø					m7
mm	mm	mm	mm	f steel 1000 (mm/U)	11188... Ident. No.
7.5	8	53	91	0.12	075
7.6	8	53	91	0.12	076
7.7	8	53	91	0.12	077
7.8	8	53	91	0.12	078
7.9	8	53	91	0.12	079
8	8	53	91	0.12	080
8.1	10	61	103	0.12	081
8.2	10	61	103	0.12	082
8.3	10	61	103	0.12	083
8.4	10	61	103	0.13	084
8.5	10	61	103	0.13	085
8.6	10	61	103	0.13	086
8.7	10	61	103	0.13	087
8.8	10	61	103	0.13	088
8.9	10	61	103	0.13	089
9	10	61	103	0.13	090
9.1	10	61	103	0.13	091
9.2	10	61	103	0.14	092
9.3	10	61	103	0.14	093
9.4	10	61	103	0.14	094
9.5	10	61	103	0.14	095
9.6	10	61	103	0.14	096
9.7	10	61	103	0.14	097
9.8	10	61	103	0.14	098
9.9	10	61	103	0.14	099
10	10	61	103	0.15	100
10.2	12	71	118	0.15	102
10.5	12	71	118	0.15	105
10.8	12	71	118	0.16	108
11	12	71	118	0.16	110
11.2	12	71	118	0.16	112
11.5	12	71	118	0.16	115
11.8	12	71	118	0.17	118
12	12	71	118	0.17	120
12.2	14	77	124	0.17	122
12.5	14	77	124	0.17	125
12.8	14	77	124	0.18	128
13	14	77	124	0.18	130
13.1	14	77	124	0.18	131
13.5	14	77	124	0.18	135
13.8	14	77	124	0.18	138
14	14	77	124	0.19	140
14.2	16	83	133	0.19	142
14.5	16	83	133	0.19	145
14.8	16	83	133	0.19	148
15	16	83	133	0.19	150
15.1	16	83	133	0.19	151
15.2	16	83	133	0.19	152



Tool holding device					HB parallel shank
Surface					TiN/ALOX
Coolant supply					Internal
Tolerance of cutting edge Ø					m7
				f steel 1000 ● (mm/U)	11188... Ident. No.
mm	mm	mm	mm		
15.5	16	83	133	0.2	155 ●
15.8	16	83	133	0.2	158 ●
16	16	83	133	0.2	160 ●
16.5	18	93	143	0.22	165 ●
17	18	93	143	0.24	170 ●
17.5	18	93	143	0.26	175 ●

Tool holding device					HB parallel shank
Surface					TiN/ALOX
Coolant supply					Internal
Tolerance of cutting edge Ø					m7
				f steel 1000 ● (mm/U)	11188... Ident. No.
mm	mm	mm	mm		
18	18	93	143	0.28	180 ●
18.5	20	101	153	0.29	185 ●
19	20	101	153	0.31	190 ●
19.5	20	101	153	0.33	195 ●
20	20	101	153	0.35	200 ●

Prod. Gr. 1AS

Solid carbide TiAlN high-performance drill range

Application:

For HPC boring up to a strength of 1300 N/mm².

advantage:

- universal high-performance tool with excellent price-performance ratio
- wide range of 3xD to 12xD
- 3xD + 5xD with and without internal coolant supply



ORION® high-performance drill bit, solid carbide TiAlN HPC 3xD with internal cooling (DIN 6537) for universal use up to 1300 N/mm²



Application:

For HPC boring up to a strength of 1300 N/mm².

Advantage:

- universal high-performance tool with excellent price/performance ratio
- 3xD + 5xD with and without IC

Execution:

- Solid carbide TiAlN high-performance drill

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11174	110	90	80	40	35	190	230	190	150	110	90	50		100	35	30	30		

Tool holding device					HB parallel shank
Surface					TiAlN
Coolant supply					Internal
Tolerance of cutting edge Ø					h7
				f steel 1000 ● (mm/U)	11174... Ident. No.
mm	mm	mm	mm		
3	6	20	62	0.13	230 ●
3.1	6	20	62	0.13	231 ●
3.2	6	20	62	0.13	232 ●
3.25	6	20	62	0.13	401 ●
3.3	6	20	62	0.13	233 ●
3.4	6	20	62	0.13	234 ●
3.5	6	20	62	0.13	235 ●
3.6	6	20	62	0.13	236 ●
3.7	6	20	62	0.13	237 ●
3.8	6	24	66	0.13	238 ●
3.9	6	24	66	0.13	239 ●
4	6	24	66	0.13	240 ●
4.1	6	24	66	0.13	241 ●
4.2	6	24	66	0.13	242 ●
4.3	6	24	66	0.13	243 ●
4.4	6	24	66	0.13	244 ●
4.5	6	24	66	0.13	245 ●
4.6	6	24	66	0.13	246 ●
4.65	6	24	66	0.13	402 ●
4.7	6	24	66	0.13	247 ●
4.8	6	28	66	0.13	248 ●
4.9	6	28	66	0.13	249 ●
5	6	28	66	0.13	250 ●
5.1	6	28	66	0.13	251 ●
5.2	6	28	66	0.13	252 ●
5.3	6	28	66	0.13	253 ●
5.4	6	28	66	0.13	254 ●
5.5	6	28	66	0.14	255 ●
5.55	6	28	66	0.14	403 ●
5.6	6	28	66	0.14	256 ●
5.7	6	28	66	0.14	257 ●
5.8	6	28	66	0.14	258 ●
5.9	6	28	66	0.14	259 ●
6	6	28	66	0.14	260 ●

Tool holding device					HB parallel shank
Surface					TiAlN
Coolant supply					Internal
Tolerance of cutting edge Ø					h7
				f steel 1000 ● (mm/U)	11174... Ident. No.
mm	mm	mm	mm		
6.1	8	34	79	0.14	261 ●
6.2	8	34	79	0.14	262 ●
6.3	8	34	79	0.14	263 ●
6.4	8	34	79	0.14	264 ●
6.5	8	34	79	0.15	265 ●
6.6	8	34	79	0.15	266 ●
6.7	8	34	79	0.15	267 ●
6.8	8	34	79	0.15	268 ●
6.9	8	34	79	0.15	269 ●
7	8	34	79	0.15	270 ●
7.1	8	41	79	0.15	271 ●
7.2	8	41	79	0.15	272 ●
7.3	8	41	79	0.15	273 ●
7.4	8	41	79	0.15	274 ●
7.5	8	41	79	0.17	275 ●
7.6	8	41	79	0.17	276 ●
7.7	8	41	79	0.17	277 ●
7.8	8	41	79	0.17	278 ●
7.9	8	41	79	0.17	279 ●
8	8	41	79	0.17	280 ●
8.1	10	47	89	0.17	281 ●
8.2	10	47	89	0.17	282 ●
8.3	10	47	89	0.17	283 ●
8.4	10	47	89	0.18	284 ●
8.5	10	47	89	0.18	285 ●
8.6	10	47	89	0.18	286 ●
8.7	10	47	89	0.18	287 ●
8.8	10	47	89	0.18	288 ●
8.9	10	47	89	0.18	289 ●
9	10	47	89	0.18	290 ●
9.1	10	47	89	0.18	291 ●
9.2	10	47	89	0.2	292 ●
9.3	10	47	89	0.2	293 ●
9.4	10	47	89	0.2	294 ●



Drilling tools \ Solid carbide high-performance drill, type UNI

Tool holding device					HB parallel shank	
Surface					TiAlN	
Coolant supply					Internal	
Tolerance of cutting edge Ø					h7	
mm	mm	mm	mm	f steel 1000 (mm/U)	11174... Ident. No.	
9.5	10	47	89	0.2	295	●
9.6	10	47	89	0.2	296	●
9.7	10	47	89	0.2	297	●
9.8	10	47	89	0.2	298	●
9.9	10	47	89	0.2	299	●
10	10	47	89	0.21	300	●
10.3	12	55	102	0.21	303	●
10.5	12	55	102	0.21	305	●
10.8	12	55	102	0.21	308	●
11	12	55	102	0.21	310	●
11.2	12	55	102	0.21	312	●
11.5	12	55	102	0.21	315	●
11.8	12	55	102	0.21	318	●
12	12	55	102	0.22	320	●
12.8	14	60	107	0.22	328	●
13	14	60	107	0.22	330	●
13.5	14	60	107	0.22	335	●

Prod. Gr. 140

ORION® high-performance drill bit, solid carbide TiAlN HPC 3xD without internal cooling

For universal use up to 1300 N/mm²



Application:

For HPC boring up to a strength of 1300 N/mm².

Advantage:

- universal high-performance tool with excellent price/performance ratio
- 3xD + 5xD with and without IC

Without internal cooling

Execution:

- Solid carbide TiAlN high-performance drill

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze	Plastics	Graphite G(C)FK	GG(G) GjMW	Titanalloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long						<55 HRC	<65 HRC
11173	110	90	80	40	35	190	230	190	150	110	90	50	100	35	30	30		

Tool holding device					HB parallel shank	
Surface					TiAlN	
Coolant supply					External	
Tolerance of cutting edge Ø					h7	
mm	mm	mm	mm	f steel 1000 (mm/U)	11173... Ident. No.	
3	6	20	62	0.13	230	●
3.1	6	20	62	0.13	231	●
3.2	6	20	62	0.13	232	●
3.25	6	20	62	0.13	401	●
3.3	6	20	62	0.13	233	●
3.4	6	20	62	0.13	234	●
3.5	6	20	62	0.13	235	●
3.6	6	20	62	0.13	236	●
3.7	6	20	62	0.13	237	●
3.8	6	24	66	0.13	238	●
3.9	6	24	66	0.13	239	●
4	6	24	66	0.13	240	●
4.1	6	24	66	0.13	241	●
4.2	6	24	66	0.13	242	●
4.3	6	24	66	0.13	243	●
4.4	6	24	66	0.13	244	●
4.5	6	24	66	0.13	245	●
4.6	6	24	66	0.13	246	●
4.65	6	24	66	0.13	402	●
4.7	6	24	66	0.13	247	●
4.8	6	28	66	0.13	248	●
4.9	6	28	66	0.13	249	●
5	6	28	66	0.13	250	●
5.1	6	28	66	0.13	251	●
5.2	6	28	66	0.13	252	●
5.3	6	28	66	0.13	253	●
5.4	6	28	66	0.13	254	●
5.5	6	28	66	0.14	255	●
5.55	6	28	66	0.14	403	●
5.6	6	28	66	0.14	256	●
5.7	6	28	66	0.14	257	●
5.8	6	28	66	0.14	258	●
5.9	6	28	66	0.14	259	●
6	6	28	66	0.14	260	●
6.1	8	34	79	0.14	261	●
6.2	8	34	79	0.14	262	●
6.3	8	34	79	0.14	263	●
6.4	8	34	79	0.14	264	●
6.5	8	34	79	0.15	265	●
6.6	8	34	79	0.15	266	●
6.7	8	34	79	0.15	267	●

Tool holding device					HB parallel shank	
Surface					TiAlN	
Coolant supply					External	
Tolerance of cutting edge Ø					h7	
mm	mm	mm	mm	f steel 1000 (mm/U)	11173... Ident. No.	
6.8	8	34	79	0.15	268	●
6.9	8	34	79	0.15	269	●
7	8	34	79	0.15	270	●
7.1	8	41	79	0.15	271	●
7.2	8	41	79	0.15	272	●
7.3	8	41	79	0.15	273	●
7.4	8	41	79	0.15	274	●
7.5	8	41	79	0.17	275	●
7.6	8	41	79	0.17	276	●
7.7	8	41	79	0.17	277	●
7.8	8	41	79	0.17	278	●
7.9	8	41	79	0.17	279	●
8	8	41	79	0.17	280	●
8.1	10	47	89	0.17	281	●
8.2	10	47	89	0.17	282	●
8.3	10	47	89	0.17	283	●
8.4	10	47	89	0.18	284	●
8.5	10	47	89	0.18	285	●
8.6	10	47	89	0.18	286	●
8.7	10	47	89	0.18	287	●
8.8	10	47	89	0.18	288	●
8.9	10	47	89	0.18	289	●
9	10	47	89	0.18	290	●
9.1	10	47	89	0.18	291	●
9.2	10	47	89	0.2	292	●
9.3	10	47	89	0.2	293	●
9.4	10	47	89	0.2	294	●
9.5	10	47	89	0.2	295	●
9.6	10	47	89	0.2	296	●
9.7	10	47	89	0.2	297	●
9.8	10	47	89	0.2	298	●
9.9	10	47	89	0.2	299	●
10	10	47	89	0.21	300	●
10.3	12	55	102	0.21	303	●
10.5	12	55	102	0.21	305	●
10.8	12	55	102	0.21	308	●
11	12	55	102	0.21	310	●
11.2	12	55	102	0.21	312	●
11.5	12	55	102	0.21	315	●
11.8	12	55	102	0.21	318	●
12	12	55	102	0.22	320	●

Tool holding device					HA parallel shank	HB parallel shank			
Surface					TiAlN	TiAlN			
Coolant supply					Internal	Internal			
Tolerance of cutting edge Ø					h7	h7			
	mm	mm	mm	mm	f steel 1000 (mm/U)	11177... Ident. No.		11177... Ident. No.	
10.8	12	71	118	0.22	-	-	308	●	
11	12	71	118	0.22	-	-	310	●	
11.2	12	71	118	0.22	-	-	312	●	
11.5	12	71	118	0.22	-	-	315	●	
11.8	12	71	118	0.24	-	-	318	●	
12	12	71	118	0.24	-	-	320	●	
12.2	14	77	124	0.24	-	-	322	●	
12.5	14	77	124	0.24	-	-	325	●	
12.8	14	77	124	0.3	-	-	328	●	
13	14	77	124	0.3	-	-	330	●	
13.5	14	77	124	0.3	-	-	335	●	
13.8	14	77	124	0.3	-	-	338	●	
14	14	77	124	0.32	-	-	340	●	
14.2	16	83	133	0.32	-	-	342	●	
14.5	16	83	133	0.32	-	-	345	●	

Prod. Gr. 140

ORION High-performance drill, solid carbide TiAlN HPC 5xD without internal cooling (DIN 6537) for universal use up to 1300 N/mm²



Application:
For HPC boring up to a strength of 1300 N/mm².

- Advantage:**
- universal high-performance tool with excellent price/performance ratio
 - 3xD + 5xD with and without IC

Execution:
■ High-performance drill, solid carbide TiAlN without internal cooling

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze	Plastics	Graphite G(C)FK	GG(G) GjMW	Titanium alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long						<55 HRC	<65 HRC
11176230-403	110	90	80	40	35	190	230	190	150	110	90	50	100	35	30	30		

Tool holding device					HB parallel shank		
Surface					TiAlN		
Coolant supply					External		
Tolerance of cutting edge Ø					m7		
	mm	mm	mm	mm	f steel 1000 (mm/U)	11176... Ident. No.	
3	6	28	66	0.13	230	●	
3.1	6	28	66	0.13	231	●	
3.2	6	28	66	0.13	232	●	
3.25	6	28	66	0.13	401	●	
3.3	6	28	66	0.13	233	●	
3.4	6	28	66	0.13	234	●	
3.5	6	28	66	0.13	235	●	
3.6	6	28	66	0.13	236	●	
3.7	6	28	66	0.13	237	●	
3.8	6	36	74	0.13	238	●	
3.9	6	36	74	0.13	239	●	
4	6	36	74	0.13	240	●	
4.1	6	36	74	0.13	241	●	
4.2	6	36	74	0.13	242	●	
4.3	6	36	74	0.13	243	●	
4.4	6	36	74	0.13	244	●	
4.5	6	36	74	0.13	245	●	
4.6	6	36	74	0.13	246	●	
4.65	6	36	74	0.13	402	●	
4.7	6	36	74	0.13	247	●	
4.8	6	44	82	0.13	248	●	
4.9	6	44	82	0.13	249	●	
5	6	44	82	0.13	250	●	
5.1	6	44	82	0.13	251	●	
5.2	6	44	82	0.13	252	●	
5.3	6	44	82	0.13	253	●	
5.4	6	44	82	0.14	254	●	
5.5	6	44	82	0.15	255	●	
5.55	6	44	82	0.15	403	●	
5.6	6	44	82	0.15	256	●	
5.7	6	44	82	0.15	257	●	
5.8	6	44	82	0.15	258	●	
5.9	6	44	82	0.15	259	●	
6	6	44	82	0.15	260	●	
6.1	8	53	91	0.15	261	●	
6.2	8	53	91	0.15	262	●	
6.3	8	53	91	0.15	263	●	
6.4	8	53	91	0.15	264	●	
6.5	8	53	91	0.17	265	●	
6.6	8	53	91	0.17	266	●	
6.7	8	53	91	0.17	267	●	
6.8	8	53	91	0.17	268	●	

Tool holding device					HA parallel shank	HB parallel shank			
Surface					TiAlN	TiAlN			
Coolant supply					Internal	Internal			
Tolerance of cutting edge Ø					h7	h7			
	mm	mm	mm	mm	f steel 1000 (mm/U)	11177... Ident. No.		11177... Ident. No.	
14.8	16	83	133	0.32	-	-	348	●	
15	16	83	133	0.32	-	-	350	●	
15.1	16	83	133	0.32	-	-	351	●	
15.5	16	83	133	0.35	-	-	355	●	
15.8	16	83	133	0.35	-	-	358	●	
16	16	83	133	0.35	-	-	360	●	
16.5	18	93	143	0.35	-	-	365	●	
17	18	93	143	0.35	-	-	370	●	
17.5	18	93	143	0.35	-	-	375	●	
18	18	93	143	0.35	-	-	380	●	
18.5	20	101	153	0.35	-	-	385	●	
19	20	101	153	0.35	-	-	390	●	
19.5	20	101	153	0.35	-	-	395	●	
20	20	101	153	0.35	-	-	400	●	



Tool holding device					HB parallel shank
Surface					TiAlN
Coolant supply					External
Tolerance of cutting edge Ø					m7
				f steel 1000 (mm/U)	11176... Ident. No.
11.1	12	71	118	0.3	311 ●
11.2	12	71	118	0.3	312 ●
11.3	12	71	118	0.3	313 ●
11.4	12	71	118	0.3	314 ●
11.5	12	71	118	0.32	315 ●
11.6	12	71	118	0.32	316 ●
11.7	12	71	118	0.32	317 ●
11.8	12	71	118	0.32	318 ●
11.9	12	71	118	0.32	319 ●
12	12	71	118	0.32	320 ●
12.2	14	77	124	0.35	322 ●
12.3	14	77	124	0.35	323 ●
12.5	14	77	124	0.35	325 ●
12.8	14	77	124	0.35	328 ●
13	14	77	124	0.35	330 ●
13.5	14	77	124	0.35	335 ●
13.8	14	77	124	0.35	338 ●

Tool holding device					HB parallel shank
Surface					TiAlN
Coolant supply					External
Tolerance of cutting edge Ø					m7
				f steel 1000 (mm/U)	11176... Ident. No.
14	14	77	124	0.35	340 ●
14.2	16	83	133	0.35	342 ●
14.5	16	83	133	0.35	345 ●
14.8	16	83	133	0.35	348 ●
15	16	83	133	0.35	350 ●
15.1	16	83	133	0.35	351 ○
15.5	16	83	133	0.35	355 ●
15.8	16	83	133	0.35	358 ●
16	16	83	133	0.4	360 ●
16.5	18	93	143	0.4	365 ●
17	18	93	143	0.4	370 ●
17.5	18	93	143	0.4	375 ●
18	18	93	143	0.4	380 ●
18.5	20	101	153	0.45	385 ●
19	20	101	153	0.45	390 ●
19.5	20	101	153	0.45	395 ●
20	20	101	153	0.45	400 ●

Prod. Gr. 140

ORION® high-performance drill bit, solid carbide TiAlN HPC 8xD with internal cooling for universal use up to 1300 N/mm²



Application:

For HPC boring up to a strength of 1300 N/mm².

Advantage:

- universal high-performance tool with excellent price/performance ratio
- very high alignment accuracy thanks to 4 drill heels
- high process reliability even at extreme depths

Execution:

- Solid carbide TiAlN high-performance drill

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GJMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11178	110	90	80	40	35	190	230	190	150	110	90	50		100	35	30	30		

Tool holding device					HB parallel shank
Surface					TiAlN
Coolant supply					Internal
Tolerance of cutting edge Ø					h7
				f steel 1000 (mm/U)	11178... Ident. No.
3	6	34	72	0.1	230 ●
3.1	6	34	72	0.1	231 ●
3.2	6	34	72	0.1	232 ●
3.3	6	34	72	0.1	233 ●
3.4	6	34	72	0.1	234 ●
3.5	6	34	72	0.1	235 ●
3.6	6	34	72	0.1	236 ●
3.7	6	34	72	0.1	237 ●
3.8	6	43	81	0.1	238 ●
3.9	6	43	81	0.1	239 ●
4	6	43	81	0.1	240 ●
4.1	6	43	81	0.1	241 ●
4.2	6	43	81	0.1	242 ●
4.3	6	43	81	0.1	243 ●
4.4	6	43	81	0.1	244 ●
4.5	6	43	81	0.1	245 ●
4.6	6	43	81	0.1	246 ●
4.7	6	57	95	0.1	247 ●
4.8	6	57	95	0.1	248 ●
4.9	6	57	95	0.1	249 ●
5	6	57	95	0.1	250 ●
5.1	6	57	95	0.1	251 ●
5.2	6	57	95	0.1	252 ●
5.3	6	57	95	0.1	253 ●
5.4	6	57	95	0.1	254 ●
5.5	6	57	95	0.13	255 ●
5.6	6	57	95	0.13	256 ●
5.7	6	57	95	0.13	257 ●
5.8	6	57	95	0.13	258 ●
5.9	6	57	95	0.13	259 ●
6	6	57	95	0.13	260 ●
6.1	8	76	114	0.13	261 ●
6.2	8	76	114	0.13	262 ●
6.3	8	76	114	0.13	263 ●
6.4	8	76	114	0.13	264 ●
6.5	8	76	114	0.15	265 ●
6.6	8	76	114	0.15	266 ●
6.7	8	76	114	0.15	267 ●
6.8	8	76	114	0.15	268 ●
6.9	8	76	114	0.15	269 ●

Tool holding device					HB parallel shank
Surface					TiAlN
Coolant supply					Internal
Tolerance of cutting edge Ø					h7
				f steel 1000 (mm/U)	11178... Ident. No.
7	8	76	114	0.15	270 ●
7.1	8	76	114	0.15	271 ●
7.2	8	76	114	0.15	272 ●
7.3	8	76	114	0.15	273 ●
7.4	8	76	114	0.15	274 ●
7.5	8	76	114	0.17	275 ●
7.6	8	76	114	0.17	276 ●
7.7	8	76	114	0.17	277 ●
7.8	8	76	114	0.17	278 ●
7.9	8	76	114	0.17	279 ●
8	8	76	114	0.17	280 ●
8.1	10	95	142	0.17	281 ●
8.2	10	95	142	0.17	282 ●
8.3	10	95	142	0.17	283 ●
8.4	10	95	142	0.18	284 ●
8.5	10	95	142	0.18	285 ●
8.6	10	95	142	0.18	286 ●
8.7	10	95	142	0.18	287 ●
8.8	10	95	142	0.18	288 ●
8.9	10	95	142	0.18	289 ●
9	10	95	142	0.18	290 ●
9.1	10	95	142	0.18	291 ●
9.2	10	95	142	0.2	292 ●
9.3	10	95	142	0.2	293 ●
9.4	10	95	142	0.2	294 ●
9.5	10	95	142	0.2	295 ●
9.6	10	95	142	0.2	296 ●
9.7	10	95	142	0.2	297 ●
9.8	10	95	142	0.2	298 ●
9.9	10	95	142	0.2	299 ●
10	10	95	142	0.21	300 ●
10.5	12	114	162	0.21	305 ●
10.8	12	114	162	0.21	308 ●
11	12	114	162	0.21	310 ●
11.5	12	114	162	0.21	315 ●
11.8	12	114	162	0.22	318 ●
12	12	114	162	0.22	320 ●
12.5	14	133	178	0.22	325 ●
13	14	133	178	0.22	330 ●
13.5	14	133	178	0.22	335 ●



Drilling tools \ Solid carbide high-performance drill, type UNI

Tool holding device					HB parallel shank
Surface					TiAlN
Coolant supply					Internal
Tolerance of cutting edge Ø					h7
mm	mm	mm	mm	f steel 1000 ● (mm/U)	11178... Ident. No.
14	14	133	178	0.24	340 ●
14.5	16	152	203	0.24	345 ●
15	16	152	203	0.24	350 ●

Tool holding device					HB parallel shank
Surface					TiAlN
Coolant supply					Internal
Tolerance of cutting edge Ø					h7
mm	mm	mm	mm	f steel 1000 ● (mm/U)	11178... Ident. No.
15.5	16	152	203	0.3	355 ●
16	16	152	203	0.3	360 ●

Prod. Gr. 140

ORION high-performance drill bit, solid carbide TiAlN HPC 12xD with internal cooling for universal use up to 1300 N/mm²



Application:

For HPC boring up to a strength of 1300 N/mm².

Advantage:

- universal high-performance tool with excellent price/performance ratio
- very high alignment accuracy thanks to 4 drill heels
- high process reliability even at extreme depths

Execution:

- Solid carbide TiAlN high-performance drill

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11179230-360	110	90	80	40	35	190	230	190	150	110	90	50		100	35	30	30		

Tool holding device					HB parallel shank
Surface					TiAlN
Coolant supply					Internal
Tolerance of cutting edge Ø					h7
mm	mm	mm	mm	f steel 1000 ● (mm/U)	11179... Ident. No.
3	6	54	92	0.1	230 ●
3.3	6	54	92	0.1	233 ●
3.5	6	54	92	0.1	235 ●
3.8	6	64	102	0.1	238 ●
4	6	64	102	0.1	240 ●
4.2	6	64	102	0.1	242 ●
4.5	6	64	102	0.1	245 ●
4.8	6	78	116	0.1	248 ●
5	6	78	116	0.1	250 ●
5.5	6	78	116	0.1	255 ●
5.8	6	78	116	0.1	258 ●
6	6	78	116	0.1	260 ●
6.5	8	108	146	0.13	265 ●
6.8	8	108	146	0.13	268 ●
7	8	108	146	0.13	270 ●
7.5	8	108	146	0.15	275 ●
7.8	8	108	146	0.15	278 ●
8	8	108	146	0.15	280 ●
8.5	10	120	162	0.15	285 ●
8.8	10	120	162	0.15	288 ●
9	10	120	162	0.2	290 ●
9.5	10	120	162	0.2	295 ●
9.8	10	120	162	0.2	298 ●
10	10	120	162	0.2	300 ●
10.2	12	156	204	0.2	302 ●
10.5	12	156	204	0.2	305 ●
10.8	12	156	204	0.2	308 ●
11	12	156	204	0.24	310 ●
11.5	12	156	204	0.24	315 ●
11.8	12	156	204	0.26	318 ●
12	12	156	204	0.26	320 ●
12.5	14	182	230	0.26	325 ●
12.8	14	182	230	0.26	328 ●
13	14	182	230	0.26	330 ●
13.5	14	182	230	0.26	335 ●
14	14	182	230	0.26	340 ●
14.5	16	208	260	0.26	345 ●
15	16	208	260	0.26	350 ●
15.5	16	208	260	0.26	355 ●
16	16	208	260	0.26	360 ●

Prod. Gr. 140



high-performance deep-hole drill range – 16-30XD

Application:

For HPC deep-hole boring up to a strength of 1300 N/mm².

advantage:

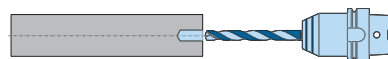
- angle and diameter are co-ordinated across the whole range
- very good all-round properties and precise cutting behaviour with high cutting rates
- very good chip removal and chip control through by polished chipping space
- state-of-the-art coating technology ensures a long service life in the series
- high boring precision thanks to newly developed drill heels
- cutting edge preparation minimises micro-fractures on the cutter
- available in 40xD and 50xD on request



process description, deep hole drilling

drilling the pilot bore hole

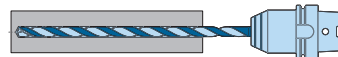
- in order to get an accurate pitch, we recommend centring with our NC spotting drill no 11169.
- for the pilot hole, we recommend our no. 11181.
- these are 0.02 mm larger in diameter than the corresponding deep-hole drills and have a tip angle of 140°.
- the pilot hole should be at least 3xD in depth, to a maximum of 5xD.



entering the pilot bore hole with the deep hole drill

deep hole drilling up to 30xD

- please enter the pilot hole at low rotation speed ($n = 300$ rpm) and a low feed rate ($V_f = 1000$ mm/min), 1-2 mm before reaching the hole base, stop the feed. then increase the rotation speed continuously until reaching the final speed. allow sufficient idling time to ensure that the cooling pump has built up enough pressure.



deep hole drilling

- carry out deep hole drilling with the recommended cutting values, do not remove chips.
- for cross-drilled holes or exiting, reduce the feed by 50 %.



extending the deep hole drill

- retract the deep hole drill by about 1-2 mm from the base of the hole
- reduce the rotation speed to ($n = 300$ rpm) and travel out of the hole with a low feed rate of ($V_f = 1000$ mm/min). Cooling must be switched off during this process.





90° NC spotting drill



application: for NC drilling 90° on conventional and CNC machines. drilling and countersinking in a single operation.

	Ø	Cutting material	P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	S	H 55HRC	
11016	3-25 mm	HSSE	●	●	●	●	●			
11019031-251	3-25 mm	HSSE	●	●	●	●	●	○		
11019606-620	6-20 mm	HSSE	●	●	●	●	●	●		
11016740-860	4-16 mm	HSSE	●	●	●	●	●			
11019541-661	4-16 mm	HSSE	●	●	●	●	●	○		
11018	3-20 mm	VHM	●	●	●	●	●	●	○	
11016035-205	3-20 mm	HSSE	●	●	●	●	●			
11022	3-16 mm	HSS	●	●	●	●	●	●		



120° NC spotting drill



application: for NC drilling 120° on conventional and CNC machines. ensures optimum centring for 118° drills.

	Ø	Cutting material	P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	S	H 55HRC	
11015	3-25 mm	HSSE	●	●	●	●	●			
11019030-160	3-16 mm	HSSE	●	●	●	●	●	○		
11019506-516	6-16 mm	HSSE	●	●	●	●	●	●		
11017	3-20 mm	VHM	●	●	●	●	●	●	○	




142° NC spotting drill



Application: For 142° NC spot drilling on CNC machines. Guarantees optimum centring for HPC 140° drills.

advantage:

- hole can be positioned precisely
- following tool does not wander
- centring recommended for HPC drills from 8xD

	Ø	Cutting material	P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	S	H 55HRC	
11169	6-20 mm	VHM	●	●	●	●	●	○	○	

ATORN® ORION® HSSE 90° NC spotting drill for universal use up to 1300 N/mm²



Application:

For NC spot drilling on conventional and CNC machines.

Execution:

- spiral-fluted design with relief grinding

Advantage:

- No. 11016 030-11016 250, 11019 031-11019 251, 11019 606-11019 620:** short design with precise point geometry and chisel edge ensure form-true and reliable spot drilling

- No. 11016 030-11016 860, 11019 541-11019 661:** 90° NC spotting drill for spot drilling and countersinking in a single action
- No. 11016 740-11016 860, 11019 541-11019 601, 11019 621-11019 661:**
 - profile-ground, cost-effective NC spotting drill
 - short design with cross-cutter
- No. 11019 031-11019 251:** 90° NC spotting drill for drilling and countersinking in one step
- No. 11019 031-11019 601, 11019 621-11019 661:** TiN coating for increased service life requirements
- No. 11019 606-11019 620:** TiNAlOX coating for increased service life requirements



No. 11016

No. 11019 031-11019 601, 11019 621-11019 661

No. 11019 606-11019 620

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11016	40	20	10	12	10	70	80	40	35	35	30	20	10	20	6				
11016740-860	40	20	10	12	10	70	80	40	35	35	30	20	10	20	6				
11019031-251	50	30	12	20	15	80	90	50	40	45	40	30	10	30	10	10	10		
11019541-661	50	30	12	20	15	80	90	50	40	45	40	30	10	30	10	10	10		
11019606-620	50	30	10	20	15	80	90	50	40	45	40	30	10	30	8	8	8		

Surface				ATORN®		ATORN®		ORION®		ORION®		ATORN®	
Tool holding device				Uncoated		TiN		Uncoated		TiN		TiNAlOX	
f steel 1000 (mm/U)				HA parallel shank		HA parallel shank		HA parallel shank		HA parallel shank		HB parallel shank	
mm	mm	mm		11016... Ident. No.		11019... Ident. No.		11016... Ident. No.		11019... Ident. No.		11019... Ident. No.	
3	10	50	0.04	030	●	031	●	-	-	-	-	-	-
4	12	52	0.05	040	●	041	●	740	●	541	●	-	-
5	15	60	0.05	050	●	051	●	751	●	552	●	-	-
6	20	66	0.06	060	●	061	●	761	●	561	●	606	●
8	25	79	0.07	080	●	081	●	780	●	581	●	608	●
10	25	89	0.08	100	●	101	●	800	●	601	●	610	●
12	30	102	0.08	120	●	121	●	820	●	621	●	612	●
14	35	115	0.09	140	●	-	-	-	-	-	-	-	-
16	35	115	0.09	160	●	161	●	860	●	661	●	616	●
18	40	131	0.09	180	●	181	●	-	-	-	-	-	-
20	40	131	0.09	200	●	201	●	-	-	-	-	620	●
25	45	138	0.1	250	●	251	●	-	-	-	-	-	-

ATORN® = Prod. Gr. 1AD
ORION = Prod. Gr. 1AO

ATORN® ORION® NC spotting drill solid carbide 90° for universal use up to 1300 N/mm²



Application:

For NC spot drilling on CNC machines.

Execution:

- spiral-fluted design with relief grinding

Advantage:

- short design with precise point geometry and chisel edge ensure form-true and reliable spot drilling

- Solid carbide cutting material for a broad range of uses and long service life in series production
- Ident. No. 030-201, 530-701:** 90° NC spotting drill for drilling and countersinking in one step
- Ident. No. 361-461:** 90° NC spotting drill for spot drilling and countersinking in a single action

Notes:

Ident. No. 530-701: Diameter <6 mm with HA shaft






Ident. No. 030-461



Ident. No. 530-701

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11018	70	60	40	30	25	180	200	150	130	80	70	50	20	70	20	20	20	4	
11018361-461	70	60	40	30	25	180	200	150	130	80	70	50	20	70	20	20	20	4	
11018530-701	70	60	40	30	25	180	200	150	130	80	70	50	20	70	20	20	20	4	

Drilling tools \ 90° NC spotting drill

				ATORN®		ATORN®		ATORN®		ORION®		ATORN®	
Surface				Uncoated		TiAlN plus		Uncoated		Uncoated		TiAlN plus	
Tool holding device				HA parallel shank		HA parallel shank		HB parallel shank		HB parallel shank		HB parallel shank	
f steel 1300 ● (mm/U)				11018... Ident. No.		11018... Ident. No.		11018... Ident. No.		11018... Ident. No.		11018... Ident. No.	
				030	●	530	●	-	-	-	-	-	-
3	12	46	0.03	030	●	530	●	-	-	-	-	-	-
4	12	55	0.04	040	●	540	●	-	-	-	-	-	-
5	14	62	0.05	050	●	550	●	-	-	-	-	-	-
6	20	66	0.06	-	-	-	-	061	●	361	●	561	●
8	25	79	0.06	-	-	-	-	081	●	381	●	581	●
10	25	89	0.07	-	-	-	-	101	●	401	●	601	●
12	30	102	0.08	-	-	-	-	121	●	421	●	621	●
16	35	115	0.09	-	-	-	-	161	●	461	●	661	●
20	40	131	0.09	-	-	-	-	201	●	-	-	701	●

ATORN® = Prod. Gr. 1AC
ORION = Prod. Gr. 1AO

ATORN® HSSE 90° NC spotting drill, uncoated, extra-long for universal use up to 1300 N/mm²



Application:

For NC spot drilling on conventional and CNC machines on deep-seated or hard to reach components.




Advantage:

- short design with precise point geometry and chisel edge ensure form-true and reliable spot drilling
- 90° NC spotting drill for spot drilling and countersinking in a single action
- Extra length enables precision drilling even on components that are difficult to reach

Execution:

- Spiral-fluted design with relief grinding.

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11016035-205	40	20	10	12	10	70	80	80	50	40	30	20	10	20	10				

				Surface		Uncoated	
Tool holding device				f steel 1000 ● (mm/U)		HA parallel shank	
				11016... Ident. No.			
				035	●	045	●
3	10	80	0.04	035	●	045	●
4	12	100	0.05	055	●	065	●
5	15	120	0.05	065	●	085	●
6	20	140	0.06	085	●	105	●
8	25	140	0.07	105	●	125	●
10	25	170	0.08	125	●	165	●
12	30	170	0.08	165	●	205	●
16	35	200	0.09	205	●		
20	40	200	0.09				

Prod. Gr. 1AD

ORION® HSS 90° multifunctional tool for universal use up to 1300 N/mm²



Application:

For centring, drilling, countersinking, chamfering and peripheral milling.





Advantage:

- Universal point geometry ensures a broad range of uses
- TiNAlOX coating for increased service life requirements

Execution:

- Spiral-fluted design with grinding relief

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11022	50	30	12	20	18	80	90	90	60	50	40	30	10	30	10	10	10		

				f steel 700 ● (mm/U)		11022... Ident. No.	
				030	●	040	●
3	3	6	50	030	●	040	●
4	4	8	52	050	●	060	●
5	5	10	60	060	●	080	●
6	6	12	66	080	●	100	●
8	8	14	79	100	●	120	●
10	10	16	89	120	●	160	●
12	12	18	102				
16	16	24	115				

Prod. Gr. 1AO

ATORN® ORION® NC spotting drill solid carbide 120°

for universal use up to 1300 N/mm²



Application:
For NC spot drilling on CNC machines.

Execution:
▪ spiral-fluted design with relief grinding

Advantage:
▪ short design with precise point geometry and chisel edge ensure form-true and reliable spot drilling

- 120° NC spotting drill for exact centring for subsequent machining of holes (drastically reduces untrue running of the drill)
- Solid carbide cutting material for a broad range of uses and long service life in series production

Notes:
Ident. No. 530-701: Diameter <6 mm with HA shaft



Ident. No. 030-461



Ident. No. 530-701

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11017	70	60	40	30	25	180	200	150	130	80	70	50	20	70	20	20	20	4	
1101736 1-461	70	60	40	30	25	180	200	150	130	80	70	50	20	70	20	20	20	4	
11017530-701	70	60	40	30	25	WS-N	200	150	130	80	70	50	20	70	20	20	20	4	

				ATORN®		ATORN®		ATORN®		ORION®		ATORN®	
Surface				Uncoated		TiAlN plus		Uncoated		Uncoated		TiAlN plus	
Tool holding device				HA parallel shank		HA parallel shank		HB parallel shank		HB parallel shank		HB parallel shank	
f steel 1300 ● (mm/U)				11017... Ident. No.		11017... Ident. No.		11017... Ident. No.		11017... Ident. No.		11017... Ident. No.	
				0.03	030 ●	530 ●	-	-	-	-	-	-	-
3	12	46	0.03	040 ●	540 ●	-	-	-	-	-	-	-	-
4	12	55	0.03	050 ●	550 ●	-	-	-	-	-	-	-	-
5	14	62	0.04	-	-	-	-	061 ●	361 ●	561 ●	-	-	-
6	20	66	0.06	-	-	-	-	081 ●	381 ●	581 ●	-	-	-
8	25	79	0.06	-	-	-	-	101 ●	401 ●	601 ●	-	-	-
10	25	89	0.07	-	-	-	-	121 ●	421 ●	621 ●	-	-	-
12	30	102	0.08	-	-	-	-	161 ●	461 ●	661 ●	-	-	-
16	35	115	0.09	-	-	-	-	201 ●	-	701 ●	-	-	-
20	40	131	0.10	-	-	-	-	-	-	-	-	-	-

ATORN® = Prod. Gr. 1AC
ORION = Prod. Gr. 1AO



twist drill type U4
for universal use up to 1300 N/mm²

Application:

series and single-part production, in particular on CNC machines in the steel, stainless steel, non-ferrous metals, cast iron and special alloy material groups.

advantage:

- 4-surface cutting for drilling without centring
- universal application, thereby reducing tool costs to a minimum and increasing user flexibility
- innovative and high-quality coating technology ensures increased service life
- ideal for use on NC machines



	Ø	Cutting material	Nutzlänge	DIN	P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
11079	1.0-14.0 mm	HSSE	3xD	1897	●	●	●	●	●	●	○	
11086	1.0-14.0 mm	HSSE	3xD	1897	●	●	●	●	●	●	○	
11023	1.0-14.0 mm	HSSE	5xD	338	●	●	●	●	●	●	○	
11037	1.0-14.0 mm	HSSE	5xD	338	●	●	●	●	●	●	○	



twist drill type N
for universal use up to 1000 N/mm²

Application:

series and single-part production on conventional and CNC machines in the steel, non-ferrous metals, cast iron up to a strength of 1000 N/mm² material groups.

advantage:

- long-term proven cutting geometry: excellent all-round properties and precise cutting behaviour
- universal application: tool costs minimised and greater flexibility for the user



	Ø	Cutting material	Nutzlänge	DIN	P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
11020	0.3-20.0 mm	HSS	5xD	338	●	○			○	○		
11066	1.0-25.0 mm	HSS	5xD	338	●	○			○	○		
11022600-834	1.0-16.0 mm	HSS	5xD	338	●	○			○	○		
11031	1.0-13.0 mm	HSS	5xD	338	●	○			○	●		
11041	1.0-13.0 mm	HSS	5xD	338	●	○			○	○		
11040	2.0-16.0 mm	HSS	5xD	338	●	○			○	○		
11056	0.6-16.0 mm	HSS	10xD	340	●	○			○	○		
11059	1.0-13.0 mm	HSS	10xD	340	●	○			○	○		
11063	1.5-14.0 mm	HSS	20xD	1869	●	○			○	○		
11070	5.0-65.0 mm	HSS	5xD	345	●	○			○	○		
11071	10.0-60.0 mm	HSS	5xD	345	●	○			○	○		
11084	14.0-25.0 mm	HSS	10xD	345	●	●			○	○		



Twist drill type NV
For use in high-strength materials from 700 N/mm²

Application:

Series and single-part production on conventional and CNC machines for use in the steel, stainless steel, cast iron and special alloy material groups from a strength of 700 N/mm².

advantage:

- special geometry with reinforced core and increased thermal resistance
- use in high-strength materials owing to high cobalt content in cutting material



	Ø	Cutting material	Nutzlänge	DIN	P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
11052	1.0-20.0 mm	HSSE	3xD	1897	○	●	●	●		●	●	
11053	1.0-20.0 mm	HSSE	3xD	1897	○	●	●	●	○	●	○	
11026	1.0-13.0 mm	HSSE Co8	5xD	338	○	●	●	●	○	●	○	



Twist drill type TLP
for universal use up to 1300 N/mm²

Application:

Series and single-part production on conventional and CNC machines in the steel, (stainless steel), non-ferrous metals, cast iron and special alloy material groups up to a strength of 1300 N/mm².

advantage:

- deep hole profile with large chipping spaces for optimised chip removal with larger drilling depths without venting
- favourable removal of chips owing to high chipping space volume



	Ø	Cutting material	Nutzlänge	DIN	P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
11021	1.0-16.0 mm	HSS	5xD	338	●	○			●	●		
11027	1.0-16.0 mm	HSSE	5xD	338	●	●	●	○	●	●	○	
11033	1.0-15.0 mm	HSSE	5xD	338	●	●	●	○	●	●	○	
11055	1.0-14.0 mm	HSS	10xD	340	●	●			●	●		
11057	1.0-16.0 mm	HSSE	10xD	340	●	●	●	○	●	●	○	
11060	1.0-12.0 mm	HSSE	10xD	340	●	●	●	○	●	●	○	
11061	2.0-10.0 mm	HSS	15xD	1869	●	○			●	●		
11085	8.0-25.0 mm	HSS	10xD	345	●	●			●	○		



Twist drill type VA
For use in stainless steel and special alloys

Application:

Series and single-part production on conventional and CNC machines in the stainless steel, special alloy and (steel) material groups up to a strength of 1300 N/mm².

advantage:

- special geometry with aggressive cutter design and free geometry for very smooth cutting in stainless steel and special alloys
- long service life owing to increased cobalt content





	Ø	Cutting material	Nutzlänge	DIN	P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
11028	1.0-13.0 mm	HSSE	5xD	338	○	○	○	●	○		●	
11029	0.3-16.0 mm	HSSE	5xD	338	○	○	○	●	○		●	
11058	1.0-12.0 mm	HSSE	10xD	340	○	○	○	●	○		●	
11074	11.0-23.0 mm	HSSE	5xD	345	○	○	○	●	○		●	

i **Twist drill type X**
for universal use up to 1300 N/mm²

Application:

Series and single-part production on conventional and CNC machines in the steel, stainless steel, non-ferrous metals, cast iron and special alloy material groups up to a strength of 1300 N/mm².

advantage:

- very high wear resistance and heat resistance owing to high-quality HSSE-PM cutting material
- high cutting edge stability owing to special point thinning and cutting angle adjustment
- very long service life in higher-alloyed steels and materials



	Ø	Cutting material	Nutzlänge	DIN	P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
11080	1.0-14.0 mm	HSSE-PM	3xD	1897	●	●	●	●	●	●	○	
11025	1.0-14.0 mm	HSSE-PM	5xD	338	●	●	●	●	●	●	○	

i **twist drill type UNI/VA HSSE V3**
for high-strength and stainless steel processing

application:

problem solver on conventional machines without internal cooling in the following material groups: steel, stainless steel and high-strength materials

advantage:

- special geometry in conjunction with HSSE-V3 cutting material makes the drill the ultimate problem solver
- very high cutting speeds achievable
- very long service life in high-alloyed steels and stainless steels
- for low-performance machines without internal cooling in stainless steel



i **micro twist drill HSSE-PM**
for universal use up to 1300 N/mm²

Application:

for machining micro holes up to a strength of 1300 N/mm².

advantage:

- high-quality HSSE PM cutting material provides maximum toughness and is therefore less susceptible to breakage
- diameter from 0.05 mm–1.50 mm
- cost-effective alternative to solid carbide range



	Ø	Cutting material	Nutzlänge	DIN	P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
11054	0.05-1.5 mm	HSSE-PM	5xD	1899	●	●	●	●	●	●	○	



Multi-twist drill

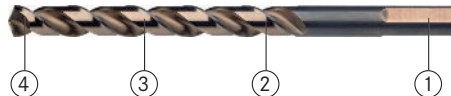
Straight shank with 3-surface cut

Application:

The multi-twist drill was specially developed for mobile use on cordless drill screwdrivers (plates up to 5 mm) and electronic drills.

advantage:

- Three-faced polished section on the shank ensures optimum power transmission and fastening in drill chuck. Slippage is a thing of the past. Less effort when opening or closing in drill chuck.
- 40° twist angle ensures reliable removal of chippings during universal use. Higher cutting speeds with increased stability and accuracy.
- Special coating in connection with relief grinding provides for maximum adhesion of the lubricant and reliable chip removal.
- In the case of hand-held applications with a cordless drill screwdriver in particular, the 135° tip angle provides for a very high precision of the bore hole, a reduced cutting edge (extension of the battery life) and optimum centring precision, thanks to the innovative centre grinding.



	∅	Cutting material	Nutzlänge	DIN	P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
11032020-130	2.0-13.0 mm	HSSE	5xD	338	●	●	○	●	●	○	○	



Twist drill with soldered cemented carbide cutting insert

Application:

series and single-part production on conventional and CNC machines.

advantage:

- polished chipping space ensures favourable chip removal
- cemented carbide cutting insert K20 ensures long service life
- ideal where high elasticity with high wear resistance is required
- excellent price/performance ratio



	∅	Schneidstoff	Max. drilling depth (D)	DIN	P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	H 65HRC	
11160	1.5-20.0 mm	Carbide	4xD	8037	●	●	●	○	○	●	○		
11162	3.0-12.0 mm	Carbide	4xD	8037								●	
11163	13.0-30.0 mm	Carbide	4xD	8041	●	●	●	○	○	●	○		

ORION[®] Twist drill type N HSS 5xD (DIN 338) for universal use up to 1000 N/mm²



No. 11031



No. 11041

Application:

Standard geometry for universal use up to 1000 N/mm².

Execution:

- Twist drill with universal standard geometry

Advantage:

- excellent all-round properties and precise cutting pattern
- universal use: minimises tool costs and improves flexibility

- No. 11031:** TiN coating for increased service life requirements
- No. 11041:** Vaporisation ensures favourable adherence of coolant

Delivery:

box quantity: drill Ø 1.0–6.0 mm = 10 units (price per unit)

Notes:

No. 11041: steam-treated drill Ø >2.4 mm

Application No.	Steel (N/mm ²)		Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GJMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short							long	<55 HRC	<65 HRC
11031	40	20		10		50	45	40	35	40	30	20	10	30	10				
11041	30	20		10		50	45	40	35	40	30	20	10	25					

Cutting material Surface				HSS TiN		HSS Vaporised	
f steel 700 (mm/U)	11031... Ident. No.			11041... Ident. No.			
1	12	34	0.03	081	081		
1.1	14	36	0.04	091	091		
1.2	16	38	0.04	101	101		

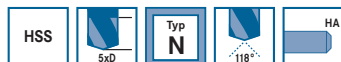
Cutting material Surface				HSS TiN		HSS Vaporised	
f steel 700 (mm/U)	11031... Ident. No.			11041... Ident. No.			
1.3	16	38	0.04	111	111		
1.4	18	40	0.04	121	121		
1.5	18	40	0.04	131	131		

Cutting material Surface				HSS TiN		HSS Vaporised	
f steel 700 (mm/U)	11031... Ident. No.			11041... Ident. No.			
1.6	20	43	0.04	141	141		
1.7	20	43	0.04	151	151		
1.8	22	46	0.04	161	161		
1.9	22	46	0.05	171	171		
2	24	49	0.05	181	181		
2.1	24	49	0.05	192	192		
2.2	27	53	0.05	202	202		
2.3	27	53	0.05	210	210		
2.4	30	57	0.05	220	220		
2.5	30	57	0.05	230	230		
2.6	30	57	0.06	240	240		
2.7	33	61	0.06	250	250		
2.8	33	61	0.06	260	260		
2.9	33	61	0.06	270	270		
3	33	61	0.06	280	280		
3.1	36	65	0.06	282	282		
3.2	36	65	0.07	286	286		
3.3	36	65	0.07	289	289		
3.4	39	70	0.07	291	291		
3.5	39	70	0.07	293	293		
3.6	39	70	0.08	296	296		
3.7	39	70	0.08	299	299		
3.8	43	75	0.08	302	302		
3.9	43	75	0.09	305	305		
4	43	75	0.09	310	310		
4.1	43	75	0.09	314	314		
4.2	43	75	0.09	316	316		
4.3	47	80	0.1	319	319		
4.4	47	80	0.1	324	324		
4.5	47	80	0.1	326	326		
4.6	47	80	0.11	329	329		
4.7	47	80	0.11	332	332		
4.8	52	86	0.11	335	335		
4.9	52	86	0.11	337	337		
5	52	86	0.12	341	341		
5.1	52	86	0.12	344	344		
5.2	52	86	0.12	349	349		
5.3	52	86	0.12	352	352		
5.4	57	93	0.13	355	355		
5.5	57	93	0.13	358	358		
5.6	57	93	0.13	361	361		
5.7	57	93	0.14	364	364		
5.8	57	93	0.14	367	367		
5.9	57	93	0.14	369	369		
6	57	93	0.14	371	371		
6.1	63	101	0.15	373	373		
6.2	63	101	0.15	375	375		

Cutting material Surface				HSS TiN		HSS Vaporised	
f steel 700 (mm/U)	11031... Ident. No.			11041... Ident. No.			
6.3	63	101	0.15	377	377		
6.4	63	101	0.16	379	379		
6.5	63	101	0.16	381	381		
6.6	63	101	0.16	383	383		
6.7	63	101	0.16	385	385		
6.8	69	109	0.17	387	387		
6.9	69	109	0.17	389	389		
7	69	109	0.17	391	391		
7.1	69	109	0.18	393	393		
7.2	69	109	0.18	396	396		
7.3	69	109	0.18	398	398		
7.4	69	109	0.18	400	400		
7.5	69	109	0.19	402	402		
7.6	75	117	0.19	405	405		
7.7	75	117	0.19	407	407		
7.8	75	117	0.19	409	409		
7.9	75	117	0.2	411	411		
8	75	117	0.2	414	414		
8.1	75	117	0.2	416	416		
8.2	75	117	0.2	418	418		
8.3	75	117	0.2	420	420		
8.4	75	117	0.2	423	423		
8.5	75	117	0.21	425	425		
8.6	81	125	0.21	427	427		
8.7	81	125	0.21	429	429		
8.8	81	125	0.21	432	432		
8.9	81	125	0.21	434	434		
9	81	125	0.21	436	436		
9.1	81	125	0.21	438	438		
9.2	81	125	0.21	441	441		
9.3	81	125	0.21	443	443		
9.4	81	125	0.21	445	445		
9.5	81	125	0.22	447	447		
9.6	87	133	0.22	450	450		
9.7	87	133	0.22	452	452		
9.8	87	133	0.22	454	454		
9.9	87	133	0.22	456	456		
10	87	133	0.22	459	459		
10.2	87	133	0.22	461	461		
10.5	87	133	0.23	466	466		
10.75	94	142	0.23	-	470		
11	94	142	0.23	473	473		
11.5	94	142	0.24	480	480		
11.75	94	142	0.24	-	484		
12	101	151	0.24	488	488		
12.5	101	151	0.25	494	494		
13	101	151	0.25	500	500		

Prod. Gr. 1AP

ORION® Twist drill type N HSS 5xD, roll forged (DIN 338)
for universal use up to 1000 N/mm²



Application:
for drilling on hand-guided drills and CNC machines.

Execution:
▪ Twist drill with universal standard geometry, roll forged

Advantage:
▪ excellent all-round properties and precise cutting pattern

- vaporisation ensures favourable adherence of coolant
- the drill is perfectly suited to machining on hand-operated machines due to its high degree of resilience
- very economical tool

Delivery:
packing unit: drill bits up to Ø10, 20 mm = 10 pieces (price per piece)

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GJMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11040	30	20		10		50	45	40	35	40	30	20	10	25					

Cutting material Surface				HSS Vaporised	
mm	mm	mm	f steel 700 (mm/U)	11040... Ident. No.	
2	24	49	0.05	181	●
2.1	24	49	0.05	192	●
2.2	27	53	0.05	202	●
2.3	27	53	0.05	210	●
2.4	30	57	0.05	220	●
2.5	30	57	0.05	230	●
2.6	30	57	0.06	240	●
2.7	33	61	0.06	250	●
2.8	33	61	0.06	260	●
2.9	33	61	0.06	270	●
3	33	61	0.06	280	●

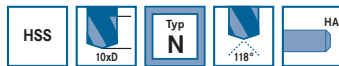
Cutting material Surface				HSS Vaporised	
mm	mm	mm	f steel 700 (mm/U)	11040... Ident. No.	
3.1	36	65	0.06	282	●
3.2	36	65	0.07	286	●
3.3	36	65	0.07	289	●
3.4	39	70	0.07	291	●
3.5	39	70	0.07	293	●
3.6	39	70	0.08	296	●
3.7	39	70	0.08	299	●
3.8	43	75	0.08	302	●
3.9	43	75	0.09	305	●
4	43	75	0.09	310	●
4.1	43	75	0.09	314	●

Cutting material Surface				HSS Vaporised	
mm	mm	mm	f steel 700 (mm/U)	11040... Ident. No.	
4.2	43	75	0.09	316	●
4.3	47	80	0.1	319	●
4.4	47	80	0.1	324	●
4.5	47	80	0.1	326	●
4.6	47	80	0.11	329	●
4.7	47	80	0.11	332	●
4.8	52	86	0.11	335	●
4.9	52	86	0.11	337	●
5	52	86	0.12	341	●
5.1	52	86	0.12	344	●
5.2	52	86	0.12	349	●
5.3	52	86	0.12	352	●
5.4	57	93	0.13	355	●
5.5	57	93	0.13	358	●
5.6	57	93	0.13	361	●
5.7	57	93	0.14	364	●
5.8	57	93	0.14	367	●
5.9	57	93	0.14	369	●
6	57	93	0.14	371	●
6.1	63	101	0.15	373	●
6.2	63	101	0.15	375	●
6.3	63	101	0.15	377	●
6.4	63	101	0.16	379	●
6.5	63	101	0.16	381	●
6.6	63	101	0.16	383	●
6.7	63	101	0.16	385	●
6.8	69	109	0.17	387	●
6.9	69	109	0.17	389	●
7	69	109	0.17	391	●
7.1	69	109	0.18	393	●
7.2	69	109	0.18	396	●
7.3	69	109	0.18	398	●
7.4	69	109	0.18	400	●
7.5	69	109	0.19	402	●
7.6	75	117	0.19	405	●
7.7	75	117	0.19	407	●
7.8	75	117	0.19	409	●

Cutting material Surface				HSS Vaporised	
mm	mm	mm	f steel 700 (mm/U)	11040... Ident. No.	
7.9	75	117	0.2	411	●
8	75	117	0.2	414	●
8.1	75	117	0.2	416	●
8.2	75	117	0.2	418	●
8.3	75	117	0.2	420	●
8.4	75	117	0.2	423	●
8.5	75	117	0.21	425	●
8.6	81	125	0.21	427	●
8.7	81	125	0.21	429	●
8.8	81	125	0.21	432	●
8.9	81	125	0.21	434	●
9	81	125	0.21	436	●
9.1	81	125	0.21	438	●
9.2	81	125	0.21	441	●
9.3	81	125	0.21	443	●
9.4	81	125	0.21	445	●
9.5	81	125	0.22	447	●
9.6	87	133	0.22	450	●
9.7	87	133	0.22	452	●
9.8	87	133	0.22	454	●
9.9	87	133	0.22	456	●
10	87	133	0.22	459	●
10.2	87	133	0.22	461	●
10.5	87	133	0.23	466	●
11	94	142	0.23	473	●
11.5	94	142	0.24	480	●
11.75	94	142	0.24	484	●
12	101	151	0.24	488	●
12.25	101	151	0.24	491	●
12.5	101	151	0.25	494	●
13	101	151	0.25	500	●
13.5	108	160	0.26	507	●
14	108	160	0.26	514	●
14.5	114	169	0.27	521	●
15	114	169	0.27	528	●
15.5	120	178	0.28	536	●
16	120	178	0.28	543	●

Prod. Gr. 1AP

ATORN® ORION® Twist drill type N HSS 10xD (DIN 340)
for universal use up to 1000 N/mm²



Application:

Standard geometry for universal use up to 1000 N/mm².

▪ universal use: minimises tool costs and improves flexibility

▪ Vaporisation ensures favourable adherence of coolant

Execution:

▪ Twist drill with universal standard geometry

Delivery:

Packaging unit: drill Ø 1.0-6.0 mm = 10 pieces (price per piece)

Advantage:

▪ excellent all-round properties and precise cutting pattern

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze	Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long								short	long
11056	30	20		10		40	60	50	35	30	20	20	10	25				
11059	30	20		10		40	60	50	35	30	20	20	10	25				




Cutting material Surface				ATORN®		ORION®	
Surface				HSS Vaporised		HSS Vaporised	
mm	mm	mm	f steel 700 (mm/U)	11056... Ident. No.		11059... Ident. No.	
0.6	15	35	0.03	006	●	-	-
0.8	29	46	0.03	008	●	-	-
1	33	56	0.03	030	●	030	●
1.1	37	60	0.04	031	●	-	-
1.2	41	65	0.04	033	●	-	-
1.3	41	65	0.04	035	●	-	-
1.4	45	70	0.04	037	●	-	-
1.5	45	70	0.04	039	●	039	●
1.6	50	76	0.04	042	●	-	-
1.7	50	76	0.04	044	●	-	-
1.8	53	80	0.04	046	●	-	-
1.9	53	80	0.05	048	●	-	-
2	56	85	0.05	051	●	051	●
2.1	56	85	0.05	053	●	-	-
2.2	59	90	0.05	055	●	-	-
2.3	59	90	0.05	057	●	-	-
2.4	62	95	0.05	060	●	-	-
2.5	62	95	0.05	062	●	062	●

Cutting material Surface				ATORN®		ORION®	
Surface				HSS Vaporised		HSS Vaporised	
mm	mm	mm	f steel 700 (mm/U)	11056... Ident. No.		11059... Ident. No.	
2.6	62	95	0.06	064	●	-	-
2.7	66	100	0.06	066	●	-	-
2.8	66	100	0.06	069	●	-	-
2.9	66	100	0.06	071	●	-	-
3	66	100	0.06	073	●	073	●
3.1	69	106	0.06	075	●	-	-
3.2	69	106	0.07	078	●	-	-
3.3	69	106	0.07	080	●	080	●
3.4	73	112	0.07	082	●	-	-
3.5	73	112	0.07	084	●	084	●
3.6	73	112	0.08	087	●	-	-
3.7	73	112	0.08	089	●	-	-
3.8	78	119	0.08	091	●	-	-
3.9	78	119	0.09	093	●	-	-
4	78	119	0.09	096	●	096	●
4.1	78	119	0.09	098	●	-	-
4.2	78	119	0.09	100	●	100	●
4.3	82	126	0.1	102	●	-	-

Cutting material Surface				ATORN®		ORION®	
Surface				HSS Vaporised		HSS Vaporised	
mm	mm	mm	f steel 700 (mm/U)	11056... Ident. No.		11059... Ident. No.	
4.5	82	126	0.1	107	●	107	●
4.6	82	126	0.11	109	●	-	-
4.7	82	126	0.11	111	●	-	-
4.8	87	132	0.11	114	●	-	-
4.9	87	132	0.11	116	●	-	-
5	87	132	0.12	118	●	118	●
5.1	87	132	0.12	119	●	-	-
5.2	87	132	0.12	121	●	-	-
5.3	87	132	0.12	123	●	-	-
5.4	91	139	0.13	124	●	-	-
5.5	91	139	0.13	125	●	125	●
5.6	91	139	0.13	127	●	-	-
5.7	91	139	0.14	128	●	-	-
5.8	91	139	0.14	130	●	-	-
5.9	91	139	0.14	131	●	-	-
6	91	139	0.14	133	●	133	●
6.1	97	148	0.15	134	●	-	-
6.2	97	148	0.15	135	●	-	-
6.3	97	148	0.15	137	●	-	-
6.4	97	148	0.16	139	●	-	-
6.5	97	148	0.16	140	●	140	●
6.6	97	148	0.16	141	●	-	-
6.7	97	148	0.16	142	●	-	-
6.8	102	156	0.17	144	●	-	-

Cutting material Surface				ATORN®		ORION®	
Surface				HSS Vaporised		HSS Vaporised	
mm	mm	mm	f steel 700 (mm/U)	11056... Ident. No.		11059... Ident. No.	
7	102	156	0.17	146	●	146	●
7.5	102	156	0.19	153	●	153	●
7.7	109	165	0.19	156	●	-	-
7.8	109	165	0.19	158	●	-	-
8	109	165	0.2	161	●	161	●
8.1	109	165	0.2	162	●	-	-
8.2	109	165	0.2	163	●	-	-
8.4	109	165	0.2	167	●	-	-
8.5	109	165	0.21	168	●	168	●
9	115	175	0.21	175	●	175	●
9.5	115	175	0.22	182	●	-	-
9.8	121	184	0.22	187	●	-	-
10	121	184	0.22	190	●	-	-
10.2	121	184	0.22	192	●	-	-
10.5	121	184	0.23	197	●	-	-
11	128	197	0.23	204	●	-	-
11.5	128	197	0.24	207	●	-	-
12	134	205	0.24	211	●	-	-
12.5	134	205	0.25	214	●	-	-
13	134	205	0.25	217	●	217	●
13.5	140	214	0.26	221	●	-	-
14	140	214	0.26	224	●	-	-
15	144	220	0.27	230	●	-	-
16	149	227	0.28	235	●	-	-

ATORN® = Prod. Gr. 1AA
ORION® = Prod. Gr. 1AP

				ATORN®		ORION®						ATORN®		ORION®	
Cutting material				HSSE		HSSE		Cutting material				HSSE		HSSE	
Surface				Uncoated		Uncoated		Surface				Uncoated		Uncoated	
f steinl. st. (mm/U)				11029... Ident. No.		11028... Ident. No.		f steinl. st. (mm/U)				11029... Ident. No.		11028... Ident. No.	
															
mm	mm	mm													
13.5	108	160	0.15	507	●	-	-	15	114	169	0.17	528	●	-	-
14	108	160	0.15	514	●	-	-	15.5	120	178	0.17	536	●	-	-
14.5	114	169	0.15	521	●	-	-	16	120	178	0.17	543	●	-	-

ORION = Prod. Gr. 102
 ATORN® = Prod. Gr. 112

ORION® Twist drill set HSS/E 5xD (DIN 338)
 In metal or plastic box



No. 11043 011, 11044 011, 11047 011, 11050 011
 D = 1.0-5.9 mm, increasing by 0.1 mm



No. 11043 021, 11044 021, 11047 021, 11050 021
 D = 6.0-10.0 mm, increasing by 0.1 mm



No. 11043 051, 11044 051, 11047 051, 11050 051
 D = 1.0-10.0 mm, increasing by 0.5 mm



No. 11043 061, 11044 061, 11047 061, 11050 061
 D = 1.0-10.5 mm, increasing by 0.5 mm



No. 11043 071, 11044 071, 11047 071, 11050 071
 D = 1.0-13.0 mm, increasing by 0.5 mm



No. 11043 081, 11044 081, 11047 081, 11050 081
 D = 1.0-10.0 mm, increasing by 0.1 mm

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11043011-081	30	20		10		40	60	70	45	40	30	20	10	25					
11044011-081	30	20		10		50	45	40	35	40	30	20	10	25					
11047011-081	40	20	10	10		50	45	40	35	40	30	20	10	30	10				
11050011-081	30	20	10	15	10	50	70	45	35	40	30				7	6	6		

Composition of set	Pitch of drill Ø	Number of pieces in assortment/set (PCS)	Surface		Vaporised		Vaporised		TiN		Uncoated	
			Type	N (no. 11040)	Type	N (no. 11041)	Type	N (no. 11031)	Type	VA (no. 11028)		
1,0-5,9	0.1 mm	50	11043... Ident. No.	011	●	011	●	011	●	011	●	011
6,0-10,0	0.1 mm	41	021	●	021	●	021	●	021	●	021	●
1,0-10,0	0.5 mm	19	051	●	051	●	051	●	051	●	051	●
1,0-10,5	0.5 mm + core-hole drill	24	061	●	061	●	061	●	061	●	061	●
1,0-13,0	0.5 mm	25	071	●	071	●	071	●	071	●	071	●
1,0-10,0	0.1 mm	91	081	●	081	●	081	●	081	●	081	●

11043... = Prod. Gr. 1AP
 11044... = Prod. Gr. 1AP
 11047... = Prod. Gr. 1AP
 11050... = Prod. Gr. 102

ATORN® ORION® Twist drill set HSS/HSSE 5xD
 Without box



		ATORN®		ORION®		ORION®	
Surface		Vaporised		Vaporised		TiN	
Cutting material		HSS		HSS		HSS	
Type		N (no. 11020)		N (no. 11040)		N (no. 11031)	
Composition of set	Pitch of drill Ø	11042... Ident. No.		11043... Ident. No.		11047... Ident. No.	
1,0-5,0	0.1 mm	010	●	010	●	010	●
5,1-10,0	0.1 mm	020	●	020	●	-	-
1,0-10,0	0.5 mm	050	●	050	●	-	-
1,0-10,5	0.5 mm + core-hole drill	060	●	060	●	-	-
1,0-13,0	0.5 mm	070	●	070	●	070	●



No. 11042-11043



No. 11047

ORION = Prod. Gr. 1AP
 ATORN® = Prod. Gr. 112

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11042010-070	30	20		10		50	45	40	35	40	30	20	10	25					
11043010-070	30	20		10		50	45	40	35	40	30	20	10	25					
11047010-070	40	20	10	10		50	45	40	35	40	30	20	10	30	10				

ATORN® ORION® Twist drill type N HSS with offset shank for universal use up to 1000 N/mm²



Application:

Standard geometry for universal use up to 1000 N/mm².

Execution:

- Twist drill with universal standard geometry

Advantage:

- excellent all-round properties and precise cutting pattern
- Steam treatment ensures favourable adherence of coolant
- Diameter-independent straight shank of uniform length for clamping and tool advantages
- No. 11068:** Inexpensive tool, very good value for money

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11067	30	20	10	10	8	40	60	50	30	30	20	20	10	20	4				
11068	30	20	10	10	8	40	60	50	30	30	20	20	10	20	4				

						ATORN®		ORION®	
mm	mm	mm	Shaft Ø (mm)	f steel 700 ● (mm/U)	Ident. No.		Ident. No.		
13.5	76	152	12.7	0.26	135	●	135	●	
14	76	152	12.7	0.26	140	●	140	●	
14.5	76	152	12.7	0.27	145	●	145	●	
15	76	152	12.7	0.27	150	●	150	●	
15.5	76	152	12.7	0.28	155	●	155	●	
16	76	152	12.7	0.28	160	●	160	●	

						ATORN®		ORION®	
mm	mm	mm	Shaft Ø (mm)	f steel 700 ● (mm/U)	Ident. No.		Ident. No.		
16.5	76	152	12.7	0.28	165	●	165	●	
17	76	152	12.7	0.29	170	●	170	●	
17.5	76	152	12.7	0.29	175	●	175	●	
18	76	152	12.7	0.3	180	●	180	●	
18.5	76	152	12.7	0.3	185	●	185	●	
19	76	152	12.7	0.3	190	●	190	●	
19.5	76	152	12.7	0.31	195	●	195	●	
20	76	152	12.7	0.31	200	●	200	●	
21	76	152	12.7	0.32	210	●	210	●	
22	76	152	12.7	0.33	220	●	220	●	
23	76	152	12.7	0.33	230	●	230	●	
24	76	152	12.7	0.34	240	●	240	●	
25	76	152	12.7	0.35	250	●	250	●	

ATORN® = Prod. Gr. 1AA
ORION = Prod. Gr. 1AP

ORION® HSS Subland stepped drill bit type N (DIN 8378)

For thread core hole with countersink



Application:

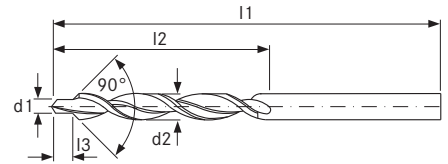
For thread core holes in accordance with DIN 336 and 90° free countersink equivalent to through holes in accordance with DIN EN 20273. Countersink and thread core holes are manufactured in one machining step.

Execution:

- Drill and countersink step with independent chip grooves and drill heels; regrinding does not affect the profile

Advantage:

- precise alignment of drill diameter and countersink diameter, lower process costs
- universal use, therefore tool costs are reduced to a minimum and user flexibility is increased



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11106	30	20				40	50	40	35	20	15			20					

Suitable for screw thread	d1 (mm)	d2 (mm)	l3 (mm)	l2 (mm)	l1 (mm)	Shaft Ø (mm)	f steel 700 (mm/U)	11106... Ident. No.
M3	2.5	3.4	8.8	39	70	3.4	0.03	003 ●
M4	3.3	4.5	11.4	47	80	4.5	0.04	004 ●
M5	4.2	5.5	13.6	57	93	5.5	0.06	005 ●
M6	5	6.6	16.5	63	101	6.6	0.08	006 ●
M8	6.8	9	21	81	125	9	0.1	008 ●

Prod. Gr. 1AR

ORION® HSS Subland stepped drill bit type N, fine quality grade (DIN 8374)

For 90° countersunk screws



Application:

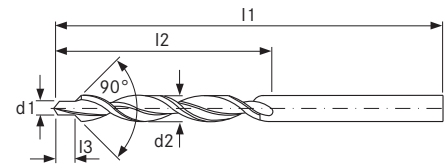
For through holes in accordance with DIN EN 20273 and screw head countersinking 90°.

Execution:

- Drill and countersink step with independent chip grooves and drill heels; regrinding does not affect the profile

Advantage:

- precise alignment of drill diameter and countersink diameter, lower process costs
- universal use, therefore tool costs are reduced to a minimum and user flexibility is increased



p. 206

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11100	30	20				40	50	40	35	20	15			20					

Suitable for screw thread	d1 (mm)	d2 (mm)	l3 (mm)	l2 (mm)	l1 (mm)	Shaft Ø (mm)	f steel 1000 (mm/U)	11100... Ident. No.
M3	3.2	6	9	57	93	6	0.15	003 ●
M4	4.3	8	11	75	117	8	0.18	004 ●
M5	5.3	10	13	87	133	10	0.2	005 ●
M6	6.4	11.5	15	94	142	11.5	0.21	006 ●
M8	8.4	15	19	114	169	15	0.23	008 ●

Prod. Gr. 1AR

ORION® HSS Subland stepped drill bit type N, medium quality grade (DIN

8374)



For 90° countersunk screws

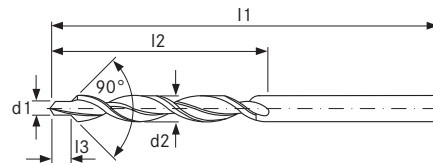


Application:

For through holes in accordance with DIN EN 20273 and 90° countersunk screw heads, form A and B, in accordance with DIN 74. For screws in accordance with DIN 963 and 964.

Advantage:

- precise alignment of drill diameter and countersink diameter, lower process costs
- universal use, therefore tool costs are reduced to a minimum and user flexibility is increased



Execution:

- Drill and countersink step with independent chip grooves and drill heels; regrinding does not affect the profile

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	>65 HRC	
11101	30	20				40	50	40	35	20	15			20						
Suitable for screw thread	d1 (mm)		d2 (mm)		l3 (mm)		l2 (mm)		l1 (mm)		Shaft Ø (mm)		f steel 700 (mm/U)		11101... Ident. No.					
M3	3.4		6.6		9		63		101		6.6		0.05		003					
Suitable for screw thread	d1 (mm)		d2 (mm)		l3 (mm)		l2 (mm)		l1 (mm)		Shaft Ø (mm)		f steel 700 (mm/U)		11101... Ident. No.					
M4	4.5		9		11		81		125		9		0.07		004					
M5	5.5		11		13		94		142		11		0.08		005					
M6	6.6		13		15		101		151		13		0.09		006					
M8	9		17.2		19		130		191		17.2		0.1		008					

Prod. Gr. 1AR

i Stepped drill bit for 180° countersunk screw heads



Application:

series and single-part production on conventional and CNC machines.

advantage:

- high profitability as drill hole and 180° counterbore produced in single work step
- precise alignment of drill diameter and countersink diameter

ORION HSS Subland stepped drill bit type N, medium quality grade (DIN 8376)



For 180° cylinder head screws



Application:

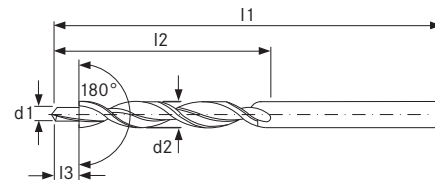
For through holes in accordance with DIN EN 20273 and screw head countersinking 180° in accordance with DIN 974-1, series 1. For screws in accordance with DIN 6912, 7984, 34821, DIN EN ISO 1207, 4762, 14579, 14580

Execution:

- Drill and countersink step with independent chip grooves and drill heels; regrinding does not affect the profile

Advantage:

- precise alignment of drill diameter and countersink diameter, lower process costs
- universal use, therefore tool costs are reduced to a minimum and user flexibility is increased



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
11112	30	20				40	50	40	35	20	15			20						

Suitable for screw thread	d1 (mm)	d2 (mm)	l3 (mm)	l2 (mm)	l1 (mm)	Shaft Ø (mm)	f steel 700 (mm/U)	11112... Ident. No.	
M3	3.4	6	9	57	93	6	0.03	003	●
M4	4.5	8	11	75	117	8	0.04	004	●
M5	5.5	10	13	87	133	10	0.05	005	●
M6	6.6	11	15	94	142	11	0.07	006	●
M8	9	15	19	114	169	15	0.08	008	●
M10	11	18	23	130	191	18	0.1	010	●

Prod. Gr. 1AR

ORION HSS Subland stepped drill bit type N, medium quality grade (DIN 8377)



For 180° cylinder head screws



Application:

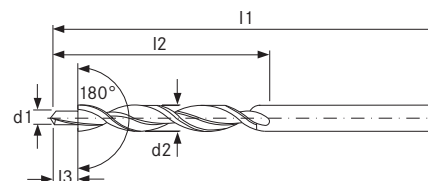
For through holes in accordance with DIN EN 20273 and screw head countersinking 180° in accordance with DIN 974-1, series 1. For screws in accordance with DIN 6912, 7984, 34821, DIN EN ISO 1207, 4762, 14579, 14580

Execution:

- Drill and countersink step with independent chip grooves and drill heels; regrinding does not affect the profile

Advantage:

- precise alignment of drill diameter and countersink diameter, lower process costs
- universal use, therefore tool costs are reduced to a minimum and user flexibility is increased



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11115	30	20				40	50	40	35	20	15			20					

Suitable for screw thread	d1 (mm)	d2 (mm)	l3 (mm)	l2 (mm)	l1 (mm)	Morse taper size	f steel 700 (mm/U)	11115... Ident. No.	
M6	6.6	11	15	94	175	MK 1	0.1	006	●
M8	9	15	19	114	212	MK 2	0.12	008	●
M10	11	18	23	130	228	MK 2	0.13	010	●
M12	13.5	20	27	140	238	MK 2	0.16	012	●
M16	17.5	26	35	165	286	MK 3	0.18	016	●

Prod. Gr. 1AR



troubleshooting for solid carbide/HSSE drills

flank wear

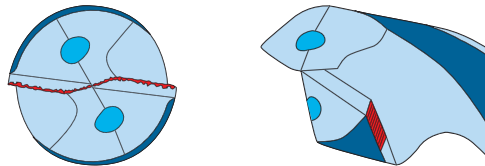
flank wear is the preferred type of wear, if it is even.

problem

- cutting speed too high
- oil content in coolant too low
- cooling inadequate
- concentricity error

counter-measures

- reduce cutting speed
- increase oil content in coolant
- increase coolant quantity
- check concentricity



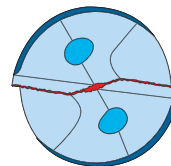
flank wear on chisel edge

problem

- cutting speed too low
- feed rate too high
- concentricity error

counter-measure

- reduce cutting speed
- reduce feed rate
- check concentricity



the hole quality decreases, since the self-centring capability is no longer guaranteed.

chipping

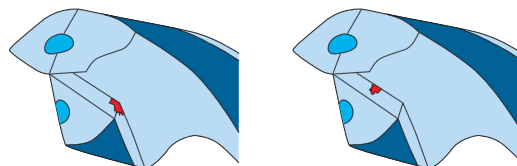
chipping occurs mainly when machining pre-drilled holes, when the tip angle of the pilot hole is smaller.

problem

- tip angles do not match each other
- unstable conditions
- concentricity error
- cooling inadequate

counter-measure

- check tip angles
- check clamping
- check concentricity
- increase cooling



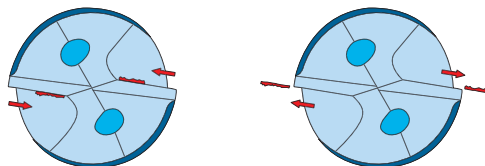
built-up edges

problem

- cutting speed too high/too low
- oil content in coolant too low

counter-measure

- increase cutting speed so that the build-up edge moves to the middle
- reduce cutting speed so that the built-up edge moves to the exterior or is avoided
- increase oil content in coolant



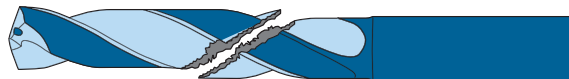
drill breakage

problem

- cutting speed too low
- unstable conditions
- concentricity error
- feed rate too high
- chips building up

counter-measure

- increase cutting speed
- check clamping
- check concentricity
- reduce feed rate
- increase cooling





i **ORION high-performance indexable inserts drill**
for universal use up to 1300 N/mm²




application:

- high-performance drilling in the diameter range 8.00–40.00 mm
- in drilling depths 3xD / 5xD / 7xD
- simple replacement of cutting inserts even in the machine tool. this reduces ancillary and production costs.
- the tool body is supplied with clamping screws
- universal geometry for steel, cast iron and non-ferrous metals
- low cutting forces and excellent self-centring capability



advantage:

- high-quality backing materials produced from high-strength and heat-resistant powder metal ensure perfectly aligned and true-to-size drilling, even in difficult cutting conditions
- high-precision H6 shaft tolerance
- polished flutes ensure seamless and reliable chip removal even in long-chipping materials
- regrinding no longer required
- simple indexable insert replacement in the machine
- incremental dimensions from 0.1 mm upwards available on request

11213080-115	Indexable insert drill 3xD for universal use up to 1300 N/mm ² , in diameter range of 8.00–40.00 mm	
11215080-115	Indexable insert drill 5xD for universal use up to 1300 N/mm ² , in diameter range of 8.00–40.00 mm	
11217080-115	Indexable insert drill 7xD for universal use up to 1300 N/mm ² , in diameter range of 8.00–40.00 mm	

i **WALTER Star Drill high-performance drill with indexable inserts**
in drilling depths 3xD-7xD




application:

- high performance drilling with indexable inserts drilling depth 2xD 4xD
- for universal use up to 1300 N/mm² in the diameter range from 16.00 mm to 58.00 mm
- for average requirements in terms of finish quality and tolerance
- different cutting grades and chip shape geometries for machining steel, cast iron, stainless steel and special alloys



advantage:

- ideal as a standing tool for the lathe, can also be used as a core drilling and chamfering tool
- very stable due to the straight groove shape
- inner and outer plates have same geometry

11202	Stardrill indexable insert drill 2xD For universal application up to 1300 N/mm ² , in diameter range of 16.00 mm to 58.00 mm	
11203160-580	Stardrill indexable insert drill 3xD For universal application up to 1300 N/mm ² , in diameter range of 10.00 mm to 58.00 mm	
11204	Star Drill indexable insert drill 4xD For universal application up to 1300 N/mm ² , in diameter range of 10.00 mm to 58.00 mm	



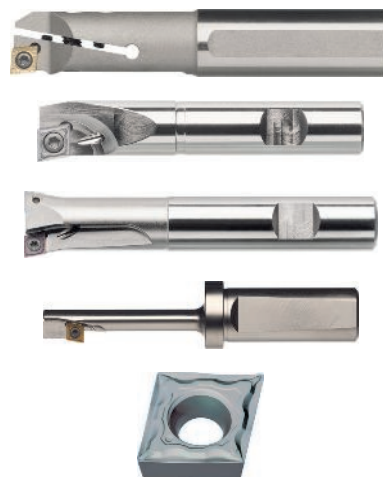
ATORN range of countersink indexable inserts for standard plates CC..06, CC..09 and CC..12
in drilling depths 3xD-7xD

application:

- broad countersinks program for use with ISO indexable inserts with CC.. form
- adjustable single-edge cutter/dual-edge cutter and reverse machining

advantage:

- broad countersink range
- large diameter range can be covered
- standard indexable inserts can be used
- minimises tool costs through flexible use
- high-quality backing material



11233100-140	Indexable inserts, fine-boring rod, single tooth cutter, adjustable for universal use up to 1300 N/mm ² with CC..06 and CC..09..	
11240	Indexable insert countersink, single tooth cutter for universal use up to 1300 N/mm ² with CC..06 and CC..09..	
11243	Indexable insert countersink, twin-blade for universal use up to 1300 N/mm ² with CC..06 and CC..09..	
11251	Reversible tips for reverse boring bar, single-bladed cutter for universal use up to 1300 N/mm ² with CC..06, CC..09 and CC..12..	



ORION high-performance indexable inserts drill
for universal use up to 1300 N/mm²

application:

- high-performance drilling in the diameter range 8.00–40.00 mm
- in drilling depths 3xD / 5xD / 7xD
- simple replacement of cutting inserts even in the machine tool. this reduces ancillary and production costs.
- the tool body is supplied with clamping screws
- universal geometry for steel, cast iron and non-ferrous metals
- low cutting forces and excellent self-centring capability



advantage:

- high-quality backing materials produced from high-strength and heat-resistant powder metal ensure perfectly aligned and true-to-size drilling, even in difficult cutting conditions
- high-precision H6 shaft tolerance
- polished flutes ensure seamless and reliable chip removal even in long-chipping materials
- regrinding no longer required
- simple indexable insert replacement in the machine
- incremental dimensions from 0.1 mm upwards available on request

ORION® Indexable insert drill 3xD
For universal use up to 1300 N/mm² in diameter range from 8.0-40.0 mm



Application:

high-performance drilling in the diameter range 8.00–40.00 mm and at drilling depths of 3xD for universal use of 1300 N/mm².

Execution:

- High-quality HSSE-PM carrier material in the
- diameter range = 8-11.5 mm with an HA straight shank**
- diameter range = 12-40 mm with an HB straight shank**

Advantage:

- high-quality backing material made from high-strength and heat-resistant powder metal, ensures perfectly aligned and dimensionally accurate drilling even under difficult cutting conditions
- polished chipping spaces ensure problem-free, reliable chip removal, even with long-chipping materials
- wide assortment: 3xD, 5xD, 7xD continuous in the diameter range of 8.00–40.00 mm



mm	Suitable for min. cutting Ø (mm)	Suitable for max. cutting Ø (mm)	mm	mm	mm	Cantilever length (mm)	Indexable insert drill 3xD		Clamping screw		Head screw	
							3xD	Ident. No.	Ident. No.	Ident. No.		
8	8	8.4	10	87	32	42	080	o	-	-	080	●
8.5	8.5	8.9	10	89	34	44	085	o	-	-	080	●
9	9	9.4	10	92	36	47	090	o	-	-	090	●
9.5	9.5	9.9	12	97	37	47	095	o	-	-	090	●
10	10	10.4	12	99	40	51	100	o	-	-	100	●
10.5	10.5	10.9	12	102	42	54	105	o	-	-	100	●
11	11	11.4	12	104	44	56	110	o	-	-	100	●
11.5	11.5	11.9	12	107	46	59	115	o	-	-	100	●
12	12	12.4	16	109	48	61	120	o	125	o	120	●
12.5	12.5	12.9	16	111	45	63	125	o	125	o	120	●
13	13	13.4	16	114	52	66	130	o	125	o	120	●
13.5	13.5	13.9	16	116	54	68	135	o	125	o	120	●
14	14	14.4	16	119	56	71	140	●	125	o	140	●
14.5	14.5	14.9	20	123	58	73	145	o	125	o	140	●
15	15	15.4	20	127	60	77	150	o	125	o	140	●
15.5	15.5	15.9	20	130	62	80	155	o	125	o	140	●
16	16	16.4	20	132	64	82	160	o	125	o	160	●
16.5	16.5	16.9	20	135	66	85	165	o	125	o	160	●
17	17	17.4	20	137	68	87	170	o	125	o	160	●
17.5	17.5	17.9	20	139	70	89	175	o	125	o	160	●
18	18	18.4	20	142	72	92	180	o	125	o	180	●
18.5	18.5	18.9	20	144	74	94	185	o	125	o	180	●
19	19	19.4	20	147	76	97	190	o	125	o	180	●
19.5	19.5	19.9	20	149	78	99	195	o	125	o	180	●
20	20	20.4	25	157	80	101	200	o	130	●	200	●
20.5	20.5	20.9	25	160	82	104	205	o	130	●	200	●
21	21	21.4	25	162	84	106	210	o	130	●	200	●
21.5	21.5	21.9	25	165	86	109	215	o	130	●	200	●
22	22	22.4	25	167	88	111	220	o	130	●	220	●
22.5	22.5	22.9	25	169	90	113	225	o	130	●	220	●
23	23	23.4	25	172	92	116	230	●	130	●	220	●
23.5	23.5	23.9	25	174	94	118	235	o	130	●	220	●
24	24	24.4	32	181	96	121	240	o	130	●	240	●
24.5	24.5	24.9	32	183	98	123	245	o	130	●	240	●
25	25	25.4	32	185	100	125	250	o	130	●	240	●
25.5	25.5	25.9	32	188	102	128	255	o	130	●	240	●
26	26	26.4	32	190	104	130	260	o	130	●	260	●
26.5	26.5	26.9	32	193	106	133	265	o	130	●	260	●
27	27	27.4	32	195	108	135	270	o	140	o	260	●
27.5	27.5	27.9	32	197	110	137	275	o	140	o	260	●
28	28	28.4	32	200	112	140	280	o	140	o	280	●
28.5	28.5	28.9	32	202	114	142	285	o	140	o	280	●

mm	Suitable for min. cutting Ø (mm)	Suitable for max. cutting Ø (mm)	mm	Max. drilling depth (D)				Indexable insert drill 3xD		Clamping screw		Head screw	
				mm	mm	mm	Cantilever length (mm)	3xD		11295... Ident. No.	11296... Ident. No.	11295... Ident. No.	11296... Ident. No.
								11213... Ident. No.	3xD				
29	29	29.4	32	205	116	145	290	○	140	○	280	●	
29.5	29.5	29.9	32	207	118	147	295	○	140	○	280	●	
30	30	30.4	32	209	120	149	300	○	140	○	300	●	
30.5	30.5	30.9	32	212	122	152	305	○	140	○	300	●	
31	31	31.4	32	214	124	154	310	○	150	○	300	●	
31.5	31.5	31.9	32	217	126	157	315	○	150	○	300	●	
32	32	32.4	32	219	128	159	320	○	150	○	320	●	
32.5	32.5	32.9	32	221	130	161	325	○	150	○	320	●	
33	33	33.4	32	224	132	164	330	○	150	○	320	●	
33.5	33.5	33.9	32	226	134	166	335	○	150	○	320	●	
34	34	34.4	40	239	136	169	340	○	150	○	320	●	
34.5	34.5	34.9	40	241	138	171	345	○	150	○	320	●	
35	35	35.4	40	243	140	173	350	○	150	○	320	●	
35.5	35.5	35.9	40	246	142	176	355	○	150	○	320	●	
36	36	36.4	40	248	144	178	360	○	150	○	360	●	
36.5	36.5	36.9	40	251	146	181	365	○	150	○	360	●	
37	37	37.4	40	253	148	183	370	○	150	○	360	●	
37.5	37.5	37.9	40	255	150	185	375	○	150	○	360	●	
38	38	38.4	40	258	152	188	380	○	150	○	360	●	
38.5	38.5	38.9	40	260	154	196	385	○	150	○	360	●	
39	39	39.4	40	263	156	193	390	○	150	○	360	●	
39.5	39.5	39.9	40	265	158	195	395	○	150	○	360	●	
40	40	40.4	40	267	160	197	400	○	160	○	380	●	

Prod. Gr. 119

ORION® Indexable insert drill 5xD

For universal use up to 1300 N/mm² in diameter range from 8.0-40.0 mm



Application:

high-performance drilling in the diameter range 8.00-40.00 mm and at drilling depths of 5xD for universal use of 1300 N/mm².

Execution:

- high-quality HSSE-PM backing material in the
- diameter range = 8-11.5 mm with an HA straight shank
- diameter range = 12-40 mm with an HB straight shank

Advantage:

- high-quality backing material made from high-strength and heat-resistant powder metal, ensures perfectly aligned and dimensionally accurate drilling even under difficult cutting conditions
- polished chipping spaces ensure problem-free, reliable chip removal, even with long-chipping materials
- wide assortment: 3xD, 5xD, 7xD continuous in the diameter range of 8.00-40.00 mm

mm	Suitable for min. cutting Ø (mm)	Suitable for max. cutting Ø (mm)	mm	Max. drilling depth (D)				Indexable insert drill 5xD		Clamping screw		Head screw	
				mm	mm	mm	Cantilever length (mm)	5xD		11295... Ident. No.	11296... Ident. No.	11295... Ident. No.	11296... Ident. No.
								11215... Ident. No.	5xD				
8	8	8.4	10	103	48	58	080	○	-	-	080	●	
8.5	8.5	8.9	10	106	51	61	085	○	-	-	080	●	
9	9	9.4	10	110	54	65	090	○	-	-	090	●	
9.5	9.5	9.9	12	116	57	68	095	○	-	-	090	●	
10	10	10.4	12	119	60	71	100	○	-	-	100	●	
10.5	10.5	10.9	12	123	63	75	105	○	-	-	100	●	
11	11	11.4	12	126	66	78	110	○	-	-	100	●	
11.5	11.5	11.9	12	130	69	82	115	○	-	-	100	●	
12	12	12.4	16	133	72	85	120	○	125	○	120	●	
12.5	12.5	12.9	16	136	75	88	125	○	125	○	120	●	
13	13	13.4	16	140	78	92	130	○	125	○	120	●	
13.5	13.5	13.9	16	143	81	95	135	○	125	○	120	●	
14	14	14.4	16	147	84	99	140	○	125	○	140	●	
14.5	14.5	14.9	20	152	87	102	145	○	125	○	140	●	
15	15	15.4	20	157	90	107	150	●	125	○	140	●	
15.5	15.5	15.9	20	161	93	111	155	○	125	○	140	●	
16	16	16.4	20	164	96	114	160	○	125	○	160	●	
16.5	16.5	16.9	20	168	99	118	165	○	125	○	160	●	
17	17	17.4	20	171	102	121	170	○	125	○	160	●	
17.5	17.5	17.9	20	174	105	124	175	○	125	○	160	●	
18	18	18.4	20	178	108	128	180	○	125	○	180	●	
18.5	18.5	18.9	20	181	111	131	185	○	125	○	180	●	
19	19	19.4	20	185	114	135	190	○	125	○	180	●	
19.5	19.5	19.9	20	188	117	138	195	○	125	○	180	●	
20	20	20.4	25	197	120	141	200	○	130	●	200	●	
20.5	20.5	20.9	25	201	123	145	205	○	130	●	200	●	
21	21	21.4	25	204	126	148	210	○	130	●	200	●	
21.5	21.5	21.9	25	208	129	152	215	○	130	●	200	●	
22	22	22.4	25	211	132	155	220	○	130	●	220	●	
22.5	22.5	22.9	25	214	135	158	225	○	130	●	220	●	
23	23	23.4	25	218	138	162	230	○	130	●	220	●	
23.5	23.5	23.9	25	221	141	168	235	○	130	●	220	●	
24	24	24.4	32	229	144	169	240	○	130	●	240	●	
24.5	24.5	24.9	32	232	147	172	245	○	130	●	240	●	
25	25	25.4	32	235	150	175	250	○	130	●	240	●	



mm	Suitable for min. cutting Ø (mm)	Suitable for max. cutting Ø (mm)	mm	mm	Max. drilling depth (D)		Indexable insert drill 5xD		Clamping screw		Head screw	
					mm	Cantilever length (mm)	5xD					
							11215... Ident. No.	11295... Ident. No.	11296... Ident. No.			
25.5	25.5	25.9	32	239	153	179	255	○	130	●	240	●
26	26	26.4	32	242	156	182	260	○	130	●	260	●
26.5	26.5	26.9	32	246	159	186	265	○	130	●	260	●
27	27	27.4	32	249	162	189	270	○	140	○	260	●
27.5	27.5	27.9	32	252	165	192	275	○	140	○	260	●
28	28	28.4	32	256	168	196	280	○	140	○	280	●
28.5	28.5	28.9	32	259	171	199	285	○	140	○	280	●
29	29	29.4	32	263	174	203	290	○	140	○	280	●
29.5	29.5	29.9	32	266	177	206	295	○	140	○	280	●
30	30	30.4	32	269	180	209	300	○	140	○	300	●
30.5	30.5	30.9	32	273	183	213	305	○	140	○	300	●
31	31	31.4	32	276	186	216	310	○	150	○	300	●
31.5	31.5	31.9	32	280	189	220	315	○	150	○	300	●
32	32	32.4	32	283	192	223	320	○	150	○	320	●
32.5	32.5	32.9	32	286	195	226	325	○	150	○	320	●
33	33	33.4	32	290	198	230	330	○	150	○	320	●
33.5	33.5	33.9	32	293	201	233	335	○	150	○	320	●
34	34	34.4	40	307	204	237	340	○	150	○	320	●
34.5	34.5	34.9	40	310	207	240	345	○	150	○	320	●
35	35	35.4	40	313	210	243	350	○	150	○	320	●
35.5	35.5	35.9	40	317	213	247	355	○	150	○	320	●
36	36	36.4	40	320	216	250	360	○	150	○	360	●
36.5	36.5	36.9	40	324	219	254	365	○	150	○	360	●
37	37	37.4	40	327	222	257	370	○	150	○	360	●
37.5	37.5	37.9	40	330	225	260	375	○	150	○	360	●
38	38	38.4	40	334	228	264	380	○	150	○	360	●
38.5	38.5	38.9	40	337	231	267	385	○	150	○	360	●
39	39	39.4	40	341	234	271	390	○	150	○	360	●
39.5	39.5	39.9	40	344	237	274	395	○	150	○	360	●
40	40	40.4	40	347	240	277	400	○	160	○	380	●

Prod. Gr. 119

ORION® Indexable insert drill 7xD

For universal use up to 1300 N/mm² in diameter range from 8.0-40.0 mm



Application:

high-performance drilling in the diameter range 8.00-40.00 mm and at drilling depths of 7xD for universal use of 1300 N/mm².

Execution:

- High-quality HSSE-PM carrier material in the
- diameter range = 8-11.5 mm with an HA straight shank**
- diameter range = 12-40 mm with an HB straight shank**

Advantage:

- high-quality backing material made from high-strength and heat-resistant powder metal, ensures perfectly aligned and dimensionally accurate drilling even under difficult cutting conditions
- polished chipping spaces ensure problem-free, reliable chip removal, even with long-chipping materials
- wide assortment: 3xD, 5xD, 7xD continuous in the diameter range of 8.00-40.00 mm

mm	Suitable for min. cutting Ø (mm)	Suitable for max. cutting Ø (mm)	mm	mm	mm	Cantilever length (mm)	Indexable insert drill 7xD		Clamping screw		Head screw	
							7xD					
							11217... Ident. No.	11295... Ident. No.	11296... Ident. No.			
8	8	8.4	10	119	64	74	080	○	-	-	080	●
8.5	8.5	8.9	10	123	68	78	085	○	-	-	080	●
9	9	9.4	10	128	72	83	090	○	-	-	090	●
9.5	9.5	9.9	12	135	76	87	095	○	-	-	090	●
10	10	10.4	12	139	80	91	100	○	-	-	100	●
10.5	10.5	10.9	12	144	84	96	105	○	-	-	100	●
11	11	11.4	12	148	88	100	110	○	-	-	100	●
11.5	11.5	11.9	12	153	92	105	115	○	-	-	100	●
12	12	12.4	16	157	96	109	120	○	125	○	120	●
12.5	12.5	12.9	16	161	100	113	125	○	125	○	120	●
13	13	13.4	16	166	104	118	130	○	125	○	120	●
13.5	13.5	13.9	16	170	108	122	135	○	125	○	120	●
14	14	14.4	16	175	112	127	140	○	125	○	140	●
14.5	14.5	14.9	20	181	116	131	145	○	125	○	140	●
15	15	15.4	20	187	120	137	150	○	125	○	140	●
15.5	15.5	15.9	20	192	124	142	155	○	125	○	140	●
16	16	16.4	20	196	128	146	160	○	125	○	160	●
16.5	16.5	16.9	20	201	132	151	165	○	125	○	160	●
17	17	17.4	20	205	136	155	170	○	125	○	160	●
17.5	17.5	17.9	20	209	140	159	175	○	125	○	160	●
18	18	18.4	20	214	144	164	180	○	125	○	180	●
18.5	18.5	18.9	20	218	148	168	185	○	125	○	180	●
19	19	19.4	20	223	152	173	190	○	125	○	180	●
19.5	19.5	19.9	20	227	156	177	195	○	125	○	180	●
20	20	20.4	25	232	160	181	200	○	130	●	200	●
20.5	20.5	20.9	25	237	164	186	205	○	130	●	200	●
21	21	21.4	25	246	168	190	210	○	130	●	200	●
21.5	21.5	21.9	25	251	172	195	215	○	130	●	200	●



Drilling tools with indexable inserts \ indexable insert drill

mm	Suitable for min. cutting Ø (mm)	Suitable for max. cutting Ø (mm)	mm	mm	mm	Cantilever length (mm)	Indexable insert drill 7xD		Clamping screw		Head screw	
							7xD					
							11217... Ident. No.		11295... Ident. No.		11296... Ident. No.	
22	22	22.4	25	255	176	199	220	○	130	●	220	●
22.5	22.5	22.9	25	259	180	203	225	○	130	●	220	●
23	23	23.4	25	264	184	208	230	○	130	●	220	●
23.5	23.5	23.9	25	268	188	212	235	○	130	●	220	●
24	24	24.4	32	277	192	217	240	○	130	●	240	●
24.5	24.5	24.9	32	281	196	221	245	○	130	●	240	●
25	25	25.4	32	285	200	225	250	○	130	●	240	●
25.5	25.5	25.9	32	290	204	230	255	○	130	●	240	●
26	26	26.4	32	294	208	234	260	○	130	●	260	●
26.5	26.5	26.9	32	299	212	239	265	○	130	●	260	●
27	27	27.4	32	303	216	243	270	○	140	○	260	●
27.5	27.5	27.9	32	307	220	247	275	○	140	○	260	●
28	28	28.4	32	312	224	252	280	○	140	○	280	●
28.5	28.5	28.9	32	316	228	256	285	○	140	○	280	●
29	29	29.4	32	321	232	261	290	○	140	○	280	●
29.5	29.5	29.9	32	325	236	265	295	○	140	○	280	●
30	30	30.4	32	329	240	269	300	○	140	○	300	●
30.5	30.5	30.9	32	334	244	274	305	○	140	○	300	●
31	31	31.4	32	338	248	278	310	○	150	○	300	●
31.5	31.5	31.9	32	343	252	283	315	○	150	○	300	●
32	32	32.4	32	347	256	287	320	○	150	○	320	●
32.5	32.5	32.9	32	351	260	291	325	○	150	○	320	●
33	33	33.4	32	356	264	296	330	○	150	○	320	●
33.5	33.5	33.9	32	360	268	300	335	○	150	○	320	●
34	34	34.4	40	375	272	305	340	○	150	○	320	●
34.5	34.5	34.9	40	379	276	309	345	○	150	○	320	●
35	35	35.4	40	383	280	313	350	○	150	○	320	●
35.5	35.5	35.9	40	388	284	318	355	○	150	○	320	●
36	36	36.4	40	392	288	321	360	○	150	○	360	●
36.5	36.5	36.9	40	397	292	327	365	○	150	○	360	●
37	37	37.4	40	401	296	331	370	○	150	○	360	●
37.5	37.5	37.9	40	405	300	335	375	○	150	○	360	●
38	38	38.4	40	410	304	340	380	○	150	○	360	●
38.5	38.5	38.9	40	414	308	344	385	○	150	○	360	●
39	39	39.4	40	419	312	349	390	○	150	○	360	●
39.5	39.5	39.9	40	423	316	353	395	○	150	○	360	●
40	40	40.4	40	427	320	357	400	○	160	○	380	●

Prod. Gr. 119

ORION® Solid carbide TiAlN cutter insert for indexable insert drill no. 11213-11217



For universal use up to 1300 N/mm²



Application:

High-performance drilling in conjunction with indexable insert drill no. 11213-11217, for universal application of 1300 N/mm².

Execution:

- Precision-ground indexable insert, tip angle 130°

Notes:

incremental dimensions from 0.1 mm upwards readily available on request



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11220	95	80	65	50	40	200	250	230	180	160	130			95	35	30	30		

Cutting edge Ø (mm)			11220... Ident. No.	Cutting edge Ø (mm)			11220... Ident. No.
8			080	14.5			145
8.5			085	14.8			148
8.8			088	15			150
9			090	15.1			151
9.3			093	15.5			155
9.5			095	15.8			158
9.8			098	16			160
10			100	16.5			165
10.2			102	16.8			168
10.5			105	17			170
10.8			108	17.5			175
11			110	17.8			178
11.2			112	18			180
11.5			115	18.5			185
11.8			118	18.8			188
12			120	19			190
12.5			125	19.5			195
12.8			128	19.8			198
13			130	20			200
13.1			131	20.5			205
13.5			135	20.8			208
13.8			138	21			210
14			140	21.5			215



Cutting edge Ø (mm)	11220... Ident. No.		Cutting edge Ø (mm)	11220... Ident. No.	
21.8	218	●	31	310	●
22	220	●	31.5	315	●
22.5	225	●	31.7	317	○
22.8	228	●	32	320	●
23	230	●	32.5	325	○
23.5	235	●	32.7	327	●
23.8	238	●	33	330	●
24	240	●	33.5	335	○
24.5	245	○	33.7	337	○
24.8	248	○	34	340	●
25	250	●	34.5	345	●
25.5	255	○	34.7	347	○
25.7	257	○	35	350	○
26	260	●	35.5	355	○
26.5	265	○	35.7	357	○
26.7	267	○	36	360	○
27	270	●	36.5	365	○
27.5	275	●	36.7	367	○
27.7	277	●	37	370	○
28	280	●	37.5	375	○
28.5	285	●	37.7	377	○
28.7	287	○	38	380	○
29	290	●	38.5	385	○
29.5	295	○	38.7	387	○
29.7	297	○	39	390	○
30	300	●	39.5	395	○
30.5	305	○	39.7	397	○
30.7	307	○	40	400	●

Prod. Gr. 119



troubleshooting indexable insert drilling

wear to open space

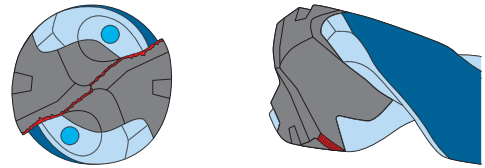
wear to open space is the preferred type of wear, if it is even.

problem

- cutting speed too high
- oil content in coolant too low
- too little cooling
- concentricity error

countermeasures

- lower cutting speed
- increase oil content in coolant
- increase coolant quantity
- check concentricity



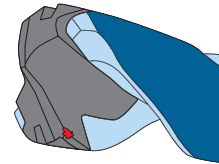
plastic deformation

problem

- cutting speed too high
- feed rate too high
- too little cooling

countermeasure

- reduce cutting speed
- reduce feed rate
- increase cooling



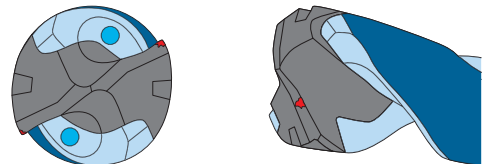
breakouts

problem

- tip angles do not match
- unstable conditions
- concentricity error
- feed rate too high
- too little cooling

countermeasure

- check tip angle
- check clamping
- check concentricity
- reduce feed rate
- increase cooling



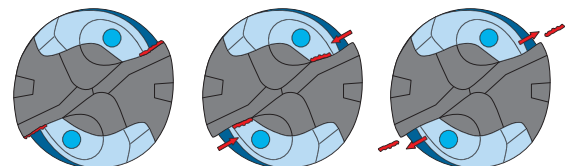
built-up edge

problem

- cutting speed too high/too low
- oil content of coolant too low

countermeasure

- increase cutting speed so that the built-up edge moves to the centre
- decrease cutting speed so that the built-up edge moves to the outer edge or is avoided
- increase coolant oil content





troubleshooting indexable insert drilling

rapid wear of the peripheral cutting edge

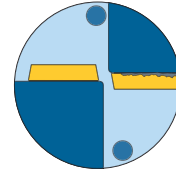
wear to open space is the preferred type of wear, if it is even.

problem

- cutting speed too high
- too little cooling
- wrong cemented carbide type

countermeasures

- reduce cutting speed
- increase cooling
- select a more wear-resistant cemented carbide type



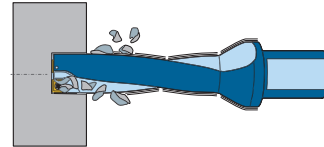
vibrations on the tool body

problem

- cutting speed too high
- feed rate too high
- too little cooling

countermeasure

- reduce cutting speed
- reduce feed rate
- increase cooling



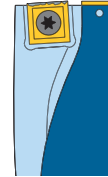
rapid wear of the inner cutting edge

problem

- uneven workpiece surface
- unstable tool/workpiece clamping conditions
- wrong cemented carbide type

countermeasure

- reduce feed rate by 50%
- check tool/workpiece clamping
- select a tougher grade of cemented carbide



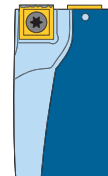
rapid wear of the outer cutting edge

problem

- feed rate too high
- uneven workpiece surface
- wrong cemented carbide type
- wrong indexable insert geometry

countermeasure

- reduce feed rate
- reduce feed rate by 50%
- select a tougher grade of cemented carbide
- use an indexable insert geometry for higher feed rates



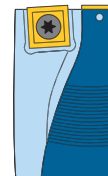
chips welding to the tool body

problem

- cutting speed too low (long-chipping)
- feed rate too high (long-chipping)
- feed rate too low
- too little cooling

countermeasure

- increase cutting speed (long-chipping)
- reduce feed rate (long-chipping)
- increase feed rate
- increase cooling



long continuous chips are produced

problem

- cutting speed too low (long-chipping)
- feed rate too high (long-chipping)
- feed rate too low
- incorrect indexable insert geometry

countermeasure

- increase cutting speed (long-chipping)
- reduce feed rate (long-chipping)
- increase feed rate
- use an indexable insert geometry for lower feed rates





**DO YOU WANT AN EVEN BIGGER
CHOICE OF MACHINING TOOLS?**

WE HAVE WHAT IT TAKES.

For a complete range of products that meet the toughest demands, visit www.iconridge.com



conical countersink 90° solid carbide

application:

for 90° screw head countersinking or deburring holes.

advantage:

- very wide range
- many shaft designs and shapes
- very long service life through high-quality solid carbide cutting material



		P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	H	H 65HRC	
11501705-724	Conical countersink, 90°, solid carbide, triple cutter, extremely uneven pitch For universal use up to 60 HRC	●	●	●	●	●	●	○	○	○	
11500230-285	Conical countersink 90° solid carbide, three-edge For universal use up to 1300 N/mm ²	●	●	●	●	●	●	○			
11535	Conical countersink, 90°, solid carbide, multi-flute cutter For universal use up to 60 HRC	●	●	●	●	○	○	●	●	●	
11536	Conical countersink, 90°, solid carbide, multi-flute cutter For universal use up to 60 HRC	●	●	●	●	○	○	●	●	●	



conical countersink 90° HSS / HSSE

application:

for 90° screw head countersinking or deburring holes.

advantage:

- very wide range
- many cutting materials available
- many shaft designs and shapes



		P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	H	H 65HRC	
11500006-138	Conical countersink 90° HSS, three-edge For universal use up to 1000 N/mm ²	●	○	○		●	○				
11500601-648	Conical countersink 90° HSS-TiAlN, three-edge For universal use up to 1000 N/mm ²	●	○	○	●	●	○		○		
11501006-138	90° conical countersink, HSS, triple cutter for universal use up to 1000 N/mm ²	●	○	○		●	○				
11501146-218	Conical countersink, 90°, HSSE-TiN, triple cutter for universal use up to 1000 N/mm ²	●	○	○		●	○				
11501800-825	Conical countersink, 90°, HSSE-TiN, triple cutter for universal use up to 1000 N/mm ²	●	○	○		●	○				
11501826-853	Conical countersink, 90°, HSS TiAlN, triple-edge cutter For universal use up to 1000 N/mm ²	●	○	○		●	○				
11501637-661	Conical countersink, 90°, HSS, triple cutter, extremely uneven pitch for universal use up to 1000 N/mm ²	●	●	●	●	○	●		○		



		P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	H	H 65HRC	
11500698-750	90° conical countersink, HSSE, triple cutter for universal use up to 1300 N/mm ²	●	●	○	●	●	○	○			
11501506-561	90° conical countersink HSS triple cutter with 3-edge shank for universal use up to 1000 N/mm ²	●	○	○		●	○				
11501300-455	90° conical countersink, HSS, triple cutter, extra-long for universal use up to 1000 N/mm ²	●	○	○		○	○				
11492	Conical countersink, 90°, HSS, with bit holder For universal use up to 1000 N/mm ²	●	●	○		●	○				
11531	Conical countersink, 90°, HSSE, multi-flute cutter For universal use up to 1300 N/mm ²	●	●	●	●	○	○	●			
11516010-050	Conical countersink, 90°, HSSE-TiN, single-bladed cutter for universal use up to 1300 N/mm ²	●	●	○	○	●	○				
11515210-230	Conical countersink, 90°, HSSE, extra-long single flute cutter For universal use up to 1300 N/mm ²	●	●	○	○	●	○				



conical countersink 60° solid carbide

application:

for 60° screw head countersinking or deburring holes.

advantage:

- very wide range
- many shaft designs and shapes
- very long service life through high-quality solid carbide cutting material



		P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	H	H 65HRC	
11498308-325	Conical countersink 60° solid carbide, three-edge For universal use up to 1300 N/mm ²	●	●	●	●	●	●	○			
11498226-263	60° conical countersink, HSS, triple cutter for universal use up to 1000 N/mm ²	●	●	○		●	●				



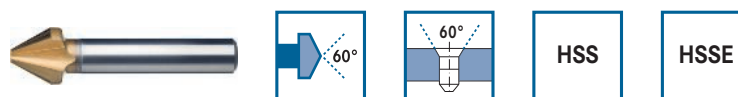
conical countersink 60° HSS / HSSE

application:

for 60° screw head countersinking or deburring holes.

advantage:

- very wide range
- many cutting materials available
- many shaft designs and shapes



		P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	H	H 65HRC	
11498206-225	Conical countersink 60° HSS-TiN, three-edge For universal use up to 1000 N/mm ²	●	○	○		●	○				
11495308-320	Conical countersink, 60°, HSS, multi-flute cutter For universal use up to 1000 N/mm ²	●	○	○		○	○				
11495330-360	Conical countersink, 60°, HSS, multi-flute cutter For universal use up to 1000 N/mm ²	●	○	○		○	○				
11498226-263	60° conical countersink, HSS, triple cutter for universal use up to 1000 N/mm ²	●	●	○		●	●				
11497405-430	Conical countersink, 60°, HSSE, single-bladed cutter For universal use up to 1300 N/mm ²	●	●	○		●	○				



conical countersink HSS 75°

application:

for 75° screw head countersinking or deburring holes.



		P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	H	H 65HRC	
11499008-025	Conical countersink 75° HSS, three-edge For universal use up to 1000 N/mm ²	●	○	○		○	○				



conical countersink HSS 120°

application:

for 120° screw head countersinking or deburring holes.



		P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	H	H 65HRC	
11502106-126	120° conical countersink, HSS, triple cutter for universal use up to 1000 N/mm ²	●	○	○		○	○				
11502231-250	Conical countersink 120° HSS, three-edge For universal use up to 1000 N/mm ²	●	○	○		○	○				



conical countersink 90° solid carbide

application:

for 90° screw head countersinking or deburring holes.

advantage:

- very wide range
- many shaft designs and shapes
- very long service life through high-quality solid carbide cutting material



ORION® Solid carbide 90° conical countersink, three-flute cutter
for universal use up to 1300 N/mm²



Application:

For producing 90° counterbores up to 1000 N/mm².

Advantage:

- precision grinding for high dimensional accuracy requirements
- Solid carbide cutting material for high service life requirements

Execution:

- profile-ground three-edge countersink with straight cutting edge

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plas-tics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11500231-286	60	45	20	20	15	80	150	120	100	80	60	60		40	20	20	20		

mm	mm	mm	mm	mm	mm	Surface		Uncoated	
						f steel 1300	● (mm/U)	11500...	Ident. No.
6	1.5	6	45	0.06	231	●			
6.3	1.5	6	45	0.06	234	●			
8	2	6	50	0.08	236	●			
8.3	2	6	50	0.08	238	●			
10	2.5	6	50	0.09	241	●			
10.4	2.5	6	50	0.09	243	●			
11.5	2.8	8	56	0.1	246	●			
12.4	2.8	8	56	0.1	251	●			
15	3.2	10	60	0.12	256	●			
16.5	3.2	10	60	0.12	261	●			
20.5	3.5	10	63	0.13	271	●			
25	3.8	10	67	0.14	281	●			
31	4.2	12	71	0.16	286	●			

Prod. Gr. 103



conical countersink 90° HSS / HSSE

application:

for 90° screw head countersinking or deburring holes.

advantage:

- very wide range
- many cutting materials available
- many shaft designs and shapes



ATORN® ORION® HSS 90° conical countersinks (DIN 335)
For universal use



Application:

For producing 90° counterbores up to 1000 N/mm².

Execution:

- profile-ground triple-edge countersink with radial relief

Advantage:

- radial relief ensures optimum chip breaking
- No. 11500 601–11500 648: TiNAlOX coating for increased service life requirements
- No. 11501 826–11501 853: TiAlN coating for increased service life requirements



No. 11500 006–11500 138, 11501 006–11501 138
HSS



No. 11500 601–11500 648
HSS TiNAlOX



No. 11501 146–11501 825
HSS-TiN



No. 11501 826–11501 853

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11500006-138	30	20	10	8		40	70	60	50	40	30	30		15					
11500601-648	30	20	10	10	8	40	70	60	50	40	30	30		15	8			20	
11501006-138	30	20	10	8		40	70	60	50	40	30	30		15					
11501146-218	30	20	10	10		40	70	60	50	40	30	30		15	8				
11501800-825	30	20	10	8		40	70	60	50	40	30	30		15					
11501826-853	30	20	10	8		40	70	60	50	40	30	30		15					

					ATORN®		ORION®				ATORN®	
					Uncoated	TiNAlOX	Uncoated	TiN	TiN	TiAlN		
↓ mm	↓ mm	↓ mm	↓ mm	Surface f steel 700 (mm/U)	11500... Ident. No.	11500... Ident. No.	11501... Ident. No.	11501... Ident. No.	11501... Ident. No.	11501... Ident. No.	11501... Ident. No.	
4.3	1.3	4	40	0.06	006	601	006	146	800	826		
5	1.5	4	40	0.07	011	602	011	151	801	827		
5.3	1.5	4	40	0.07	013	604	013	153	802	828		
5.8	1.5	5	45	0.08	016	606	016	155	803	829		
6	1.5	5	45	0.08	021	608	021	157	804	830		
6.3	1.5	5	45	0.08	026	611	026	161	805	831		
7	1.8	6	50	0.09	031	612	031	163	806	832		
7.3	1.8	6	50	0.09	036	614	036	165	807	833		
8	2	6	50	0.1	041	616	041	167	808	834		
8.3	2	6	50	0.1	046	618	046	171	809	835		
9.4	2.2	6	50	0.11	048	621	048	173	810	836		
10	2.5	6	50	0.12	051	622	051	168	811	837		
10.4	2.5	6	50	0.12	056	624	056	177	812	838		
11.5	2.8	8	56	0.13	061	626	061	179	813	839		
12.4	2.8	8	56	0.13	071	628	071	181	814	841		
13.4	2.9	8	56	0.13	076	631	076	186	815	842		
15	3.2	10	60	0.14	081	632	081	191	816	843		
16.5	3.2	10	60	0.14	096	634	096	196	817	844		
19	3.5	10	63	0.15	101	636	101	198	818	846		
20.5	3.5	10	63	0.16	114	638	114	201	819	847		
23	3.8	10	67	0.17	121	640	121	206	820	848		
25	3.8	10	67	0.18	131	642	131	211	821	849		
28	4	12	71	0.19	132	644	136	216	822	851		
30	4.2	12	71	0.2	136	646	137	217	823	852		
31	4.2	12	71	0.21	138	648	138	218	824	853		
40	10	12	75	0.25	-	-	-	-	825	-		

ATORN® = Prod. Gr. 1EB
ORION = Prod. Gr. 1EH



ATORN® ORION® HSS/HSSE 90° conical countersink sets (DIN 335)

For universal use



Application:

Ident. No. 010–620: For producing 90° counterbores up to 1000 N/mm².

Ident. No. 700–720: For producing 90° counterbores up to 1300 N/mm².

Execution:

- profile-ground triple-edge countersink with radial relief

Advantage:

- radial relief ensures optimum chip breaking
- Ident. No. 480, 490, 500, 510, 520, 530:** TiN coating for increased service life requirements
- Ident. No. 600–620:** TiNAlOX coating for increased requirements in service life



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11507010-061	30	20	10	8		40	70	60	50	40	30	30		15					
11507015-065	30	20	10	8		40	70	60	50	40	30	30		15					
11507480-530	30	20	10	8		40	70	60	50	40	30	30		15					
11507485-535	30	20	10	8		40	70	60	50	40	30	30		15					
11507700-720	30	20	10	8	6	40	70	60	50	40	30	30		15					

Cutting material Surface	Composition of set	Number of pieces in assortment/set (PCS)	ATORN®		ORION®		ATORN®		ORION®		ATORN®	
			HSS Uncoated	HSS Uncoated	HSS TiN	HSS TiN	HSS TiNAlOX	HSSE Uncoated				
	8/10/11.5/15	4	11507... 010	●	11507... 015	●	11507... 480	●	11507... 485	●	-	-
	10.4/16.5/20.5/25	4	020	●	025	●	490	●	495	●	-	-
	6/8/10/11.5/15/19	6	031	●	035	●	500	●	505	●	600	●
	6/8/10/11.5/15/19/25	7	041	●	045	●	510	●	515	●	-	-
	6.3/8.3/10.4/12.4/16.5/20.5	6	051	●	055	●	520	●	525	●	620	●
	6.3/8.3/10.4/12.4/16.5/20.5/25	7	061	●	065	●	530	●	535	●	-	-

ATORN® = Prod. Gr. 1EB
ORION = Prod. Gr. 1EH

ATORN® ORION® HSS 90° conical countersink set (DIN 335)

For universal use



Application:

For producing 90° counterbores up to 1000 N/mm².

Execution:

- profile-ground triple-edge countersink with radial relief

Advantage:

- radial relief ensures optimum chip breaking
- Ident. No. 020:** TiN coating for increased requirements in service life
- Ident. No. 030:** TiNAlOX coating for increased requirements in service life



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11512011	30	20	10	8		40	70	60	50	40	30	30		15					
11512015	30	20	10	8		40	70	60	50	40	30	30		15					
11512020	30	20	10	8		40	70	60	50	40	30	30		15					
11512025	30	20	10	8		40	70	60	50	40	30	30		15					
11512030	30	20	10	8		40	70	60	50	40	30	30		15					

Cutting material Surface	Composition of set	Number of pieces in assortment/set (PCS)	ATORN®		ORION®		ATORN®		ORION®		ATORN®	
			HSS Uncoated	HSS Uncoated	HSS TiN	HSS TiN	HSS TiNAlOX	HSSE Uncoated				
	4.3/5.0/6.0/6.3/7.0/8.0/8.3/10.0/10.4/11.5/12.4/15.0/16.5/19.0/20.5/23.0/25.0	17	11512... 011	●	11512... 015	●	11512... 020	●	11512... 025	●	11512... 030	●

ATORN® = Prod. Gr. 1EB
ORION = Prod. Gr. 1EH

ORION® HSS 90° conical countersink with bit holder
for universal use up to 1000 N/mm²



Application:

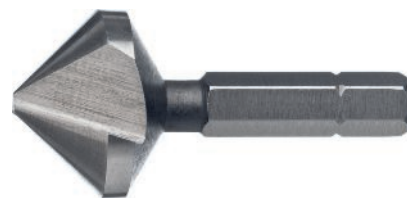
For countersinking, chamfering and deburring. For use in hand-held bit holders, electric hand drills and electric screwdrivers.

Execution:

- profile-ground

Advantage:

- Hexagonal shank, 1/4" provides a user-friendly tool chuck in the bit holder



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
11492	●	●	○	○		●	●	●	●	●	●	●	○	○						

Suitable for screw thread	Spot-facer Ø (mm)	Tip Ø (mm)	Shaft length (mm)	Length (mm)	11492... Ident. No.	
M3	6.3	1.5	20	31	063	●
M4	8.3	2.0	20	31	083	●
M5	10.4	2.5	20	34	104	●
M6	12.4	2.8	20	35	124	●
M8	16.5	3.2	20	40	165	●
M10	20.5	3.5	20	41	205	●

Prod. Gr. 1EH

ORION® HSS 90° conical countersink set with bit holder
for universal use up to 1000 N/mm²



Application:

For countersinking, chamfering and deburring. For use in hand-held bit holders, electric hand drills and electric screwdrivers.

Execution:

- profile-ground

Advantage:

- Hexagonal shank, 1/4" provides a user-friendly tool chuck in the bit holder



Composition of set	1 each of countersink 6.3/8.3/10.4/12.4/16.5/20.5
Number of pieces in assortment/set (PCS)	6
11493... Ident. No.	520

Prod. Gr. 1EH

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11493	●	●	○	○		●	●	●	●	●	●	●	○	○					

ATORN® ORION® HSS/HSSE 90° conical countersink, three-way cutter (DIN 335)



For universal use



Application:

Ident. No. 312-373, 382-393, 402-403, 412-413, 422-423, 432-433, 442-443: For producing 90° counterbores up to 1000 N/mm².

Ident. No. 381, 401, 411, 421, 431, 441: For producing 90° counterbores up to 1300 N/mm².

Execution:

- profile-ground triple-edge countersink with radial relief

Advantage:

- radial relief ensures optimum chip breaking

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GJMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11500312-442	30	20	10	10		40	70	60	50	40	30	30		15					
11500353-443	30	20	10	10		40	70	60	50	40	30	30		15					
11500381-441	40	30	15	10	8	40	70	60	50	40	30	30		25	10	10			

mm	mm	mm	mm	mm	Cutting material f steel 700 (mm/U)	ATORN®		ORION®		ATORN®	
						HSS	HSSE	HSS	HSSE		
15	3.2	85	MK 1	0.14	11500...	●	-	-	-	-	-
16.5	3.2	85	MK 1	0.14	322	●	-	-	-	-	-
20.5	3.5	100	MK 2	0.16	337	●	-	-	-	-	-
25	3.8	106	MK 2	0.18	352	●	353	●	-	-	-
28	4	112	MK 2	0.19	367	●	-	-	-	-	-
30	4.2	112	MK 2	0.2	372	●	373	●	-	-	-
31	4.2	112	MK 2	0.21	382	●	383	●	381	●	●
34	4.5	118	MK 2	0.22	392	●	393	●	-	-	-
37	4.8	118	MK 2	0.24	402	●	403	●	401	●	●
40	10	140	MK 3	0.25	412	●	413	●	411	●	●
50	14	150	MK 3	0.28	422	●	423	●	421	●	●
63	16	180	MK 4	0.33	432	●	433	●	431	●	●
80	22	190	MK 4	0.33	442	●	443	●	441	●	●

ATORN® = Prod. Gr. 1EB
ORION® = Prod. Gr. 1EH

ATORN® ORION® HSSE 90° conical countersink and deburring tool



for universal use up to 1000 N/mm²



Application:

For producing 60° counterbores up to 1300 N/mm².

Execution:

- **Ident. No. 605-651:** profile-ground single-edge countersink with radial relief
- **Ident. No. 905-951:** profile-ground single-edge countersink

Advantage:

- radial relief ensures optimum chip breaking
- deep and wide flute provides optimum chip removal
- **Ident. No. 605-651:** special geometry ensures vibration-free and accurate countersinking with high finish quality

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GJMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11497605-651	30	20	10	8	7	40	70	50	40	35	30	30		15	8				
11497905-951	30	20	10	8	7	40	70	50	40	35	30	30		15	8				

mm	Min./max. cutting edge Ø	mm	mm	f steel 1000 (mm/U)	ATORN®		ORION®	
					11497...	HSSE	11497...	HSSE
5	1-5 mm	5	50	0.07	605	●	905	●
10	1-10 mm	10	60	0.12	610	●	910	●
15	2-15 mm	10	65	0.14	615	●	915	●
20	2-20 mm	10	73	0.16	620	●	920	●
25	2-25 mm	10	80	0.18	625	●	925	●
30	3-30 mm	12	82	0.2	630	●	930	●
40	3-40 mm	15	92	0.25	640	●	940	●
40	3-40 mm	12	92	0.25	641	●	941	●
50	3-50 mm	15	100	0.28	650	●	950	●
50	3-50 mm	12	100	0.30	651	●	951	●

ATORN® = Prod. Gr. 1EB
ORION® = Prod. Gr. 1EH

ATORN® ORION® HSSE 90° conical countersinks with slanted hole
for universal use up to 1300 N/mm²



Application:

For producing 90° counterbores up to 1300 N/mm².

Execution:

- profile-ground single-edge countersink with slanted hole

Advantage:

- slanted continuous hole improves chip removal
- No. 11516:** TiN coating for increased requirements in service life
- No. 11516 010, 11516 020, 11516 030, 11516 040, 11516 050:** precision grinding for the most demanding requirements in terms of dimensional accuracy



No. 11515
HSSE



No. 11516
HSSE, TiN-coated

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11515010-050	30	20	10	8	7	40	70	60	50	40	30	30		15	8				30
11515015-055	30	20	10	8	7	40	70	60	50	40	30	30		15	8				
11516010-050	30	20	10	8	7	40	70	60	50	40	30	30		15	8				
11516015-055	30	20	10	8	7	40	70	60	50	40	30	30		15	8				

Surface	Min./max. cutting edge Ø	Surface	Surface	f steel 700 (mm/U)	ATORN®		ORION®		ATORN®		ORION®	
					Uncoated	TiN	Uncoated	TiN	TiN	TiN		
10	2-5 mm	6	45	0.12	11515... 010	•	11515... 015	•	11516... 010	•	11516... 015	•
14	5-10 mm	6	56	0.13	11515... 020	•	11515... 025	•	11516... 020	•	11516... 025	•
21	10-15 mm	10	67	0.16	11515... 030	•	11515... 035	•	11516... 030	•	11516... 035	•
28	15-20 mm	12	90	0.19	11515... 040	•	11515... 045	•	11516... 040	•	11516... 045	•
35	20-25 mm	15	106	0.23	11515... 050	•	11515... 055	•	11516... 050	•	11516... 055	•

ATORN® = Prod. Gr. 1EB
ORION® = Prod. Gr. 1EH

ATORN® ORION® 90° conical countersink set with slanted hole
for universal use up to 1300 N/mm²



Application:

For producing 90° counterbores up to 1300 N/mm².

Execution:

- profile-ground single-edge countersink with slanted hole

Advantage:

- slanted continuous hole improves chip removal



No. 11517



No. 11518

Surface	Min./max. cutting edge Ø	ATORN®		ORION®		ATORN®		ORION®	
		Uncoated	TiN	Uncoated	TiN	TiN	TiN		
Composition of set		11517... Ident. No.		11517... Ident. No.		11518... Ident. No.		11518... Ident. No.	
1 each of countersink 10/14/21/28	2-20 mm	010	•	015	•	010	•	015	•

ATORN® = Prod. Gr. 1EB
ORION® = Prod. Gr. 1EH

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11517010	30	20	10	8	7	40	70	60	50	40	30	30		15	8				
11517015	30	20	10	8	7	40	70	60	50	40	30	30		15	8				
11518010	30	20	10	8	7	40	70	60	50	40	30	30		15	8				
11518015	30	20	10	8	7	40	70	60	50	40	30	30		15	8				



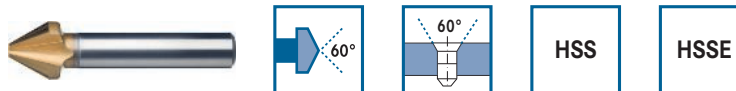
conical countersink 60° HSS / HSSE

application:

for 60° screw head countersinking or deburring holes.

advantage:

- very wide range
- many cutting materials available
- many shaft designs and shapes



ATORN® ORION® HSS 60° conical countersink, three-flute cutter
(DIN 334)
for universal use up to 1000 N/mm²



Application:

For producing 60° counterbores up to 1000 N/mm².

Execution:

- **Ident. No. 106-225:** profile-ground triple-edge countersink with radial relief

- **Ident. No. 506-725:** profile-ground triple-edge countersink with standard relief

Advantage:

- radial relief ensures optimum chip breaking
- **Ident. No. 706-725:** TiN coating for increased service life requirements



Ident. No. 106-126, 506-525



Ident. No. 206-225, 706-725

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11498106-126	30	20	10	8		40	70	60	50	40	30	30		15					
11498206-225	30	20	10	8		40	70	60	50	40	30	30		15					
11498506-525	30	20	10	8		40	70	60	50	40	30	30		15					
11498706-725	30	20	10	8		40	70	60	50	40	30	30		15					

				ATORN®				ORION®											
				Surface				Surface											
				Uncoated				TiN											
				f steel 700 (mm/U)				f steel 700 (mm/U)											
				11498... Ident. No.				11498... Ident. No.											
↓ mm	↓ mm	↓ mm	↓ mm	↓ mm	↓ mm	↓ mm	↓ mm	↓ mm	↓ mm	↓ mm	↓ mm	↓ mm	↓ mm	↓ mm	↓ mm	↓ mm	↓ mm	↓ mm	↓ mm
6.3	1.6	5	45	0.08	106	●	206	●	506	●	706	●							
8	2	6	50	0.1	108	●	208	●	508	●	708	●							
10	2.5	6	50	0.12	110	●	210	●	510	●	710	●							
12.5	3.2	8	56	0.13	112	●	212	●	512	●	712	●							
16	4	10	63	0.14	117	●	216	●	516	●	716	●							
20	5	10	67	0.16	121	●	220	●	520	●	720	●							
25	6.3	10	71	0.18	126	●	225	●	525	●	725	●							

ATORN® = Prod. Gr. 1EB
ORION® = Prod. Gr. 1EH

ATORN® ORION® HSSE 60° conical countersink set, three-flute cutter

(DIN 334)

for universal use up to 1000 N/mm²



Application:
For producing 60° counterbores up to 1000 N/mm².

▪ Ident. No. 905, 915, 925, 935: profile-ground triple-edge countersink with standard relief

Execution:

▪ Ident. No. 900, 910, 920, 930: profile-ground triple-edge countersink with radial relief

Advantage:

▪ radial relief ensures optimum chip breaking



Ident. No. 900-905, 910-915, 920-925



Ident. No. 910-915, 930

		ATORN®		ORION®		ATORN®		ORION®	
Cutting material		HSS		HSS		HSS		HSS	
Surface		Uncoated		Uncoated		TiN		TiN	
Composition of set		11498... Ident. No.		11498... Ident. No.		11498... Ident. No.		11498... Ident. No.	
Number of pieces in assortment/set (PCS)		5		7		5		7	
8.0/10.0/12.5/16.0/20.0	5	900	●	905	●	910	●	915	●
6.3/8.0/10.0/12.5/16.0/20.0/25.0	7	920	●	925	●	930	●	935	●

ATORN® = Prod. Gr. 1EB
ORION = Prod. Gr. 1EH

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)/FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11498900	30	20	10	8		40	70	60	50	40	30	30		15					
11498905	30	20	10	8		40	70	60	50	40	30	30		15					
11498910	30	20	10	8		40	70	60	50	40	30	30		15					
11498915	30	20	10	8		40	70	60	50	40	30	30		15					
11498920	30	20	10	8		40	70	60	50	40	30	30		15					
11498925	30	20	10	8		40	70	60	50	40	30	30		15					
11498930	30	20	10	8		40	70	60	50	40	30	30		15					
11498935	30	20	10	8		40	70	60	50	40	30	30		15					

ATORN® ORION® HSSE 60° conical countersink, single-flute cutter

for universal use up to 1300 N/mm²



Application:
For producing 60° counterbores up to 1300 N/mm².

Advantage:

- radial relief ensures optimum chip breaking
- deep and wide flute provides optimum chip removal
- Ident. No. 405-430: special geometry ensures vibration-free and accurate countersinking with high finish quality



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)/FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11497405-430	30	20	10	8		40	70	60	50	40	30	30		15	8				
11497705-730	30	20	10	8		40	70	60	50	40	30	30		15	8				

mm	Min./max. cutting edge Ø	mm	mm	f steel 1000 ● (mm/U)	ATORN®		ORION®	
					11497... Ident. No.	●	11497... Ident. No.	●
5	1-5 mm	5	50	0.07	405	●	705	●
10	1-10 mm	10	60	0.12	410	●	710	●
15	2-15 mm	10	65	0.14	415	●	715	●
20	2-20 mm	10	73	0.16	420	●	720	●
25	2-25 mm	10	80	0.16	425	●	-	-
30	3-30 mm	12	82	0.2	430	●	730	●

ATORN® = Prod. Gr. 1EB
ORION = Prod. Gr. 1EH



conical countersink HSS 120°

application:

for 120° screw head countersinking or deburring holes.



ATORN® ORION® HSS 120° conical countersinks

for universal use up to 1000 N/mm²



Application:

For producing 120° counterbores up to 1000 N/mm².

Execution:

- profile-ground triple-edge countersink with radial relief

Advantage:

- radial relief ensures optimum chip breaking



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11502106-126	30	20	10	10		40	70	60	50	40	30	30		15					
11502306-325	30	20	10	10		40	70	60	50	40	30	30		15					

Surface	ATORN®		ORION®	
	Uncoated Ident. No.	11502... Ident. No.	Uncoated Ident. No.	11502... Ident. No.
f steel 700 ● (mm/U)				
↓ mm	6.3	1.5	6	49
↓ mm	8	2	6	49
↓ mm	12.5	2.8	8	54
↓ mm	16	3.2	10	57
↓ mm	20	3.5	10	59
↓ mm	25	3.8	10	63
0.1	106	●	306	●
0.1	108	●	308	●
0.13	112	●	312	●
0.14	117	●	316	●
0.16	120	●	320	●
0.18	126	●	325	●

ATORN® = Prod. Gr. 1EB
ORION = Prod. Gr. 1EH

ATORN® ORION® Hand deburrers 90° HSS

With 3 flutes



Application:

For producing 90° counterbores and for deburring up to 1000 N/mm².

Advantage:

- radial relief ensures optimum chip breaking
- Ident. No. 111-125:**
 - innovative cutting geometry provides excellent cutting performance and good finish quality
 - ergonomic plastic handle ensures good power transmission



Ident. No. 111-125

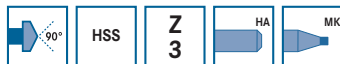
Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11511111-125	●	●	○	○		●	●	●	●	●	●	●	○	○					
11511211-225	●	●	○	○		●	●	●	●	●	●	●	○	○					

Spot-facer Ø (mm)	ATORN®		ORION®	
	11511... Ident. No.	11511... Ident. No.	11511... Ident. No.	11511... Ident. No.
11.5	111	●	211	●
12.4	112	●	212	●
15	115	●	215	●
16.5	116	●	216	●
19	119	●	219	●
20.5	120	●	220	●
23	123	●	223	●
25	125	●	225	●

ATORN® = Prod. Gr. 1EB
ORION = Prod. Gr. 1EH

ORION® HSS 90° pipe deburrers

With straight or Morse taper shank



Application:

For manufacturing external and internal pipe deburrers in the steel, stainless steel, NF metal and (cast) material groups up to a strength of 1000 N/mm² in single part production.

Execution:

- Profile-ground three-cutter counterbore and ground external counterbore for high requirements for dimensional accuracy and process reliability

Advantage:

- Axially adjustable internal conical countersink for stepless adjustment to pipe diameter and wall thickness
- 6 cutters ensure the surface is smooth and chatter-free
- The two counterbore sections come apart for easy sharpening



Ident. No. 160-320



Ident. No. 500-660

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
11513160-320	●	○				●	○	●	●	●	●	○		○						
11513500-660	●	○				●	○	●	●	●	●	○		○						

Construction size	Suitable for min./max. pipe outer Ø	Suitable for min./max. pipe internal Ø	Morse taper size	Tool holding device Shaft Ø (mm)	HA parallel shank		Morse taper shank	
					11513... Ident. No.	●	○	11513... Ident. No.
1	6.0-12.0 mm	2.0-5.4 mm	-	12.5	160	●	-	-
2	7.0-14.0 mm	2.6-7.8 mm	-	12.5	180	●	-	-
3	9.0-20.0 mm	3.6-12.8 mm	-	16	240	●	-	-
4	16.0-27.0 mm	4.6-24.0 mm	-	16	320	●	-	-
5	25.0-44.0 mm	20.0-39.0 mm	MK 2	-	-	-	-	500 ●
6	41.0-60.0 mm	36.0-55.0 mm	MK 3	-	-	-	-	660 ●

Prod. Gr. 1EH

ATORN® ORION® Solid carbide 90° deburrer



Application:

For producing chamfers and for deburring up to 1300 N/mm².

Execution:

- Solid carbide deburring tool with universal precision grinding

Advantage:

- Ident. No. 040-121:**
 - Cutting edge treatment minimises micro-fractures
 - very good surface quality and dimensional accuracy
- Ident. No. 140-221:** universal tool with an outstanding price-performance ratio

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11538040-120	60	45	35	40	30	140	180	100	80	70	60	55	40	50	20	15	15		
11538041-121	60	45	35	40	30	140	180	100	80	70	60	55	40	50	20	15	15		
11538140-220	60	45	35	40	30	140	180	100	80	70	60	55	40	50	20	15	15		
11538141-221	60	45	35	40	30	140	180	100	80	70	60	55	40	50	20	15	15		

Spot-facer Ø (mm)	Countersink angle (Degree)	Length (mm)	Shaft Ø (mm)	Surface f steel 1000 (mm/U)	ATORN®		ORION®	
					Uncoated Ident. No.	TiAlN Ident. No.	Uncoated Ident. No.	TiAlN Ident. No.
4	90	54	4	0.02	040 ●	041 ●	140 ●	141 ●
6	90	57	6	0.03	060 ●	061 ●	160 ●	161 ●
8	90	63	8	0.05	080 ●	081 ●	180 ●	181 ●
10	90	72	10	0.06	100 ●	101 ●	200 ●	201 ●
12	90	83	12	0.08	120 ●	121 ●	220 ●	221 ●

ORION = Prod. Gr. 103
ATORN = Prod. Gr. 114

ATORN® ORION® Solid carbide 60° deburrer**Application:**

Ident. No. 040-140, 160, 180, 200, 220: For producing chamfers and for deburring up to 1300 N/mm².

Ident. No. 141, 161, 181, 201, 221: For producing chamfers and for deburring workpieces up to 1300 N/mm².

Execution:

- Solid carbide deburring tool with universal precision grinding

Advantage:

- **Ident. No. 040-121:**
 - Cutting edge treatment minimises micro-fractures
 - very good surface quality and dimensional accuracy
- **Ident. No. 140-221:** universal tool with an outstanding price-performance ratio

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11537040-120	60	45	35	40	30	140	180	100	80	70	60	55	40	50	20	15	15		
11537041-121	60	45	35	40	30	140	180	100	80	70	60	55	40	50	20	15	15		
11537140-220	60	45	35	40	30	140	180	100	80	70	60	55	40	50	20	15	15		
11537141-221	60	45	35	40	30	140	180	100	80	70	60	55	40	50	20	15	15		

					ATORN®		ORION®					
Spot-facer Ø (mm)	Countersink angle (Degree)	Length (mm)	Shaft Ø (mm)	Surface f steel 1000 (mm/U)	Uncoated	TiAlN	Uncoated		TiAlN			
					11537... Ident. No.	11537... Ident. No.	11537... Ident. No.	11537... Ident. No.				
4	60	54	4	0.02	040	●	041	●	140	●	141	●
6	60	57	6	0.03	060	●	061	●	160	●	161	●
8	60	63	8	0.05	080	●	081	●	180	●	181	●
10	60	72	10	0.06	100	●	101	●	200	●	201	●
12	60	83	12	0.08	120	●	121	●	220	●	221	●

ORION = Prod. Gr. 103

ATORN® = Prod. Gr. 114

ORION® HSS 90° conical countersink, for fine thread core holes (DIN 1866)
for universal use up to 1000 N/mm²**Application:**

For producing 90° counterbores of fine quality grade for thread core holes in accordance with DIN 74-1.

Advantage:

- spiral chip flutes ensure smooth cutting and the blade does not catch

Execution:

- profile-ground with spiral blade

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11480	30	20	10	10		70	80	45	40	40	40	30		15					

Suitable for screw thread	Spot-facer Ø (mm)	Tenon Ø (mm)	Shaft Ø (mm)	Length (mm)	Number of cutting edges (PCS)	11480... Ident. No.	
M3	6	2.5	5	71	3	030	●
M4	8	3.3	5	71	3	040	●
M5	10	4.2	8	80	3	050	●
M6	11.5	5.0	8	80	3	060	●
M8	15	6.8	12.5	100	3	080	●

Prod. Gr. 103

ORION® HSS 90° conical countersink, for fine through holes (DIN 1866)
for universal use up to 1000 N/mm²



Application:

For producing 90° counterbores of fine quality grade for through holes in accordance with DIN 74-1.

Advantage:

- spiral chip flutes ensure smooth cutting and the blade does not catch

Execution:

- profile-ground with spiral blade

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11483	30	20	10	10		70	80	45	40	40	40	30		15					

Suitable for screw thread	Spot-facer Ø (mm)	Tenon Ø (mm)	Shaft Ø (mm)	Length (mm)	Number of cutting edges (PCS)	11483... Ident. No.
M3	6.0	3.2	5	71	3	030 ●
M4	8.0	4.3	5	71	3	040 ●
M5	10.0	5.3	8	80	3	050 ●
M6	11.5	6.4	8	80	3	060 ●
M8	15.0	8.4	12.5	100	3	080 ●

Prod. Gr. 103

ORION® HSS 90° conical countersink, for medium through holes (DIN 1866)
for universal use up to 1000 N/mm²



Application:

For producing 90° counterbores of medium quality grade for through holes in accordance with DIN 74-1.

Advantage:

- spiral chip flutes ensure smooth cutting and the blade does not catch

Execution:

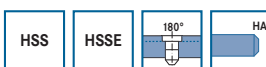
- profile-ground with spiral blade

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11489	30	20	10	10		50	80	50	40	40	35	40		20					

Suitable for screw thread	Spot-facer Ø (mm)	Tenon Ø (mm)	Shaft Ø (mm)	Length (mm)	Number of cutting edges (PCS)	11489... Ident. No.
M3	6.6	3.4	5	71	3	030 ●
M4	9.0	4.5	8	80	3	040 ●
M5	11.0	5.5	8	80	3	050 ●
M6	13.0	6.6	12.5	100	3	060 ●
M8	17.2	9.0	12.5	100	3	080 ●

Prod. Gr. 103

ORION® ATORN® Counterbore 180° (DIN 373)
For thread core holes



Application:

For producing 180° counterbores for thread core holes in accordance with DIN 74-2, types H, J, K and DIN 974-1.

Execution:

- profile-ground with spiral blade

Advantage:

- spiral chip flutes ensure smooth cutting and the blade does not catch



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11439	30	20	10	10	10	70	80	45	40	40	40	30			15	7			

						ORION®		ATORN®	
						HSS		HSSE	
						Uncoated		Uncoated	
Suitable for screw thread	Spot-facer Ø (mm)	Tenon Ø (mm)	Shaft Ø (mm)	Length (mm)	Number of cutting edges (PCS)	11438... Ident. No.	11439... Ident. No.	11438... Ident. No.	11439... Ident. No.
M3	6	2.5	5	71	3	030	030	030	030
M3	6.5	2.5	5	71	3	-	-	031	031
M4	8	3.3	5	71	3	040	040	040	040
M5	10	4.2	8	80	3	050	050	050	050
M6	11	5	8	80	3	060	060	060	060
M8	15	6.8	12.5	100	3	080	080	080	080
M10	18	8.5	12.5	100	3	100	100	100	100
M12	20	10.2	12.5	100	3	120	120	120	120

ATORN® = Prod. Gr. 1EA
ORION = Prod. Gr. 103

ORION® ATORN® Counterbore 180° (DIN 373)

For fine through hole



Application:

No. 11442-11445: For producing counterbores 180° fine quality grade for through hole to DIN 74-2, forms H, J, K and DIN 974-1.

No. 11451: For producing 180° counterbores of fine quality grade for through holes in accordance with DIN 74-2, type H, J, K and DIN 974-1.

Execution:

- profile-ground with spiral blade

Advantage:

- spiral chip flutes ensure smooth cutting and the blade does not catch
- precision grinding for highest requirements in terms of concentricity and dimensional accuracy



No. 11442-11445



No. 11451

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11442	30	20	10	10	10	70	80	45	40	40	40	30			15				
11445	30	20	10	10	10	70	80	45	40	40	40	30			15	7			
11451	30	20	10	10	10	70	80	45	40	40	40	30			15	7			

						ORION®		ATORN®			
						HSS		HSSE		HSSE	
						Uncoated		Uncoated		TiN	
Suitable for screw thread	Spot-facer Ø (mm)	Tenon Ø (mm)	Shaft Ø (mm)	Length (mm)	Number of cutting edges (PCS)	11442... Ident. No.	11445... Ident. No.	11445... Ident. No.	11451... Ident. No.	11451... Ident. No.	11451... Ident. No.
M2	4.3	2.2	4.3	56	3	020	020	-	-	-	-
M3	6	3.2	5	71	3	030	030	030	030	030	030
M3	6.5	3.2	5	71	3	-	-	031	031	031	031
M4	8	4.3	5	71	3	040	040	040	040	040	040
M5	10	5.3	8	80	3	050	050	050	050	050	050
M6	11	6.4	8	80	3	060	060	060	060	060	060
M8	15	8.4	12.5	100	3	080	080	080	080	080	080
M10	18	10.5	12.5	100	3	100	100	100	100	100	100
M12	20	13	12.5	100	3	120	120	120	120	120	120

ATORN® = Prod. Gr. 1EA
ORION = Prod. Gr. 103

ORION® ATORN® Counterbore 180° (DIN 373)

For through hole, medium quality grade



Application:

For producing 180° counterbores of medium quality grade for through holes in accordance with DIN 74-2, type H, J, K and DIN 974-1.

Execution:

- profile-ground with spiral blade

Advantage:

- spiral chip flutes ensure smooth cutting and the blade does not catch



No. 11449-11452



No. 11454

Countersinking tools \ Counterbore with fixed pilot

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11449	30	20	10	10		70	80	45	40	40	40	30		15					
11452	30	20	10	10	10	70	80	45	40	40	40	30		15	7				
11454	30	20	10	10	10	70	80	45	40	40	40	30		15	7				

						ORION		ATORN			
Cutting material						HSS		HSSE		HSSE TiN	
Surface						Uncoated		Uncoated		TiN	
Suitable for screw thread	Spot-facer Ø (mm)	Tenon Ø (mm)	Shaft Ø (mm)	Length (mm)	Number of cutting edges (PCS)	11449... Ident. No.		11452... Ident. No.		11454... Ident. No.	
M10	18	11	12.5	100	3	100	●	100	●	100	●
M12	20	13.5	12.5	100	3	120	●	120	●	120	●
M2	4.3	2.4	4.3	56	3	020	●	-	-	-	-
M3	6	3.4	5	71	3	030	●	030	●	030	●
M3	6.5	3.4	5	71	3	-	-	031	●	031	●
M4	8	4.5	5	71	3	040	●	040	●	040	●
M5	10	5.5	8	80	3	050	●	050	●	050	●
M6	11	6.6	8	80	3	060	●	060	●	060	●
M8	15	9	12.5	100	3	080	●	080	●	080	●

ATORN = Prod. Gr. 1EA
ORION = Prod. Gr. 103

ORION ATORN HSS/HSSE counterbore sets (DIN 373) In metal box



Application:

No. 11438: For producing 180° counterbores for thread core holes in accordance with DIN 74-2, types H, J, K and DIN 974-1.

No. 11439: For producing counterbores for thread core holes in accordance with DIN 74-2, types H, J, K and DIN 974-1.

No. 11442-11445: For producing 180° counterbores of fine quality grade for through holes in accordance with DIN 74-2, type H, J, K and DIN 974-1.

No. 11449-11452: For producing 180° counterbores of medium quality grade for through holes in accordance with DIN 74-2, type H, J, K and DIN 974-1.

Execution:

- profile-ground with spiral blade

Advantage:

- spiral chip flutes ensure smooth cutting and the blade does not catch

Technical data:

- Composition of set: 1 of each counterbore for M3/M4/M5/M6/M8/M10



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11438500	30	20	10	10		70	80	45	40	40	40	30		15					
11439500	30	20	10	10	10	70	80	45	40	40	40	30		15	7				
11442500	30	20	10	10		70	80	45	40	40	40	30		15					
11445500	30	20	10	10	10	70	80	45	40	40	40	30		15	7				
11449500	30	20	10	10		70	80	45	40	40	40	30		15					
11452500	30	20	10	10	10	70	80	45	40	40	40	30		15	7				

		ORION		ATORN		ORION		ATORN		ORION		ATORN	
Cutting material		HSS		HSSE		HSS		HSSE		HSS		HSSE	
Version		11438... Ident. No.		11439... Ident. No.		11442... Ident. No.		11445... Ident. No.		11449... Ident. No.		11452... Ident. No.	
For thread core hole M3/M4/M5/M6/M8/M10		500	●	500	●	-	-	-	-	-	-	-	-
For clearance hole M3/M4/M5/M6/M8/M10, fine quality grade		-	-	-	-	500	●	500	●	-	-	-	-
For clearance hole M3/M4/M5/M6/M8/M10, medium quality grade		-	-	-	-	-	-	-	-	500	●	500	●

ATORN = Prod. Gr. 1EA
ORION = Prod. Gr. 103

ORION HSS 180° counterbore, uncoated for fine through holes (DIN 373) for universal use up to 1000 N/mm²



Application:

For producing 180° counterbores of fine quality grade for through holes in accordance with DIN 74-2, type H, J, K and DIN 974-1.

Advantage:

- spiral chip flutes ensure smooth cutting and the blade does not catch
- precision grinding for high requirements on concentricity and dimensional accuracy

Execution:

- profile-ground with spiral blade

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11443	30	20	10	10		70	80	45	40	40	40	30		15	7				

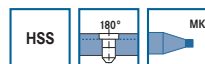
Cutting material						HSS	
Suitable for screw thread	Spot-facer Ø (mm)	Tenon Ø (mm)	Morse taper size	Length (mm)	Number of cutting edges (PCS)	11443... Ident. No.	
M10	18	10.5	MK 2	150	3	210	●



Suitable for screw thread	Spot-facer Ø (mm)	Tenon Ø (mm)	Morse taper size	Length (mm)	Cutting material		HSS	
					Number of cutting edges (PCS)	Surface	Ident. No.	Uncoated
M12	20	13	MK 2	150	3		11443...	●
M14	24	15	MK 2	160	3		212	●
M16	26	17	MK 3	190	3		216	●
M20	33	21	MK 3	190	3		220	●
M24	40	25	MK 3	205	3		224	●

Prod. Gr. 103

ORION® HSS 180° counterbore, uncoated for medium through holes
for universal use up to 1000 N/mm²



Application:

For producing 180° counterbores of medium quality grade for through holes in accordance with DIN 74-2, type H, J, K and DIN 974-1.

Execution:

- profile-ground with spiral blade

Advantage:

- spiral chip flutes ensure smooth cutting and the blade does not catch

Application No.	Steel (N/mm²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GJMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
11446	30	20	10	10		70	80	45	40	40	40	30		15						

Suitable for screw thread	Spot-facer Ø (mm)	Tenon Ø (mm)	Morse taper size	Length (mm)	Cutting material		HSS	
					Number of cutting edges (PCS)	Surface	Ident. No.	Uncoated
M10	18	11	MK 2	150	3		11446...	●
M12	20	13.5	MK 2	150	3		212	●
M14	24	15.5	MK 2	160	3		214	●
M16	26	17.5	MK 3	190	3		216	●
M20	33	22	MK 3	190	3		220	●
M24	40	26	MK 3	205	3		224	●

Prod. Gr. 103

ORION® HSS tapered cone drill set
for universal use up to 1000 N/mm²



Application:

For producing bores in thin sheets made from steel, non-ferrous metals and cast iron. Also suitable for all plastics, for hard paper and plywood, as well as all materials of similar structure and strength.

Advantage:

- Innovative cutting geometry: All bores are burr and chatter free
- User-friendly regrinding: Drills can be reground repeatedly
- No deformations even with the thinnest material thicknesses
- Robust metal box protects the tool from damage

Execution:

- Profile-ground to meet the highest requirements for dimensional accuracy and process reliability



Composition of set	Number of pieces in assortment/set (PCS)	Surface		TiN	
		Uncoated	TiN	Uncoated	TiN
Type 0/1/2 + drilling paste	4	11403... Ident. No. 010	●	11404... Ident. No. 010	●

Prod. Gr. 103

Application No.	Steel (N/mm²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GJMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
11403	●	●	○	○		●	●	●	●	●	●	●	●	●						
11404	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	○	○			

ATORN® ORION® HSS step drill with spiral
for universal use up to 1000 N/mm²



Application:

For drilling and simultaneous deburring in steel, stainless steel, non-ferrous metals and cast iron.

- No catching on the cutter and low cutting forces and torques
- High variability: A wide range of bores can be covered with just one tool

Execution:

- Profile-ground and twisted

- Ident. No. 100, 200, 300: 3-facet shank ensures good torque transfer in the chuck

Advantage:

- Twisted design ensures smooth cutting behaviour

- Ident. No. 150, 250, 350: 3-facet shank ensures good torque transfer in the chuck, TiN coating for increased service life requirements



Ident. No. 100-105, 200-205, 300-305



Ident. No. 150-155, 250-255, 350-355
Version HSS-TiN

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11405100-300	●	●	○	○		●	●	●	●	●	●	●	●	●					
11405105-305	●	●	○	○		●	●	●	●	●	●	●	●	●					
11405150-350	●	●	●	●	○	●	●	●	●	●	●	●	●	●	○				
11405155-355	●	●	●	●	○	●	●	●	●	●	●	●	●	●	○				

Type	Step Ø	Step length (mm)	Length (mm)	Shaft Ø (mm)	Surface		Uncoated		TiN		TiN	
					Plasma-nitrated	11405... Ident. No.	11405... Ident. No.	11405... Ident. No.	11405... Ident. No.			
1	4 mm 5 mm 6 mm 7 mm 8 mm 9 mm 10 mm 11 mm 12 mm	5	79	6	100	●	105	●	150	●	155	●
2	6 mm 8 mm 10 mm 12 mm 14 mm 16 mm 18 mm 20 mm	4.5	71	9	200	●	205	●	250	●	255	●
3	6 mm 8 mm 10 mm 12 mm 14 mm 16 mm 18 mm 20 mm 22 mm 24 mm 26 mm 28 mm 30 mm	4	100	10	300	●	305	●	350	●	355	●

ORION = Prod. Gr. 103
ATORN = Prod. Gr. 114

ATORN® **ORION**® Step drill set with spiral Sets in box



HSS	TiN
-----	-----

Application:
 For drilling and simultaneous deburring in steel, stainless steel, non-ferrous metals and cast iron.

Execution:
 ■ Profile-ground and twisted cutter

- Advantage:**
- Twisted design ensures smooth cutting behaviour
 - No catching on the cutter and low cutting forces and torques
 - High variability: A wide range of bores can be covered with just one tool
 - **Ident. No. 800, 900:** 3-facet shank ensures good torque transfer in the chuck



Ident. No. 900-905

Composition of set	Surface	ATORN ®		ORION ®		ATORN ®		ORION ®	
		Plasma-nitrated	11405... Ident. No.	Uncoated	11405... Ident. No.	TiN	11405... Ident. No.	TiN	11405... Ident. No.
Type 1/2/3	3	800	●	805	●	900	●	905	●

ORION = Prod. Gr. 103
ATORN = Prod. Gr. 114

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11405800	●	●	○	○		●	●	●	●	●	●	●	●	●					
11405805	●	●	○	○		●	●	●	●	●	●	●	●	●					
11405900	●	●	●	●	○	●	●	●	●	●	●	●	●	●	○				
11405905	●	●	●	●	○	●	●	●	●	●	●	●	●	●	○				

ATORN® **ORION**® HSS step drill, straight groove for universal use up to 1000 N/mm²



HSS	TiN
-----	-----

Application:
 For drilling and simultaneous deburring in steel, stainless steel, non-ferrous metals and cast iron.

Execution:
 ■ Profile-ground and straight

- Advantage:**
- High variability: A wide range of bores can be covered with just one tool
 - **Ident. No. 100, 150, 200, 250, 300, 350:** 3-facet shank ensures good torque transfer in the chuck



Ident. No. 100-105, 200-205, 300-305



Ident. No. 150-155, 250-255, 350-355



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11407100-300	●	●	○	○		●	●	●	●	●	●	●	●	●					
11407105-305	●	●	○	○		●	●	●	●	●	●	●	●	●					
11407150-350	●	●	●	●	○	●	●	●	●	●	●	●	●	●	○				
11407155-355	●	●	●	●	○	●	●	●	●	●	●	●	●	●	○				

Type	Step Ø	Step length (mm)	Length (mm)	Shaft Ø (mm)	Surface		Uncoated		Uncoated		TiN		TiN	
					11407... Ident. No.		11407... Ident. No.		11407... Ident. No.		11407... Ident. No.			
1	4 mm 5 mm 6 mm 7 mm 8 mm 9 mm 10 mm 11 mm 12 mm	5	79	6	100	●	105	●	150	●	155	●		
2	6 mm 8 mm 10 mm 12 mm 14 mm 16 mm 18 mm 20 mm	4.5	71	9	200	●	205	●	250	●	255	●		
3	6 mm 8 mm 10 mm 12 mm 14 mm 16 mm 18 mm 20 mm 22 mm 24 mm 26 mm 28 mm 30 mm	4	85	12	300	●	305	●	350	●	355	●		

ORION = Prod. Gr. 103
 ATORN® = Prod. Gr. 114

ATORN® ORION® HSS step drill set, straight groove
 for universal use up to 1000 N/mm²



HSS	TiN
-----	-----

Application:
 For drilling and simultaneous deburring up to a diameter of 30 mm and a material thickness of 5 mm in steel, stainless steel, non-ferrous metals and cast iron.

- Advantage:**
- High variability: A wide range of bores can be covered with just one tool
 - Ident. No. 800, 900: 3-facet shank ensures good torque transfer in the chuck



Ident. No. 900

Execution:

- Profile-ground and straight

Composition of set	Number of pieces in assortment/set (PCS)	ATORN®		ORION®		ATORN®		ORION®	
		Surface	Uncoated	Uncoated	TiN	TiN	TiN	TiN	
Type 1/2/3	3	800	●	805	●	900	●	905	●

ORION = Prod. Gr. 103
 ATORN® = Prod. Gr. 114

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11407800	●	●	○	○		●	●	●	●	●	●	●	●	●					
11407805	●	●	○	○		●	●	●	●	●	●	●	●	●					
11407900	●	●	●	●	○	●	●	●	●	●	●	●	●	●	○				
11407905	●	●	●	●	○	●	●	●	●	●	●	●	●	●	○				

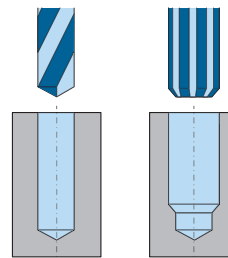


The basics of reaming

reaming is part of the precision machining process or finishing process. holes are mainly reamed in case of special requirements around surface quality, roundness, cylindricity and diameter tolerance.

set the hole with a particular allowance, see allowance table, then create the desired fit with the reamer.

Note: if not necessary, do not countersink hole due to the negative impact on the service life of the reamer.



Surfaces that can be achieved compared with other procedures

Average surface finish Ra	25	12,5	6,3	3,2	1,6	0,8	0,4	0,2	0,1	0,05	0,025		
average roughness Rz	100	63	40	25	16	10	6,3	4	2,5	1,6	1	0,63	0,25
Drilling	[Shaded]												
Drilling out	[Shaded]												
Spindles		[Shaded]											
Grinding			[Shaded]										
Sanding				[Shaded]									
Honing					[Shaded]								
Rolling									[Shaded]				

Producible

Conditionally producible



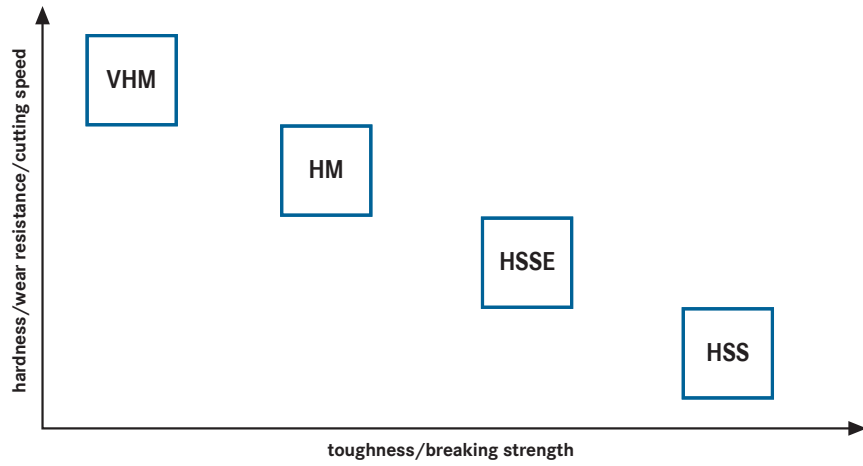


Producible surface qualities during reaming in various materials

Average surface finish Ra		25	12,5	6,3	3,2	1,6	0,8	0,4	0,2	0,1	0,05	0,025		
average roughness Rz		100	63	40	25	16	10	6,3	4	2,5	1,6	1	0,63	0,25
ISO P	low and high alloyed steels													
ISO M	Stainless steels													
ISO N	Non-ferrous metals													
ISO K	Cast metal													
ISO S	Special alloys / titanium													
ISO H	Hardened steel up to 65 HRC													



Cutting materials of reamers



- solid carbide**
 - cutting material for application up to 63 HRC
 - high cutting speed
 - high precision
- CC carrier equipped with cemented carbide**
 - high elasticity
 - high cutting speed
 - high precision
- HSSE high-speed steel**
 - cutting material for application up to 1300 N/mm²
 - small to medium cutting speeds
 - approx. 5% cobalt content
 - very high elasticity
- HSS high-speed steel**
 - cutting material for application up to 1000 N/mm²
 - low cutting speeds
 - low alloy content
 - very high elasticity



Coatings for reamers

Titanium nitride

- Long proven standard layer
- High hardness
- Very good adhesive strength
- Sufficient toughness
- Affordable universal layer
- Vickers hardness: 2200 HV
- Friction coefficient of steel: 0.5
- temperature resistance: 600°
- Colour: gold
- Coating process: PVD



Titanium carbon nitride

- Very high hardness
- High adhesive strength
- Relatively high thermal conductivity
- Low friction coefficient against steel
- Vickers hardness: 3500 HV
- Friction coefficient of steel: 0.2
- Temperature resistance: 400°
- Colour: blue-grey
- Coating process: PVD



titanium aluminium nitride

- universal layer for high-performance machining with high cutting speed
- marked thermal and chemical stability
- very high hardness
- very good heat resistance
- relatively low thermal conductivity
- Vickers hardness: 3200 HV
- friction coefficient of steel: 0.55
- temperature resistance: 900-1000°
- colour: dark blue-grey
- coating process: PVD



Titanium aluminium carbon nitride

- Universal layer for high-performance machining with high cutting speed
- Low friction
- Very high hardness
- High oxidation resistance
- Relatively low thermal conductivity
- Vickers hardness: 3500 HV
- Friction coefficient of steel: 0.20
- Temperature resistance: 800°
- Colour: antique pink
- Coating process: PVD



titanium aluminium silicon nitrides

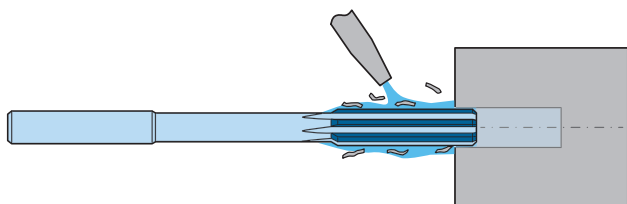
- high-performance cutting for machining very abrasive or hard materials such as steel up to 63 HRC
- very high hardness
- high wear resistance
- Vickers hardness: 3500 HV
- friction coefficient of steel: 0.70
- temperature resistance: 900°
- colour: blue-violet
- coating process: PVD



Flute shapes and applications for reamers

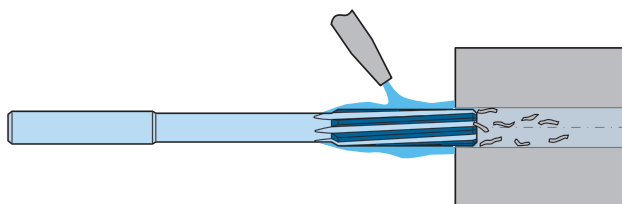
straight flute

- for blind holes
- chips are transported backwards
- larger chip angle



left-twisted flute

- For through-bores
- chips are transported forwards
- better with intermittent cuts
- reduced chip angle





Bore hole allowance when reaming

Allowance range aR	Allowance a (mm) in bore hole diameter:								
	Ø < 5 mm	Ø > 5 mm	Ø > 8 mm	Ø > 10 mm	Ø > 15 mm	Ø > 20 mm	Ø > 30 mm	Ø > 40 mm	Ø > 50 mm
A	0,1	0,1	0,1	-	0,1-0,2	0,1-0,2	-	-	-
B	0,1-0,2	0,1-0,2	0,2	0,2	0,20	0,3	0,3	0,4	0,4
C	0,1-0,2	0,2	0,25	0,2	0,3	0,3	0,4	0,4	0,4
D	0,05-0,1	0,05-0,1	0,05-0,1	0,1	0,1	0,1-0,2	-	-	-

	Material	Strength N/mm ²	DIN No.	Material No.	HSSE	Allowance ranges code			
						HSSE coated	Solid carbide/ cemented carbide	solid carbide HPC coated	

ISO P	1. Steels								
	1.1	Free machining steel	< 900	9 S 20	1.0711	B	B	B	A
	1.2	Structural steel	< 500	ST 37-2	1.0037	B	B	B	A
	1.3	Structural steel	> 500	ST 60-2	1.0060	B	B	B	A
	1.4	Heat-treated steel	<1000	42 CrMo 4	1.7225	B	B	B	A
	1.5	Cast steel	<1000	GS-45	1.0446	A	A	A	A
	1.6	Case-hardening steel	<1200	16 MnCr 5	1.7131	A	A	A	A
	1.7	Rust and acid-resistant steel and ferritic, martensitic steel casting	<1100	X 10 Cr 13	1.4006	A	A	A	A
	1.8	Heat-treated steel	>1000	43 CrMo 4	1.3563	A	A	A	A
	1.9	Nitriding steel	<1300	31 CrMoV 9	1.8519	A	A	A	A
	1.10	Tool steel (up to 45 HRC)	<1300	X 38 CrMoV 5 1	1.2343	A	A	A	A

ISO M	2. Stainless steels								
	2.1	Rust and acid-resistant steel/austenitic steel casting	<1100	G-X 2 CrNiMo 18 15	1.3953	A	A	A	A

ISO N	3. Non-ferrous metals								
	3.1	Aluminium alloy, long-chipping/ wrought alloy/pure metals/magnesium alloy	<500	Al99.9	3.0305	C	C	C	A
	3.2	Aluminium alloys, short-chipping	<500	G - AlSi12	3.2581	C	C	C	A
	3.3	Copper alloy (bronze), long-chipping	<1200	CuSn4	2.1016	C	C	C	A
	3.4	Copper alloy (bronze), short-chipping	<850	CuNi 12Zn24	2.0730	C	C	C	A
	3.5	Copper alloy (brass), long-chipping	<600	Cu Zn 20	2.0250	C	C	C	A
	3.6	Copper alloy (brass), short-chipping	<600	Cu Zn 39 Pb 3	2.0381	C	C	C	A
	3.7	Thermoplast	<100	PVC, acrylic glass	-	B	B	B	-
	3.8	Duroplast	<150	Bakelite, melamine	-	B	B	B	-
	3.9	Fibre-reinforced plastics	<1500	CFRP, GFRP	-	B	B	B	-
	3.10	Graphite	<60	C8000	-	-	-	-	-
3.11	Composite materials	-	-	-	-	-	-	-	

ISO K	4. Cast metal								
	4.1	Grey cast iron	<260	GG10	0.6010	B	B	B	A
	4.2	Ductile graphite iron	<400	GGG 40	0.7040	B	B	B	A
4.3	Malleable cast iron	<550	GTW-55	0.8055	B	B	B	A	

ISO S	5. Special alloys								
	5.1	Titanium alloys	<1200	TiAl5Sn2.5	3.7115	A	A	A	A
	5.2	Nickel-based alloys	<1400	NiCr21Mo	2.4858	B	B	B	A
5.3	Super alloys	<1300	X45CrSi 9 3	1.4718	B	B	B	A	

ISO H	6. Hard materials								
	6.1	Hardened materials - 63 HRC	>1300	G-X 260 NiCr 4 2	0.9620	-	-	-	D



Coverable tolerance classes with 1/100 reamers

with 1/100 reamers, available in increments of 0.01 mm, various fit tolerance dimensions can be catered to. the system ranges up to a diameter of 12.10mm. a brief example would be, for instance, a 1/100 reamer 11.03mm capable of producing a fit tolerance of 11.0 F8. further fit tolerance dimensions catered to are shown in the table below.

hole tolerance table for 1/100 machine reamers:

Hole Ø (mm)	C8	C9	C10	C11	CD7	D7	D8	D9	D10	D11	D12	E7	E8	E9	EF8	F7	F8	F9
1,0	1,07	1,07	1,08	1,10	1,04	1,02	1,03	-	1,04	1,06	1,08	1,02	1,02	1,03	1,02	1,01	1,01	1,02
2,0	2,07	2,07	2,08	2,10	2,04	2,02	2,03	-	2,04	2,06	2,08	2,02	2,02	2,03	2,02	2,01	2,01	2,02
3,0	3,07	3,07	3,08	3,10	3,04	3,02	3,03	-	3,04	3,06	3,08	3,02	3,02	3,03	3,02	3,01	3,01	3,02
4,0	4,08	4,09	-	-	4,05	4,04	4,04	4,05	4,06	4,08	4,10	-	4,03	4,04	4,03	-	4,02	4,03
5,0	5,08	5,09	-	-	5,05	5,04	5,04	5,05	5,06	5,08	5,10	-	5,03	5,04	5,03	-	5,02	5,03
6,0	6,08	6,09	-	-	6,05	6,04	6,04	6,05	6,06	6,08	6,10	-	6,03	6,04	6,03	-	6,02	6,03
7,0	7,09	7,10	-	-	7,06	7,05	7,05	7,06	7,08	7,10	-	7,03	7,04	7,05	7,03	7,02	7,03	-
8,0	8,09	8,10	-	-	8,06	8,05	8,05	8,06	8,08	8,10	-	8,03	8,04	8,05	8,03	8,02	8,03	-
9,0	9,09	9,10	-	-	9,06	9,05	9,05	9,06	9,08	9,10	-	9,03	9,04	9,05	9,03	9,02	9,03	-
10,0	10,09	10,10	-	-	10,06	10,05	10,05	10,06	10,08	10,10	-	10,03	10,04	10,05	10,03	10,02	10,03	-
11,0	-	-	-	-	-	11,06	-	11,08	11,10	-	-	11,04	11,05	11,06	-	-	11,03	11,04
12,0	-	-	-	-	-	12,06	-	12,08	12,10	-	-	12,04	12,05	12,06	-	-	12,03	12,04

Hole Ø (mm)	F10	G6	G7	H5	H6	H7	H8	H9	H10	H11	H12	H13	J6	J7	JS7	J8	JS8	JS9
1,0	-	-	1,01	1,00	1,00	-	1,01	-	1,02	1,04	1,06	1,09	1,00	1,00	1,00	1,00	1,00	1,00
2,0	-	-	2,01	2,00	2,00	-	2,01	-	2,02	2,04	2,06	2,09	2,00	2,00	2,00	2,00	2,00	2,00
3,0	-	-	3,01	3,00	3,00	-	3,01	-	3,02	3,04	3,06	3,09	3,00	3,00	3,00	3,00	3,00	3,00
4,0	4,04	4,01	4,01	4,00	4,00	-	4,01	4,02	4,03	4,05	4,08	-	4,00	4,00	4,00	4,00	4,00	4,00
5,0	5,04	5,01	5,01	5,00	5,00	-	5,01	5,02	5,03	5,05	5,08	-	5,00	5,00	5,00	5,00	5,00	5,00
6,0	6,04	6,01	6,01	6,00	6,00	-	6,01	6,02	6,03	6,05	6,08	-	6,00	6,00	6,00	6,00	6,00	6,00
7,0	7,05	7,01	7,01	7,00	7,00	7,01	7,01	7,02	7,04	7,06	7,10	-	7,00	7,00	7,00	7,00	7,00	-
8,0	8,05	8,01	8,01	8,00	8,00	8,01	8,01	8,02	8,04	8,06	8,10	-	8,00	8,00	8,00	8,00	8,00	-
9,0	9,05	9,01	9,01	9,00	9,00	9,01	9,01	9,02	9,04	9,06	9,10	-	9,00	9,00	9,00	9,00	9,00	-
10,0	10,05	10,01	10,01	10,00	10,00	10,01	10,02	10,02	10,04	10,06	10,10	-	10,00	10,00	10,00	10,00	10,00	-
11,0	11,06	11,01	-	11,00	-	11,01	11,02	11,03	11,05	11,07	-	-	11,00	11,00	11,00	11,00	11,00	-
12,0	12,06	12,01	-	12,00	-	12,01	12,02	12,03	12,05	12,07	-	-	12,00	12,00	12,00	12,00	12,00	-

Hole Ø (mm)	K6	K7	K8	M6	M7	M8	N6	N7	N8	P6	P7	P8	R6	R7	S6	S7	U6	U7
1,0	-	-	0,99	-	-	0,99	0,99	0,99	0,99	0,99	0,99	0,99	-	-	0,98	0,98	0,98	0,98
2,0	-	-	1,99	-	-	1,99	1,99	1,99	1,99	1,99	1,99	1,99	-	-	1,98	1,98	1,98	1,98
3,0	-	-	2,99	-	-	2,99	2,99	2,99	2,99	2,99	2,99	2,99	-	-	2,98	2,98	2,98	2,98
4,0	4,00	4,00	4,00	3,99	-	3,99	3,99	3,99	3,99	-	-	3,98	-	-	3,98	3,98	-	-
5,0	5,00	5,00	5,00	4,99	-	4,99	4,99	4,99	4,99	-	-	4,98	-	-	4,98	4,98	-	-
6,0	6,00	6,00	6,00	5,99	-	5,99	5,99	5,99	5,99	-	-	5,98	-	-	5,98	5,98	-	-
7,0	-	7,00	7,00	6,99	6,99	6,99	-	6,99	6,99	-	-	-	6,98	6,98	-	-	6,97	6,97
8,0	-	8,00	8,00	7,99	7,99	7,99	-	7,99	7,99	-	-	-	7,98	7,98	-	-	7,97	7,97
9,0	-	9,00	9,00	8,99	8,99	8,99	-	8,99	8,99	-	-	-	8,98	8,98	-	-	8,97	8,97
10,0	-	10,00	10,00	9,99	9,99	9,99	-	9,99	9,99	-	-	-	9,98	9,98	-	-	9,97	9,97
11,0	-	11,00	11,00	10,99	10,99	10,99	-	10,99	10,99	10,98	10,98	10,97	-	-	10,97	10,97	-	-
12,0	-	12,00	12,00	11,99	11,99	11,99	-	11,99	11,99	11,98	11,98	11,97	-	-	11,97	11,97	-	-

Hole Ø (mm)	X7	X8	X9	Z7	Z8	Z9	Z10	ZA7	ZA8	ZA9	ZB8	ZB9						
1,0	-	0,97	0,97	0,97	0,97	-	0,96	0,96	-	-	0,95	0,95						
2,0	-	1,97	1,97	1,97	1,97	-	1,96	1,96	-	-	1,95	1,95						
3,0	-	2,97	2,97	2,97	2,97	-	2,96	2,96	-	-	2,95	2,95						
4,0	3,97	-	3,96	3,96	3,96	3,95	3,95	3,96	-	-	3,94	3,94						
5,0	4,97	-	4,96	4,96	4,96	4,95	4,95	4,96	-	-	4,94	4,94						
6,0	5,97	-	5,96	5,96	5,96	5,95	5,95	5,96	-	-	5,94	5,94						
7,0	-	6,96	6,95	6,96	6,95	-	6,94	6,94	6,94	-	-	6,92						
8,0	-	7,96	7,95	7,96	7,95	-	7,94	7,94	7,94	-	-	7,92						
9,0	-	8,96	8,95	8,96	8,95	-	8,94	8,94	8,94	-	-	8,92						
10,0	-	9,96	9,95	9,96	9,95	-	9,94	9,94	9,94	-	-	9,92						
11,0	10,96	10,95	-	10,95	10,94	-	10,93	-	10,93	-	10,90	10,90						
12,0	11,96	11,95	-	11,95	11,94	-	11,93	-	11,93	-	11,90	11,90						



clamping device recommendation for reaming



	standard collet chucks	precision collet chucks	shrink-fit chucks	hydro-expansion chucks
concentricity	●	●	●	●
vibration-reducing	●	○	○	●
speed/balancing quality	●	●	●	●
internal cooling	yes	yes	yes	yes
flexibility	●	●	○	●
overall rating	limited suitability	highly suitable	well suited	highly suitable

● = very well suited ● = suitable ○ = limited suitability



HPC machine reamers for series applications on modern machining centres

Application:

For serial production of fit tolerances on modern CNC machines with robust clamping of tool and workpiece.

advantage:

- innovative cutting geometry ensures very high dimensional stability and process reliability at very high cutting parameters
- high-quality cemented carbide cutting material and coating make for a very long service life
- innovative coating technology ensures an increased service life
- internal cooling ensures optimal transport of chips
- wide range with specialists for the most common materials
- diameter and tolerance can be ordered individually with short delivery times
- HPC reamers available as H7, 1/100 mm and special reamers
- all geometries available for through hole and blind hole machining



H7

0,001

0,00X

VHM

		Ø	Cutting material	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	H 65HRC	
11781050-286	High-performance reamer, solid carbide, TiAlN With cast steel geometry for use up to 1300 N/mm ²	3.97-20.0 mm	VHM	●	●			●			
11781350-586	High-performance reamer, solid carbide TiAlN With cast steel geometry for use up to 1300 N/mm ²	3.97-20.0 mm	VHM	●	●			●			
11781604-628	High-performance reamer, solid carbide TiAlN (fit tolerance and diameter can be selected) With cast steel geometry for use up to 1300 N/mm ²	3.80-20.20 mm	VHM	●	●			●			
11781633-657	High-performance reamer, solid carbide TiAlN (fit tolerance and diameter can be selected) With cast steel geometry for use up to 1300 N/mm ²	3.80-20.20 mm	VHM	●	●			●			
11783604-628	High-performance reamer, solid carbide TiAlN (fit tolerance and diameter can be selected) for use in stainless steels	3.80-20.20 mm	VHM			●	○				
11783633-657	High-performance reamer, solid carbide TiAlN (fit tolerance and diameter can be selected) for use in stainless steels	3.80-20.20 mm	VHM			●	○				
11784604-628	High-performance reamer, solid carbide, TiAlN (fit and diameter may be selected) For use in hardened steels up to 63 HRC	3.80-20.20 mm	VHM							●	
11734200-292	Solid carbide TiALCN high-performance reamer for universal use up to 1300N/mm ²	3.97-20.0 mm	VHM	●	●			●			
11737200-288	Solid carbide TiALCN high-performance reamer for universal use up to 1300N/mm ²	3.97-20.0 mm	VHM	●	●			●			



solid carbide machine reamers H7
For demanding serial users

Application:

For cutting H7 fit tolerances on conventional machines and CNC machines.

advantage:

- universal range of diameters from 1.00 mm to 20.00 mm
- various types of reamers
- very long service life
- high cutting values can be realised
- precisely ground in accordance with DIN 1420
- more dimensions available on request



		Ø	Cutting material	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	H 65HRC	
11784700-800	SC TiAlSiN reamer For high-strength steels and hard machining up to 63 HRC	2.97-12.03 mm	VHM	○	●	○		○		●	
11726010-200	NC machine reamer, solid carbide with universal shank for universal use up to 1300N/mm ²	1.0-20.0 mm	VHM	●	●	○	●	●	●		
11770020-120	NC machine reamer, solid carbide For universal use up to 1300 N/mm ²	2.0-12.0 mm	VHM	●	●	○	●	●	●		
11772330-500	Automatic machine reamers, solid carbide For universal use up to 1300 N/mm ²	3.0-20.0 mm	VHM	●	●	○	●	●	●		
11772630-800	Automatic machine reamers, solid carbide For universal use up to 1300 N/mm ²	3.0-20.0 mm	VHM	●	●	○	●	●	●		
11744050-200	Carbide machine reamer for universal use up to 1300N/mm ²	5.0-20.0 mm	Carbide	●	●	○	●	●	●		
11779	machine reamer HM for universal use up to 1300 N/mm ²	5.0-32.0 mm	Carbide	●	●	○	●	●	●		



solid carbide machine reamers 1/100 mm
For demanding serial users

application:

for cutting high-precision fit tolerances (0/+0.003 mm) on conventional machines and CNC machines.

advantage:

- covers a wide range of tolerances
- manufacture of special reamers not required
- in stock
- high cutting values can be realised
- universal range of diameters from 0.90 mm to 12.03 mm
- tight tolerance for high precision (0/+0.003 mm)
- very long service life through high-quality cemented carbide cutting material



		Ø	Cutting material	P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
11730	NC machine reamer, solid carbide, with uniform shank for universal use up to 1300 N/mm ²	0.9-12.03 mm	VHM	●	●	●	○	●	●	●	



HSSE machine reamers H7

Application:

For cutting H7 fit tolerances on conventional machines and CNC machines.

advantage:

- universal range of diameters from 1.00 mm to 40.00 mm
- various types of reamers
- very long service life
- precisely ground in accordance with DIN 1420
- coated versions for higher cutting values
- more dimensions available on request



H7

HSSE

		Ø	Cutting material	P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
11628010-027	NC machine reamer HSSE with straight shank For universal use up to 1000 N/mm ²	1.0-2.7 mm	HSSE	●	●	○	○	○	●	○	
11628028-200	NC machine reamer HSSE with straight shank For universal use up to 1000 N/mm ²	20.0-2.8 mm	HSSE	●	●	○	○	○	●	○	
11630010-025	Machine reamer HSSE for universal use up to 1000N/mm ²	1.0-2.5 mm	HSSE	●	●	○	○	○	●	○	
11630030-200	Machine reamer HSSE for universal use up to 1000N/mm ²	3.0-20.0 mm	HSSE	●	●	○	○	○	●	○	
11628330-420	NC machine reamer HSSE-TiN with straight shank For universal use up to 1300 N/mm ²	3.0-12.0 mm	HSSE	●	●	●	○	○	●	○	
11628630-720	NC machine reamer HSSE-TiAlN with straight shank For universal use up to 1300 N/mm ²	3.0-12.0 mm	HSSE	●	●	○	○	○	●	○	
11626040-200	HSSE automated machine reamer for universal use up to 1000N/mm ²	4.0-20.0 mm	HSSE	●	●	○	○	○	●	○	
11627020-120	Machine reamer, extra-long, HSSE for universal use up to 1000N/mm ²	2.0-12.0 mm	HSSE	●	●	○	○	○	●	○	
11646030-120	Machine bottoming reamer, HSSE For universal use up to 1000 N/mm ²	3.0-12.0 mm	HSSE	●	●	○	○	○	●	○	
11643125-300	Machine reamer, extra-long, HSSE for universal use up to 1000N/mm ²	12.0-30.0 mm	HSSE	●	●	○	○	○	●	○	
11642030-400	Machine reamer HSSE for universal use up to 1000N/mm ²	3.0-40.0 mm	HSSE	●	●	○	○	○	●	○	



HSSE machine reamers 1/100 mm

application:

for cutting high-precision fit tolerances (0/+0.003 mm) on conventional machines and CNC machines.

advantage:

- covers a wide range of tolerances
- manufacture of special reamers not required
- in stock
- universal range of diameters from 0.90 mm to 12.03 mm
- tight tolerance for high precision (0/+0.003 mm)
- cheaper alternative to solid carbide tools



0,001

HSSE

		Ø	Cutting material	P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
11624100-203	NC machine reamer 1/100 mm HSSE with universal shaft For universal use up to 1000 N/mm ²	1.0-2.03 mm	HSSE	●	●	○	○	○	●	○	
11624298-019	HSSE NC machine reamer 1/100 mm with uniform shank For universal use up to 1000 N/mm ²	2.47-12.03 mm	HSSE	●	●	○	○	○	●	○	



solid carbide machine reamers with selectable diameter and fit
For demanding serial users

application:

for cutting individually selectable fit tolerances on conventional machines and CNC machines.

advantage:

- wide range of diameters from 0.95 mm to 20.00 mm
- individually selectable diameter and tolerance
- short delivery times
- high cutting values can be realised
- very long service life
- precisely ground in accordance with DIN 1420
- universal application



0,00X

VHM

		Ø	Cutting material	P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
11730950-987	NC machine reamer, solid carbide, with uniform shank (fit tolerance and diameter can be selected) for universal use up to 1300 N/mm ²	0.95-20.02 mm	VHM	●	●	●	○	●	●	●	
11731500-576	NC machine reamer, solid carbide, with uniform shank (diameter can be selected) for universal use up to 1300 N/mm ²	0.95-12.20 mm	VHM	●	●	●	○	●	●	●	
11731500-576	NC machine reamer, solid carbide, with uniform shank (diameter can be selected) for universal use up to 1300 N/mm ²	0.95-12.05 mm	VHM	●	●	●	○	●	●	●	



HSSE machine reamers with selectable diameter and fit

application:

for cutting individually selectable fit tolerances on conventional machines and CNC machines.

advantage:

- wide range of diameters from 0.95 mm to 20.00 mm
- individually selectable diameter and tolerance
- short delivery times
- very long service life
- precisely ground in accordance with DIN 1420
- universal application



0,00X

HSSE

		Ø	Cutting material	P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
11624911-995	HSSE NC machine reamer with uniform shank (fit tolerance and diameter can be selected) For universal use up to 1000 N/mm ²	0.95-20.0 mm	HSSE	●	●	○	○	○	●	○	
11625500-564	HSSE NC machine reamer with uniform shank (diameter can be selected) for universal use up to 1000 N/mm ²	0.95-12.05 mm	HSSE	●	●	○	○	○	●	○	



HSS / HSSE rivet hole reamers and machine taper reamers

application:

for the production of conical tolerances for tapered pins and rivet holes on conventional and CNC machines.

advantage:

- wide range
- very good surfaces can be achieved
- various shaft variants
- very high feed rates can be realised
- further dimensions available on request



HSS

HSSE

		Ø	Cutting material	P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
11670100-300	Rivet hole reamer, HSS for universal use up to 1000N/mm ²	10.0-30.0 mm	HSS	●	●	○	○	○	●	○	
11674	Machine taper shell reamer HSS 1:50 For universal use up to 1000 N/mm ²	1.5-12.0 mm	HSSE	●	●	○	○	○	●	○	
11678	Machine taper shell reamer HSS 1:50 For universal use up to 1000 N/mm ²	1.5-12.0 mm	HSSE	●	●	○	○	○	●	○	
11675	Machine taper shell reamer HSS 1:50 for universal use up to 1000 N/mm ²	8.0-25.0 mm	HSS	●	●	○	○	○	●	○	



HSS hand reamers

application:

for manually producing H7 or 1/100 tolerances and reworking existing tolerances

advantage:

- cost-effective alternative for manual work
- longer threaded start to correctly align the reamer
- Adjustable variants
- straight and spiralised versions
- square shaft serves as carrier
- universal application



HSS

H7

0,001

		Ø	Cutting material	P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
11602	HSS hand reamer for universal use up to 1000N/mm ²	1.5-40.0 mm	HSS	●	●	○	○	○	○	○	
11603	HSS hand reamer for universal use up to 1000N/mm ²	2.0-20.0 mm	HSS	●	●	○	○	○	○	○	
11604	HSS hand reamer for universal use up to 1000N/mm ²	1.5-40.0 mm	HSS	●	●	○	○	○	○	○	
11606	Adjustable HSS hand reamer for universal use up to 1000N/mm ²	6.0-30.0 mm	HSS	●	●	○	○	○	○	○	
11610	Quick-adjustment reamer for universal use up to 1000N/mm ²	6.4-55.0 mm	HSS	●	●	○	○	○	○	○	
11672015-120	HSS hand taper reamers 1:50 for universal use up to 1000N/mm ²	1.5-12.0 mm	HSS	●	●	○	○	○	○	○	
11673030-200	HSS hand taper reamers 1:50 for universal use up to 1000N/mm ²	3.0-20.0 mm	HSS	●	●	○	○	○	○	○	
11672301-328	HSS hand taper reamers 1:10 for universal use up to 1000N/mm ²	3.0-45.0 mm	HSS	●	●	○	○	○	○	○	
11673301-328	ATORN hand taper reamer HSS 1:10, spiral	3.0-45.0 mm	HSS	●	●	○	○	○	○	○	



HPC machine reamers

for series applications on modern machining centres

Application:

For serial production of fit tolerances on modern CNC machines with robust clamping of tool and workpiece.

advantage:

- innovative cutting geometry ensures very high dimensional stability and process reliability at very high cutting parameters
- high-quality cemented carbide cutting material and coating make for a very long service life
- innovative coating technology ensures an increased service life
- internal cooling ensures optimal transport of chips
- wide range with specialists for the most common materials
- diameter and tolerance can be ordered individually with short delivery times
- HPC reamers available as H7, 1/100 mm and special reamers
- all geometries available for through hole and blind hole machining



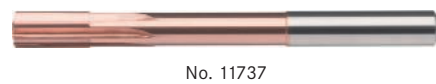
H7

0,001

0,00X

VHM

ORION® Solid carbide TiALCN high-performance reamer
for universal use up to 1300N/mm²



Application:

No. 11734: for cutting H7 fit tolerances in through holes on modern CNC machines with steady tool and workpiece clamping up to 1300 N/mm².

No. 11737: for cutting H7 fit tolerances in blind holes on modern CNC machines with steady tool and workpiece clamping up to 1300 N/mm².

Advantage:

- innovative cutting geometry ensures excellent dimensional accuracy and process reliability for very high cutting parameters
- high-quality solid carbide cutting material and coating ensure a very long service life
- Internal cooling ensures optimum chip removal

Notes:

Note: Please refer to dimension table.

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11734200-292	135	125	120											100					
11737200-288	135	125	120											100					

Groove type										Left-hand twist, 7-8°	Straight	Groove type										Left-hand twist, 7-8°	Straight												
f steel 1300 (mm/U)										11734... Ident. No.	11737... Ident. No.	f steel 1300 (mm/U)										11734... Ident. No.	11737... Ident. No.												
3.97	H7	75	12	35	6	6	0.3	200	●	200	●	7.99	H7	100	16	60	8	6	0.4	248	●	246	●	8	H7	100	16	60	8	6	0.4	250	●	248	●
3.98	H7	75	12	35	6	6	0.3	202	●	202	●	8.01	H7	100	16	60	8	6	0.4	252	●	250	●	8.02	H7	100	16	60	8	6	0.4	254	●	252	●
3.99	H7	75	12	35	6	6	0.3	204	●	204	●	8.03	H7	100	16	60	8	6	0.4	256	●	254	●	9.97	H7	120	20	76	10	6	0.6	258	●	256	●
4	H7	75	12	35	6	6	0.3	206	●	206	●	9.98	H7	120	20	76	10	6	0.6	260	●	258	●	9.99	H7	120	20	76	10	6	0.6	262	●	260	●
4.01	H7	75	12	35	6	6	0.3	208	●	208	●	10	H7	120	20	76	10	6	0.6	264	●	262	●	10.01	H7	120	20	76	10	6	0.6	266	●	264	●
4.02	H7	75	12	35	6	6	0.3	210	●	210	●	10.02	H7	120	20	76	10	6	0.6	268	●	266	●	10.03	H7	120	20	76	10	6	0.6	270	●	268	●
4.03	H7	75	12	35	6	6	0.3	212	●	212	●	10.03	H7	120	20	76	10	6	0.6	272	●	270	●	11.97	H7	120	20	71	12	6	0.6	272	●	270	●
4.97	H7	75	12	35	6	6	0.4	214	●	214	●	11.98	H7	120	20	71	12	6	0.6	274	●	272	●	11.99	H7	120	20	71	12	6	0.6	276	●	274	●
4.98	H7	75	12	35	6	6	0.4	216	●	216	●	11.99	H7	120	20	71	12	6	0.6	276	●	274	●	12	H7	120	20	71	12	6	0.6	278	●	276	●
4.99	H7	75	12	35	6	6	0.4	218	●	218	●	12.01	H7	120	20	71	12	6	0.6	280	●	278	●	12.02	H7	120	20	71	12	6	0.6	282	●	280	●
5	H7	75	12	35	6	6	0.4	220	●	220	●	12.02	H7	120	20	71	12	6	0.6	282	●	280	●	12.03	H7	120	20	71	12	6	0.6	284	●	282	●
5.01	H7	75	12	35	6	6	0.4	222	●	222	●	12.03	H7	120	20	71	12	6	0.6	284	●	282	●	14	H7	130	22	81	14	6	0.7	286	●	-	-
5.02	H7	75	12	35	6	6	0.4	224	●	224	●	14	H7	130	22	81	14	6	0.7	286	●	-	-	16	H7	150	25	98	16	6	0.8	288	●	284	●
5.03	H7	75	12	35	6	6	0.4	226	●	226	○	16	H7	150	25	98	16	6	0.8	288	●	284	●	18	H7	150	25	98	18	6	1.0	290	●	286	●
5.97	H7	75	12	35	6	6	0.4	228	●	228	●	18	H7	150	25	98	18	6	1.0	290	●	286	●	20	H7	150	25	98	20	6	1.0	292	●	288	●
5.98	H7	75	12	35	6	6	0.4	230	●	230	●																								
5.99	H7	75	12	35	6	6	0.4	232	●	232	●																								
6	H7	75	12	35	6	6	0.4	234	●	234	●																								
6.01	H7	75	12	35	6	6	0.4	236	●	236	●																								
6.02	H7	75	12	35	6	6	0.4	238	●	238	●																								
6.03	H7	75	12	35	6	6	0.4	240	●	240	●																								
7	H7	100	16	60	8	6	0.4	242	●	-	-																								
7.97	H7	100	16	60	8	6	0.4	244	●	242	●																								
7.98	H7	100	16	60	8	6	0.4	246	●	244	●																								

Prod. Gr. 1BL

i solid carbide machine reamers H7
For demanding serial users

Application:

For cutting H7 fit tolerances on conventional machines and CNC machines.

advantage:

- universal range of diameters from 1.00 mm to 20.00 mm
- various types of reamers
- very long service life
- high cutting values can be realised
- precisely ground in accordance with DIN 1420
- more dimensions available on request





								ATORN®		ORION®										ATORN®		ORION®	
Surface								Uncoated	Uncoated		Surface								Uncoated	Uncoated			
f steel 1000 (mm/U)								11628... Ident. No.	11638... Ident. No.		f steel 1000 (mm/U)								11628... Ident. No.	11638... Ident. No.			
9	H7	125	36	85	10	6	0.13	090	●	090	●	10	H7	133	38	93	10	6	0.15	100	●	100	●
9.1	H7	125	36	85	10	6	0.13	091	●	-	-	11	H7	142	41	102	10	6	0.15	110	●	110	●
9.2	H7	125	36	85	10	6	0.13	092	●	-	-	12	H7	151	44	111	10	6	0.15	120	●	120	●
9.3	H7	125	36	85	10	6	0.13	093	●	-	-	13	H7	151	44	111	10	8	0.15	130	●	130	●
9.4	H7	125	36	85	10	6	0.13	094	●	-	-	14	H7	160	47	115	14	8	0.15	140	●	140	●
9.5	H7	125	36	85	10	6	0.13	095	●	095	●	15	H7	162	50	117	14	8	0.2	150	●	150	●
9.6	H7	133	38	93	10	6	0.13	096	●	-	-	16	H7	170	52	125	14	8	0.2	160	●	160	●
9.7	H7	133	38	93	10	6	0.13	097	●	-	-	17	H7	175	54	130	14	8	0.2	170	●	170	●
9.8	H7	133	38	93	10	6	0.13	098	●	-	-	18	H7	182	56	137	14	8	0.2	180	●	180	●
9.9	H7	133	38	93	10	6	0.13	099	●	-	-	20	H7	195	60	147	16	8	0.25	200	●	200	●

ORION = Prod. Gr. 104
 ATORN® = Prod. Gr. 117

ATORN® ORION® HSSE machine reamers (DIN 212) for universal use up to 1000 N/mm²



Application:

No. 11630-11633: for cutting H7 fit tolerances in blind holes on conventional machines and NC machines up to 1000 N/mm².

No. 11634: for producing H7 fit tolerances in through holes on conventional machines and NC machines up to 1000 N/mm².

Execution:

No. 11630 010-11630 025, 11633 015-11633 025: straight design, type A, with continuous shank and lathe centre on both sides

No. 11630 030-11630 200, 11633 030-11633 160: straight design, type C, with reduced shank and centring hole on both sides

No. 11634 015-11634 025: 7-8° left-hand spiral, type B, with continuous shank and centring point on both sides

No. 11634 030-11634 200: 7-8° left-hand spiral, type D, with reduced shank and centring hole on both sides

Advantage:

good bore hole quality (dimensional tolerance, roundness, surface quality)



No. 11630

No. 11633

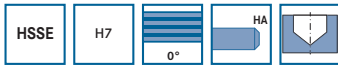
No. 11634

Application No.	Steel (N/mm²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11630010-025	12	9	7	8	7	17	17	17	17	13	13	13		11	5	5	5		
11630030-200	12	9	7	8	7	17	17	17	17	13	13	13		11	5	5	5		
11633015-025	12	9	7	8	7	17	17	17	17	13	13	13		11	5	5	5		
11633030-160	12	9	7	8	7	17	17	17	17	13	13	13		11	5	5	5		
11634015-025	12	9	7	8	7	17	17	17	17	13	13	13		11	5	5	5		
11634030-200	12	9	7	8	7	17	17	17	17	13	13	13		11	5	5	5		

								ATORN®		ORION®			
Groove type								Straight		Straight		Left-hand twist, 7-8°	
f steel 1000 (mm/U)								11630... Ident. No.	11633... Ident. No.		11634... Ident. No.		
1	H7	34	6	15	1	3	0.1	010	●	-	-	-	-
1.5	H7	40	8	18	1.5	3	0.1	015	●	015	●	015	●
2	H7	49	11	24	2	4	0.1	020	●	020	●	020	●
2.5	H7	57	14	29	2.5	4	0.1	025	●	025	●	025	●
3	H7	61	15	33	3	6	0.1	030	●	030	●	030	●
3.5	H7	70	18	42	3.5	6	0.1	-	-	035	●	035	●
4	H7	75	19	47	4	6	0.1	040	●	040	●	040	●
4.5	H7	80	21	52	4.5	6	0.1	-	-	045	●	045	●
5	H7	86	23	58	5	6	0.1	050	●	050	●	050	●
6	H7	93	26	57	5.6	6	0.1	060	●	060	●	060	●
7	H7	109	31	73	7.1	6	0.1	070	●	070	●	070	●
8	H7	117	33	81	8	6	0.15	080	●	080	●	080	●
9	H7	125	36	85	9	6	0.15	090	●	090	●	090	●
10	H7	133	38	93	10	6	0.15	100	●	100	●	100	●
11	H7	142	41	102	10	6	0.15	-	-	110	●	110	●
12	H7	151	44	111	10	6	0.15	120	●	120	●	120	●
13	H7	151	44	111	10	6	0.15	130	○	130	●	130	●
14	H7	160	47	115	12.5	8	0.15	140	●	140	●	140	●
15	H7	162	50	117	12.5	8	0.15	150	○	150	●	150	●
16	H7	170	52	125	12.5	8	0.2	160	●	160	●	160	●
17	H7	175	54	130	14	8	0.2	170	○	-	-	-	-
18	H7	182	56	137	14	8	0.2	180	○	-	-	180	●
20	H7	195	60	147	16	8	0.25	200	○	-	-	200	●

ORION = Prod. Gr. 104
 ATORN® = Prod. Gr. 117

ORION® HSSE machine bottoming reamer
for universal use up to 1000 N/mm²



Application:

for cutting H7 fit tolerances with precisely defined drill spacings (tolerance of pre-drilling counterbalanced) on conventional machines and NC machine up to 1000 N/mm². the face cut overcomes the eccentricity between the bore and tool axis and does not follow the pilot hole.

Execution:

- straight-grooved, teeth around the circumference with circular grinding chamfer to the duct

Advantage:

- good bore hole quality (dimensional tolerance, roundness, surface quality)
- a groove is inserted for each to improve the supply of coolant

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11646030-120	12	9	7	8	7	17	17	17	17	13	13	13		11	5	5	5		

mm	H7	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	z	Length of milled slots (mm)	f steel 1000 (mm/U)	11646... Ident. No.	
3	H7	61	12	33	3	4	21	0.1	030	●						
4	H7	75	16	44	4	6	28	0.1	040	●						
5	H7	86	20	53	5	6	33	0.1	050	●						
6	H7	93	20	59	6	6	39	0.1	060	●						
7	H7	109	22	69	7	6	47	0.15	070	●						
8	H7	117	24	71	8	6	47	0.15	080	●						
9	H7	125	24	77	9	6	53	0.15	090	●						
10	H7	133	26	84	10	6	58	0.15	100	●						
11	H7	142	26	89	11	6	63	0.15	110	●						
12	H7	151	26	96	12	6	70	0.2	120	●						

Prod. Gr. 104

ATORN® ORION® HSSE machine reamers (DIN 208)
for universal use up to 1000 N/mm²



Application:

No. 11636 030-11636 320, 11642 030-11642 400: for producing H7 fit tolerances in through holes on conventional machines and NC machines up to 1000 N/mm².

No. 11641: for cutting H7 fit tolerances in blind holes on conventional machines and NC machines up to 1000 N/mm².

Execution:

- No. 11636 030-11636 320, 11642 030-11642 400: 7-8° left-hand spiral, type B
- No. 11641: straight version

Advantage:

- good bore hole quality (dimensional tolerance, roundness, surface quality)



No. 11636

No. 11641

No. 11642

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11636030-320	12	9	7	8	7	17	17	17	17	13	13	13		11	5	5	5		
11641050-300	12	9	7	8	7	17	17	17	17	13	13	13		11	5	5	5		
11642030-400	12	9	7	8	7	17	17	17	17	13	13	13		11	5	5	5		

mm	H7	mm	mm	mm	mm	mm	mm	z	f steel 1000 (mm/U)	ATORN®		ORION®		Straight	
										Left-hand twist, 7-8°	Ident. No.	Left-hand twist, 7-8°	Ident. No.	Ident. No.	Ident. No.
3	H7	112	15	49.5	MK 1	6	0.1	030	●	030	●	-	-		
4	H7	125	19	59.5	MK 1	6	0.1	040	●	040	●	-	-		
5	H7	133	23	67.5	MK 1	6	0.1	050	●	050	●	050	●		
6	H7	138	26	72.5	MK 1	6	0.1	060	●	060	●	060	●		
7	H7	150	31	84.5	MK 1	6	0.1	070	●	070	●	-	-		
8	H7	156	33	90.5	MK 1	6	0.1	080	●	080	●	080	●		
9	H7	162	36	96.5	MK 1	6	0.1	-	-	090	●	090	●		
10	H7	168	38	102.5	MK 1	6	0.13	100	●	100	●	100	●		
11	H7	175	41	109.5	MK 1	6	0.15	110	●	110	●	110	●		
12	H7	182	44	116.5	MK 1	6	0.15	120	●	120	●	120	●		
13	H7	182	44	116.5	MK 1	8	0.15	130	●	130	●	130	●		
14	H7	189	47	123.5	MK 1	8	0.15	140	●	140	●	140	●		
15	H7	204	50	124	MK 2	8	0.15	150	●	150	●	150	●		
16	H7	210	52	130	MK 2	8	0.2	160	●	160	●	160	●		
17	H7	214	54	134	MK 2	8	0.2	170	●	170	●	170	●		
18	H7	219	56	139	MK 2	8	0.2	180	●	180	●	180	●		
19	H7	223	58	143	MK 2	8	0.2	190	●	190	●	190	●		
20	H7	228	60	148	MK 2	8	0.2	200	●	200	●	200	●		

								ATORN®		ORION®			
								Left-hand twist, 7-8°		Left-hand twist, 7-8°		Straight	
								11636... Ident. No.		11642... Ident. No.		11641... Ident. No.	
mm		mm	mm	mm		z	f steel 1000 (mm/U)						
21	H7	232	62	152	MK 2	8	0.2	-	-	210	●	210	●
22	H7	237	64	157	MK 2	8	0.2	220	●	220	●	220	●
23	H7	241	66	161	MK 2	8	0.25	-	-	230	●	230	●
24	H7	268	68	169	MK 3	8	0.25	240	●	240	●	240	●
25	H7	268	68	169	MK 3	10	0.25	250	●	250	●	250	●
26	H7	273	70	174	MK 3	10	0.25	260	●	260	●	260	●
27	H7	277	71	178	MK 3	10	0.25	-	-	270	●	-	-
28	H7	277	71	178	MK 3	10	0.25	280	●	280	●	280	●
29	H7	281	73	182	MK 3	10	0.25	-	-	290	●	-	-
30	H7	281	73	182	MK 3	10	0.25	300	●	300	●	300	●
32	H7	317	77	193	MK 4	12	0.3	320	●	320	●	-	-
34	H7	321	78	197	MK 4	12	0.3	-	-	340	●	-	-
35	H7	321	78	197	MK 4	12	0.3	-	-	350	●	-	-
36	H7	325	79	201	MK 4	12	0.3	-	-	360	●	-	-
38	H7	329	81	205	MK 4	12	0.3	-	-	380	●	-	-
40	H7	329	81	205	MK 4	12	0.3	-	-	400	●	-	-

ORION = Prod. Gr. 104
ATORN = Prod. Gr. 117

HSS / HSSE rivet hole reamers and machine taper reamers

application:

for the production of conical tolerances for tapered pins and rivet holes on conventional and CNC machines.

advantage:

- wide range
- very good surfaces can be achieved
- various shaft variants
- very high feed rates can be realised
- further dimensions available on request



HSS

HSSE

ORION® HSS rivet hole reamer (DIN 311) for universal use up to 1000N/mm²



Application:

For reaming rivet holes that must be perfectly aligned to one another. On both conventional machines and NC machines up to 1000 N/mm².

Advantage:

- good bore hole quality (dimensional tolerance, roundness, surface quality)
- excellent cutting performance due to stripping cut

Execution:

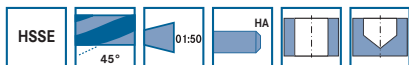
- 25° left-hand spiral, cone-shaped section 1:10 on taper lead length

Application No.	Steel (N/mm²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11670100-300	12	9	7	8	7	17	17	17	17	13	13			11	5	5			

mm	Min. Ø (mm)	Max. Ø (mm)	Lead angle length (mm)	mm	mm		z	f steel 1000 (mm/U)	11670... Ident. No.	
10	7.0	10.1	30	171	95	MK 1	4	0.15	100	●
11	7.7	11.1	33	176	100	MK 1	5	0.15	110	●
12	8.1	12.11	39	199	105	MK 2	5	0.15	120	●
13	9.1	13.11	39	199	105	MK 2	5	0.15	130	●
14	9.8	14.11	42	209	115	MK 2	5	0.15	140	●
15	10.5	15.11	45	219	125	MK 2	5	0.15	150	●
16	11.2	16.11	48	229	135	MK 2	5	0.2	160	●
17	11.9	17.11	51	251	135	MK 3	5	0.2	170	●
18	12.2	18.11	58	261	145	MK 3	5	0.2	180	●
19	13.2	19.13	58	261	145	MK 3	5	0.2	190	●
20	13.8	20.13	62	271	155	MK 3	5	0.25	200	●
21	14.8	21.13	62	271	155	MK 3	5	0.25	210	●
22	15.4	22.13	66	281	165	MK 3	5	0.25	220	●
23	16.4	23.13	66	281	165	MK 3	5	0.25	230	●
24	16.8	24.13	72	296	180	MK 3	5	0.25	240	●
25	17.8	25.13	72	296	180	MK 3	5	0.25	250	●
26	18.8	26.13	72	296	180	MK 3	5	0.25	260	●
27	19.3	27.13	78	311	195	MK 3	5	0.25	270	○
28	20.3	28.13	78	311	195	MK 3	5	0.25	280	●
30	22.3	30.13	78	311	195	MK 3	5	0.3	300	●

ATORN® ORION® High-helix taper pin machine reamers 1:50 (DIN 2179)

for universal use up to 1000 N/mm²



Application:

for cutting tapered fit tolerances 1:50 for taper pins in accordance with DIN 258, DIN EN 22339, 28737, 28736 on conventional machines and NC machines up to 1000 N/mm².

Execution:

- 45° left-hand spiral, 1:50 taper and straight shank with retaining lugs

Advantage:

- good bore hole quality (dimensional tolerance, roundness, surface quality)



No. 11674



No. 11678

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
11674	12	9	7	8	7	17	17	17	17	13	13	13		11	5	5	5		
11678	12	9	7	8	7	17	17	17	17	13	13	13		11	5	5	5		

mm	Min. Ø (mm)	Max. Ø (mm)	mm	mm	mm	z	f steel 1000 (mm/U)	ATORN®		ORION®	
								11674... Ident. No.		11678... Ident. No.	
1.5	1.4	2.14	70	37	2.1	2	0.1	015	●	-	-
2	1.9	2.86	86	48	3.15	3	0.1	020	●	020	●
2.5	2.4	3.36	86	48	3.15	3	0.1	025	●	-	-
3	2.9	4.06	100	58	4	3	0.1	030	●	030	●
4	3.9	5.26	112	68	5	3	0.1	040	●	040	●
5	4.9	6.36	122	73	6.3	3	0.1	050	●	050	●
6	5.9	8	160	105	8	3	0.1	060	●	060	●
6.5	6.4	8.78	188	119	8.5	3	0.15	065	○	-	-
8	7.9	10.8	207	145	10	3	0.15	080	●	080	●
10	9.9	13.4	245	175	12.5	3	0.2	100	●	100	●
12	11.8	16	290	210	16	3	0.2	120	●	120	●

ORION = Prod. Gr. 104
ATORN® = Prod. Gr. 117



HSS hand reamers

application:

for manually producing H7 or 1/100 tolerances and reworking existing tolerances

advantage:

- cost-effective alternative for manual work
- longer threaded start to correctly align the reamer
- Adjustable variants
- straight and spiralised versions
- square shaft serves as carrier
- universal application



HSS

H7

0,001

ATORN® ORION® Hand reamers HSS for universal use up to 1000 N/mm²



HSS

H7

Application:

No. 11602 015-11602 400, 11604 015-11604 400:

For cutting H7 fit tolerances manually in through holes or with interrupted cutting conditions up to 1000 N/mm².

No. 11603: For cutting H7 fit tolerances manually in the blind hole up to 1000 N/mm².

Execution:

- 7-8° left-hand spiral, uneven pitch and long notch shape

Advantage:

- Good bore hole quality (dimensional tolerance, roundness, surface quality)



No. 11602 015-11602 400, 11604 015-11604 400



No. 11603

Application No.	Steel (N/mm ²)		Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GJMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short							long	<55 HRC
11602	●	●	○	○	●	○	●	○	●	○	○		○	○	○			
11603	●	●	○	○	●	○	●	○	●	○	○		○	○	○			
11604	●	●	○	○	●	○	●	○	●	○	○		○	○	○			

						ATORN®		ORION®		ATORN®	
Form						B		B		A	
Groove type						Left-hand twist, 7-8°		Left-hand twist, 7-8°		Straight	
						11602... Ident. No.		11604... Ident. No.		11603... Ident. No.	
mm	H7	mm	mm	z	mm						
1.5	H7	41	20	4	1.12	015	●	015	●	-	-
2	H7	50	25	4	1.6	020	●	020	●	020	●
2.5	H7	58	29	4	2	025	●	025	●	-	-
3	H7	62	31	6	2.24	030	●	030	●	030	●
3.5	H7	71	35	6	2.8	035	●	035	●	-	-
4	H7	76	38	6	3.15	040	●	040	●	040	●
4.5	H7	81	41	6	3.55	045	●	045	●	-	-
5	H7	87	44	6	4	050	●	050	●	050	●
6	H7	93	47	6	4.5	060	●	060	●	060	●
7	H7	107	54	6	5.6	070	●	070	●	-	-
8	H7	115	58	6	6.3	080	●	080	●	080	●
9	H7	124	62	6	7.1	090	●	090	●	090	●
10	H7	133	66	6	8	100	●	100	●	100	●
11	H7	142	71	8	9	110	●	110	●	-	-
12	H7	152	76	8	10	120	●	120	●	120	●
13	H7	152	76	8	10	130	●	130	●	-	-
14	H7	163	81	8	11.2	140	●	140	●	140	●
15	H7	163	81	8	11.2	150	●	150	●	-	-
16	H7	175	87	8	12.5	160	●	160	●	160	●
17	H7	175	87	8	12.5	-	-	170	●	170	●
18	H7	188	93	8	14	180	●	180	●	180	●
19	H7	188	93	8	14	-	-	190	●	-	-
20	H7	201	100	10	16	200	●	200	●	200	●
22	H7	215	107	10	18	220	●	220	●	-	-
24	H7	231	115	10	20	240	●	240	●	-	-
25	H7	231	115	10	20	250	●	250	●	-	-
26	H7	231	115	10	20	-	-	260	●	-	-
28	H7	247	124	10	22.4	-	-	280	●	-	-
30	H7	247	124	10	22.4	300	●	300	●	-	-
32	H7	265	133	12	25	320	●	320	●	-	-
35	H7	284	142	12	28	350	●	350	●	-	-
40	H7	305	152	12	31.5	400	●	400	●	-	-

ORION = Prod. Gr. 104
ATORN = Prod. Gr. 117

ORION® Adjustable HSS hand reamer (DIN 859)

for universal use up to 1000N/mm²

**Application:**

For cutting custom fit tolerances with minimal over-size up to 1000 N/mm².

Execution:

▪ 7-8° left-hand spiral, with guide and counter-nut, from diameter 8 with slotted design, reamers are ground to the nominal size. The adjustability lies within the elasticity limits of steel and is 1/100 of the diameter.

Advantage:

- Individual cutting of fit tolerances by hand
- User-friendly adjustment

Notes:

Store reamers in untensioned state!

Adjustability:

- Ø 6 mm–10 mm approx. 0.10 mm adjustable
- Ø 11 mm–15 mm approx. 0.15 mm adjustable
- Ø 16 mm–22 mm approx. 0.20 mm adjustable
- Ø 23 mm–30 mm approx. 0.30 mm adjustable

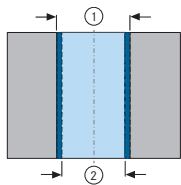
Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	>65 HRC
11606	●	●	○	○	○	●	○	●	○	●	○	○			○	○	○		

Cutting edge Ø (mm)	Length (mm)	Cutting edge length (mm)	Shank square (mm)	11606... Ident. No.	
6	93	47	4.5	060	●
7	107	54	5.6	070	●
8	115	58	6.3	080	●
9	124	62	7.1	090	●
10	133	66	8	100	●
11	142	71	9	110	●
12	152	76	10	120	●
13	152	76	10	130	●
14	163	81	11.2	140	●
15	163	81	11.2	150	●
16	175	87	12.5	160	●
17	175	87	12.5	170	●
18	188	93	14	180	●
19	188	93	14	190	●
20	201	100	16	200	●
22	215	107	18	220	●
24	231	115	20	240	●
25	231	115	20	250	●
26	231	115	20	260	○
28	247	124	22.4	280	●
30	247	124	22.4	300	●

Prod. Gr. 104



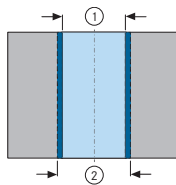
Troubleshooting when reaming



bore too large

- cutting speed too high
- tool diameter too big
- built-up edges
- reamer cut too short or uneven
- excessive amount of oil in the coolant
- radial run-out of the spindle or tool
- misalignment between drill and reamer

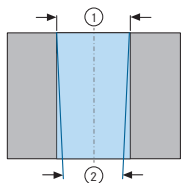
① Reaming dimension
② Nominal dimension



hole too small

- cutting speed too low
- very thin-walled workpiece
- tool wear limit reached
- insufficient reaming

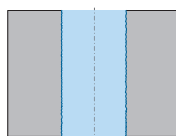
① reaming dimension ② nominal dimension



Bore hole is conical

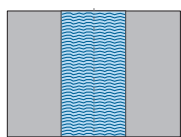
- Radial run-out of the spindle or tool
- Pre-bored hole too imprecise
- Misalignment between drill and reamer
- Incorrect angle

① Reaming dimension ② Incorrect dimension



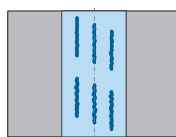
Poor surface quality

- Poor chip removal
- Cutting speed/feed too high
- Built-up edges due to insufficient or no cooling
- Breakages at the tool cutting edge
- Existing poor surface created during pre-drilling



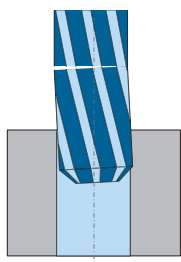
feed scoring marks in the bore hole

- breakages at the tool cutting edge
- cutting speed/feed too low
- tool wear limit reached
- built-up edges
- misalignment between drill and reamer



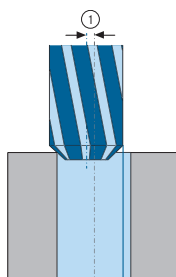
Chatter marks in the bore hole

- Built-up edges
- Insufficient amount of oil in the coolant
- Insufficient reaming
- Reamer clamped incorrectly or too loosely
- Radial run-out of the spindle or tool
- Circular grinding chamfer too narrow



Reamer grips and breaks

- Misalignment between drill and reamer
- Feed too high
- Excessive reaming
- Poor chip removal
- Circular grinding chamfer too wide
- Insufficient taper
- First cut incorrectly sanded



Incorrect bore hole position

- Misalignment between drill and reamer
- Radial run-out of the spindle or tool
- If necessary, work with bottoming reamer

① Alignment offset



**MORE THAN 60,000 PRODUCTS
FOR MAXIMUM INNOVATION.**

WE HAVE WHAT IT TAKES.

For a complete range of products that meet the toughest demands, visit www.iconridge.com



Female thread creation: Screw tapping

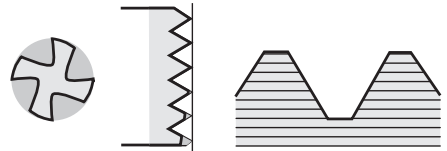
When creating a thread by tapping, a core hole and counterbore must be made in the material. The screw tap carries out the cutting motion. Thus, the thread pitch determines the feed rate. Material is cut out and the chips are removed via flutes.

Advantages:

- high machining speed
- cost-effective tools
- simple tool handling and well-known procedure
- broad field of application
- use on simple machines possible
- regrindable tools

Disadvantages:

- clamping problems with very deep threads
- screw tap breakage with difficult materials
- average surface quality
- risk of axial cutting (taper)
- of the thread
- tapping chuck required



Female thread creation: Thread forming (thread tapping)

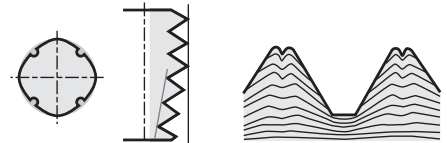
In contrast to tapping, where sections are cut out of the material, the process of thread forming does not involve cutting. The material is made to flow through the polygon shape of the thread former. The fibre pattern is not interrupted.

Advantages:

- Very high working speed and process reliability
- Very high surface quality
- One tool for through hole and blind hole
- No clamping problems
- Higher thread strength
- Tools are easier to use
- Long service life, less breakage
- Deep threads

Disadvantages:

- Higher torque
- Special pre-drilling diameter with tight tolerance
- Incomplete moulding of cores (claw)
- Minimum expansion of tool must be ensured
- Regrinding not possible
- Lubrication essential
- Where used in the food or medicine industries, there is a risk of germ build-up in the area of the moulding recess.



Female thread creation: Milling cutter

The development of computer-controlled machines has made the thread milling procedure another option for creating female threads. The thread is produced by the helical diagonal immersion of a rotating tool. In the process, the axial movement of the tool in one revolution produces the pitch. For this procedure, a CNC machine with at least three axes is required (XYZ).

Advantages, tool cost minimisation:

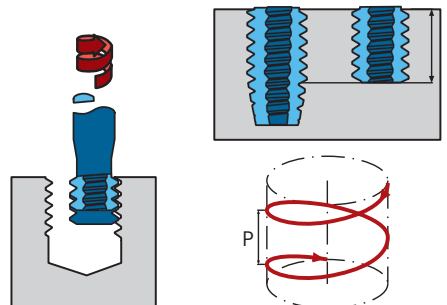
- right-hand and left-hand thread can be manufactured with a tool
- thread milling cutters cover different threads with the same pitch
- for partial thread profiles, a wide range of threads can be produced with a cutting insert

Disadvantages:

- machine requirements (XYZ axes)
- machining times generally longer in series production
- limited experience of the user in thread milling

Advantages, process reliability:

- Extremely high process reliability with very expensive components
- Reliable process solution for problem materials with poor chip breaking and difficult chip formation
- First choice with thin-walled workpieces or unstable clamping operations
- High thread quality
- Thread can be made right to the base of a blind hole
- Radius compensation programming enables thread tolerance to be adjusted easily





Thread production process at a glance

	Screw tapping	Thread forming	Milling cutter
Process reliability	○	+	++
Surface quality	○	++	+
Machining speed	+	++	○
Service life	○	++	+
Flexibility/universal use	○	+	++
Thread depth	○	++	++

○ = limited suitability | + = well suited | ++ = very well suited



Tolerances for threads



standards ensure that male and female threads of the desired form fit together. depending on the application, the appropriate tolerance must be taken into account for the screw tap or thread former. in thread milling, the tolerance can be produced as desired using radius correction. the graphic shows the different tolerance classes and their use.

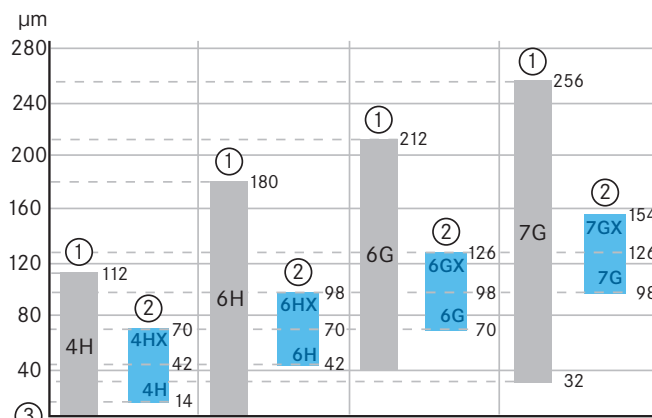
DIN EN 22857		Tolerance range of nut thread to be cut				DIN 802 part 1	Technical application
Application class of the screw tap						Tolerance class of the screw tap	
Name	Identification						
Class 1	ISO 1	4H	5H			4H	Screw connection with little play
Class 2	ISO 2			6H		6H	Standard screw connection
Class 3	ISO 3				6G	6G	Screw connection with a lot of play
-	-				7		As a preventive measure against warping in heat treatment

The graphic shows the position of the tolerance field of the nut thread in the different tolerance classes, such as 6H (highlighted in grey). The blue tolerance fields show the position of the tolerance field for the corresponding screw taps or thread formers.

It can be advantageous to produce screw taps and thread formers in a different tolerance class. This tolerance is indicated by an X after the tolerance class (e.g. 6HX instead of 6H). The X represents a manufacturer-specific tolerance and can differ between manufacturers.

Tough materials have recoiling properties. To counteract this effect, the X range is used in the ATORN thread cutting programme for these tough materials. Screw taps for titanium and nickel alloys, for example, are produced in the X range.

Where abrasive materials (those with friction or a grinding effect) are concerned, it also makes sense to produce tools in the X range. This results in a longer service life, because the screw taps are still within tolerance even having been subject to wear. The red ring screw tap for cast and short-chipping non-ferrous metals is produced in this tolerance range.



① Nut thread tolerance field ② Screw tap tolerance class ③ Tolerances



Cutting materials and cutting process during thread cutting

The following list of cutting materials is used for female thread machining in the screw tapping, thread moulding and thread milling processes. The graphic shows the toughness/breaking strength parameters in comparison to wear resistance/hardness.

SC – solid carbide

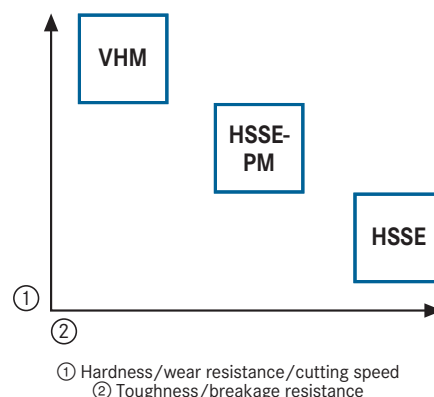
- Very high level of hardness
- Cutting material for applications up to 65 HRC
- Very high cutting speed, high precision

HSSE-PM – high speed steel, powder metal

- Cutting material for applications up to 1300 N/mm²
- Medium to high cutting speed
- High elasticity, high cutting speed

HSSE – high-speed steel

- Cutting material for applications up to 1300 N/mm²
- Low to medium cutting speeds
- 5% cobalt content
- Very high elasticity

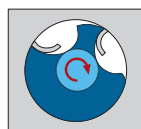


① Hardness/wear resistance/cutting speed ② Toughness/breakage resistance



Screw tapping

Screw tapping produces extremely high torsional forces. Particularly when producing blind holes in long-chipping materials, the chips must be broken at the changeover point. The following procedure for blind hole tapping illustrates the relationship.



The thread is in the cutting process and guides the chips to the top.



after reaching the thread depth the switching process follows, in which the forces return to almost zero.



The chip must now be broken off through the back of the screw tap. The forces reach maximum level.



The chip is now broken off and the torque is drastically reduced.



For this reason, primarily HSSE and HSSE-PM cutting materials are used for screw taps. These cutting materials can work with all material groups except hardened materials. Solid carbide is only used as a cutting material in a few tapping applications.

If the material hardness is too high, such as in hardened material above 55 HRC, solid carbide must be used. However, solid carbide is also used as a cutting material with short-chipping materials, since torsion forces are low in these applications. The following graphic shows the various machining tasks and the appropriate cutting material for the application.

	Steel	Stainless steel	Cast metal	Non-ferrous metals	Special alloy	Hardened steels	
HSSE	ISO P	ISO M	ISO K	ISO N			
HSSE-PM	ISO P	ISO M	ISO K	ISO N	ISO S		
VHM			ISO K	ISO N		ISO H	



Coatings and surface treatments for tapping

Coatings form a protective layer between the workpiece and the cutting tool. Through the use of coatings and surface treatments, the following properties are achieved.

- Higher wear resistance
- Increased hardness
- Higher cutting speed and feed rate
- Corrosion protection
- Reduced friction
- Higher temperature resistance

We differentiate between the following coatings and surface treatments:

titanium nitride

universal layer for universal machining.

- Vickers hardness: 2200–2300 HV
- Friction coefficient: 0.5
- Temperature resistance: 500–600°C
- Colour: Gold



Titanium aluminium nitride

Universal layer for high-performance machining with high cutting speed.

- Vickers hardness: 3200 HV
- Friction coefficient of steel: 0.55
- Temperature resistance: 700–800°C
- Colour: Dark blue grey



Titanium carbon nitride

Its high level of hardness and excellent wear resistance make the TiCN layer suitable for machining difficult materials.

- Vickers hardness: 3500 HV
- Friction coefficient of steel: 0.2
- Temperature resistance: 400°C
- Colour: Blue grey (anthracite)



ULTRA HL

This modern layer has been specially developed for thread machining and is currently the highest-performing layer due to being extremely smooth and very heat resistant while at the same time exhibiting low thermal conductivity. Particularly in processing stainless steel.

- Vickers hardness: 3000 HV
- Friction coefficient of steel: 0.15–0.20
- Temperature resistance: 800°C
- Colour: Dark grey





CARBO

A new type of special coating for high-performance machining of non-ferrous metals (aluminum alloys, wrought alloys), which are characterised by good emergency running properties and low edge build-up formation.

- Vickers hardness: 6000 HV
- Friction coefficient: 0.1
- Temperature resistance: 700°C
- Colour: Black

CARBO



Vaporisation

This is a chemical surface treatment rather than a classic coating.

This steam treatment ensures that the lubricating film on the screw tap surface does not tear off during tapping.

i Thread types and thread depths when tapping

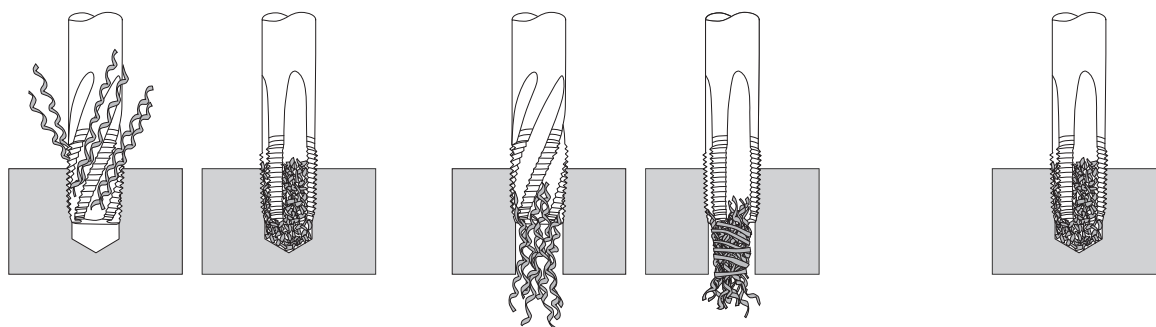
In thread machining, we distinguish between through holes and blind holes. The blind hole places the most demands on a screw tap, as the chips in long-chipping materials have to be transported upwards out of the hole and must be broken at the changeover point. As a result, spiralised screw taps must be used with long-chipping materials.

A spiralised design is not necessary with short-chipping materials, as the short chips fall into the blind hole and are rinsed out by the coolant.

As a rule, a thread depth of 3xD can be achieved in blind hole machining, depending on the material. maximum process reliability is achieved but with thread depths up to 2.5xD.

Through holes can be made with thread depths of up to 4xD. Here too, for process reliability can be expected for 3xD.

The through hole is a relatively non-critical process, as the chips are removed in the direction of feed. The chips are removed either through a spiral point or a left-hand spiral. Screw taps designed for both blind and through holes are another consideration. However, these only work with short-chipping materials or very low thread depths.



Blind hole machining with spiralised screw tap in long-chipping materials

Blind hole machining with straight-grooved screw tap in short-chipping materials

Through-hole machining with left-hand spiralised screw tap in long-chipping materials

Through-hole machining with spiral point in long-chipping materials

Blind hole and through-hole machining with straight-grooved screw tap



Max. thread depth 2.5xD of blind hole (e.g. M6 = max. thread depth 15 mm)



Max. thread depth 3xD of blind hole (e.g. M6 = max. thread depth 18 mm)



Blind and through-hole machining with straight-grooved screw tap (e.g. M6 = max. thread depth 15 mm)

i Cutting point shapes and their function

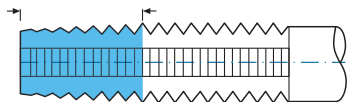


on a screw tap, the point plays an important role in the thread cutting process and is decisive when it comes to service life and thread quality.

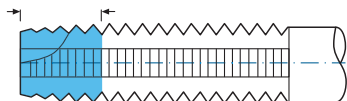
We distinguish between the following five point shapes. Apart from point shape B with a spiral point, which is only a straight-grooved shape, all other point shapes can be combined with the different chip flutes.

In principle: Longer points mean a longer service life. This a particular advantage at high quantities. However, the required torque also increases, producing higher forces. Short point shapes enable the thread to be cut nearly to the base of the hole.

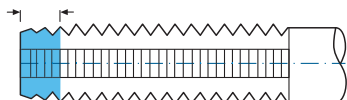
Common point shapes are B, C and E.



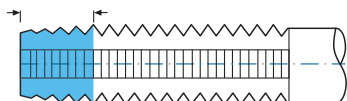
Long, 6–8 turns
for short through holes



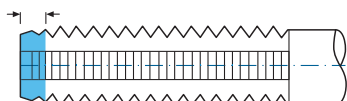
Medium, 3.5–5.5 turns
with spiral point, for all through holes and large thread depths in medium- and long-chipping materials



Short, 2–3 turns
for blind holes and generally for aluminium, grey cast iron and brass



Medium, 3.5–5 turns
for short through holes



Extremely short, 1.5–2 turns
for blind holes with a very short thread run-out; avoid if possible



Screw tapping designs

We distinguish between two fundamental designs for screw tapping. DIN 371 with reinforced shank as well as DIN 376 and DIN 374 with continuous shank.



DIN 371 reinforced shank



DIN 376 and DIN 374 protruding shank

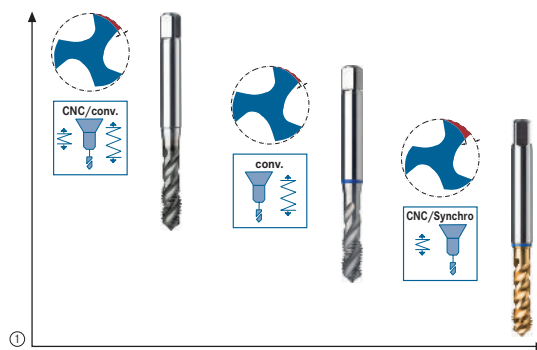


Usage conditions and clearance angle

The size of the clearance angle has an effect on the service life and guiding properties of the screw tap.

A large clearance angle minimises friction and increases the service life; a smaller clearance angle improves the guidance of the screw tap.

In principle, spiralised screw taps for blind holes have a smaller clearance angle than straight-grooved screw taps. If the clearance angle were too large, the chips would jam during the reverse motion, leading to breakage of the screw tap.



① guiding properties ② service life



CNC/conventional

These screw tap types are designed for both conventional and CNC machines, and they represent a compromise between the ideal guidance and an increase in the service life through increasing the clearance angle.

This mixed type is the most common and the best solution for the majority of machining tasks.

By moderate machining conditions, we mean e.g. cutting of threads on a CNC machine in a length compensation chuck or a synchronous chuck. With this machine tap type, for example, a thread can also be cut on a conventional drill with a length compensation chuck.



Conventional use

These threaded drill types are suitable for conventional machining in the small and medium quantity range in unstable clamping conditions. Its very long guide part and the low clearance angle make these screw taps ideal in unstable machining conditions on old machines with a standard length compensation chuck or cutting by hand.



CNC/synchro

In comparison with the conventional CNC types, these screw taps are characterised by a minimal guide part and a very large clearance angle. Their very free geometry ensures a long service life in the medium to high quantity range. However, correct tool clamping must be ensured in the synchronous chuck or as a rigidly clamped tool. In addition, the thread must be created on a synchronous CNC machine with low play. These screw taps are all equipped with an H6 shank in order that they can be clamped rigidly in a surface chuck or shrink-fit chuck.



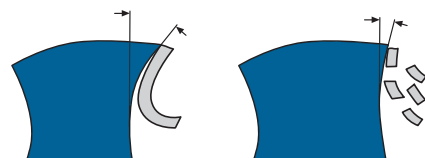
Screw tap colour ring system



the screw tap colour ring system allows the user to quickly and reliably identify the correct screw tap for the task. each colour ring represents an ideal chip geometry for the material being processed. the colour system is based on the ISO code for indexable inserts and can therefore be understood worldwide. very universal tools do not have a ring. the graphic below shows the various geometries and their purpose.

UNI MAX	UNI up to 1000 N/ mm ²	UNI up to 1000 N/ mm ²	high-strength above 1000 N/mm ²	non-ferrous metals	stainless steel	cast and short-chipping non-ferrous metals	titanium and nickel alloy	hard

each material has its specific characteristics and needs individual chip geometries. this means that the chip angle, clearance angle and guide length must be set to achieve an optimal result. stainless steels and steels need positive cutting to reliably penetrate the material and safely remove the chips. for processing very hard materials, the cutter must be as stable as possible.



Clamping device recommendation for screw taps

	Length compen- sation chuck	Synchronous tapping chuck	Collet chucks	Shrink-fit chucks	Hydro-expansion chucks	Surface chuck
Length compensation range	9-15 mm	0.5-1 mm	0	0	0	0
Suitable for usage conditions	Unstable	Unstable-stable (synchronous)	Stable (synchronous)	Stable (synchronous)	Stable (synchronous)	Stable (synchronous)
Suitable for conventional machines	●	○	○	○	○	○
Suitable for CNC machines	○	●	●	●	●	●
Suitable for conventional screw taps (low relief grinding)	●	○	○	○	○	○
Suitable for standard screw taps (medium relief grinding)	○	●	●	●	●	●
Suitable for synchronous screw taps (high relief grinding)	○	●	●	●	●	●

● = very well suited ● = suitable ○ = limited suitability



Screw tap UNI MAX 50HL Speed for universal use up to 1200 N/mm²

application:

machine tap for universal high-performance application up to 1200 N/mm² on modern CNC machines.

advantages:

- Universal application in steel, stainless steel, cast iron and non-ferrous metals ensures maximum flexibility and extremely long service life in series production
- Reduction in machining times of up to 50%
- Problem-solver for all tough stainless steels
- Innovative cutting geometry ensures reliable thread cutting even in stainless steel
- Ideal chip breaking in difficult machining conditions
- Ultra HL coating ensures extremely good sliding properties and tool life quantities



	Ø	Cutting material	Surface	Tol.	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
13201020-100	M2-M30	HSSE-PM	ULTRA HL	ISO 2X (6HX)	●	●	●	○	●	●	
13201730-800	M3-M20	HSSE-PM	ULTRA HL	ISO 3X (6GX)	●	●	●	○	●	●	
13202020-100	M2-M30	HSSE-PM	ULTRA HL	ISO 2X (6HX)	●	●	●	○	●	●	
13202730-800	M3-M20	HSSE-PM	ULTRA HL	ISO 3X (6GX)	●	●	●	○	●	●	
13202820-900	M3-M20	HSSE-PM	ULTRA HL	ISO 3X (6GX)	●	●	●	○	●	●	
13201460-500	M6-M20	HSSE-PM	ULTRA HL	ISO 2X (6HX)	●	●	●	○	●	●	
13202460-500	M6-M20	HSSE-PM	ULTRA HL	ISO 2X (6HX)	●	●	●	○	●	●	
13202520-600	M6-M20	HSSE-PM	ULTRA HL	ISO 2X (6HX)	●	●	●	○	●	●	
13211086-203	MF8-MF20	HSSE-PM	ULTRA HL	ISO 2X (6HX)	●	●	●	○	●	●	
13204086-203	MF8-MF20	HSSE-PM	ULTRA HL	ISO 2X (6HX)	●	●	●	○	●	●	
13213010-080	G 1/8-G 1 inch	HSSE-PM	ULTRA HL		●	●	●	○	●	●	
13216010-080	G 1/8-G 1 inch	HSSE-PM	ULTRA HL		●	●	●	○	●	●	



Screw tap UNI MAX 40 + 45 for universal use up to 1000 N/mm²

Application:

Machine tap for universal high-performance use up to 1000 N/mm² both on modern CNC machines and on conventional machines.

Advantages:

- Universal application in steel, stainless steel, cast iron and non-ferrous metals ensures maximum flexibility and extremely long service life in series production
- Problem-solver for all tough stainless steels
- Innovative cutting geometry ensures reliable thread cutting even in stainless steel
- Ideal chip breaking in difficult machining conditions



	Ø	Cutting material	Surface	Tol.	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
13217020-100	M2-M10	HSSE V3	Vaporised	ISO 2 (6H)	●	●	●	○	●	○	
13218020-100	M2-M10	HSSE V3	Vaporised	ISO 2 (6H)	●	●	●	○	●	○	
13218530-960	M2-M36	HSSE V3	Vaporised	ISO 2 (6H)	●	●	●	○	●	○	
13218620-700	M12-M20	HSSE V3	Vaporised	ISO 2 (6H)	●	●	●	○	●	○	
13217230-560	M3-M36	HSSE V3	Vaporised	ISO 2 (6H)	●	●	●	○	●	○	
13218230-760	M3-M36	HSSE V3	Vaporised	ISO 2 (6H)	●	●	●	○	●	○	
13219030-243	MF3-MF24	HSSE V3	Vaporised	ISO 2 (6H)	●	●	●	○	●	○	
13220030-303	MF3-MF30	HSSE V3	Vaporised	ISO 2 (6H)	●	●	●	○	●	○	
13221010-080	G 1/8-G 1 inch	HSSE V3	Vaporised		●	●	●	○	●	○	
13222010-080	G 1/8-G 1 inch	HSSE V3	Vaporised		●	●	●	○	●	○	



Screw tap UNI 40 black ring for universal use up to 1000 N/mm²

application:

machine tap for universal application up to 1000 N/mm² both on modern CNC machines and on conventional machines.

advantages:

- Universal application in steel, stainless steel, cast iron and non-ferrous metals ensures maximum flexibility
- Innovative cutting geometry provides reliable thread cutting
- Wide range of cutting materials and coatings
- Good value for money



	Ø	Cutting material	Surface	Tol.	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
13121010-100	M1-M30	HSSE	Vaporised	ISO 2 (6H)	●	○	●	○	●		
13125010-100	M1-M30	HSSE	Vaporised	ISO 2 (6H)	●	○	●	○	●		
13121430-500	M3-M20	HSSE	TiN	ISO 2 (6H)	●	○	●	○	●		
13125430-500	M3-M20	HSSE	TiN	ISO 2 (6H)	●	○	●	○	●		
13049430-500	M3-M20	HSSE	ULTRA HL	ISO 2 (6H)	●	○	●	○	●		
13049030-100	M3-M20	HSSE	ULTRA HL	ISO 2 (6H)	●	○	●	○	●		
13050730-800	M3-M20	HSSE-PM	ULTRA HL	ISO 2 (6H)	●	○	●	○	●		
13050330-400	M3-M20	HSSE-PM	ULTRA HL	ISO 2 (6H)	●	○	●	○	●		
13207310-400	G 1/8-G 1 1/4 inch	HSSE	Vaporised	ISO 2 (6H)	●	○	●	○	●		
13378310-400	G 1/8-G 1 1/4 inch	HSSE	Vaporised	ISO 2 (6H)	●	○	●	○	●		



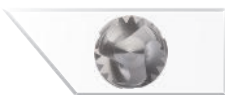
Screw tap UNI MAX 45HL Control for universal use up to 1200 N/mm²

application:

machine tap for universal application up to 1000 N/mm² both on modern CNC machines and on conventional machines.

advantages:

- Universal application in steel, stainless steel, cast iron and non-ferrous metals ensures maximum flexibility
- Problem-solver in stainless steel machining!
- Innovative cutting geometry ensures reliable thread cutting even in stainless steel
- Ultra HL coating for very long service life in stainless steel and steel
- Broad product range in MF and G threads



	Ø	Cutting material	Surface	Tol.	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
13250230-300	M3-M30	HSSE	ULTRA HL	ISO 2 (6H)	●	○	●	●	●	●	
13252230-300	M3-M30	HSSE	ULTRA HL	ISO 2 (6H)	●	○	●	●	●	●	
13103	MF6-MF24	HSSE	ULTRA HL	ISO 2 (6H)	●	○	●	●	●	●	
13315	MF6-MF24	HSSE	ULTRA HL	ISO 2 (6H)	●	○	●	●	●	●	
13208	G 1/16-G 7/8 inch	HSSE	ULTRA HL	ISO 2 (6H)	●	○	●	●	●	●	
13377	G 1/16-G 1 inch	HSSE	ULTRA HL	ISO 2 (6H)	●	○	●	●	●	●	



Screw tap UNI 40 + 50 for universal use up to 1000 N/mm²

Application:

Machine tap for universal application up to 1300 N/mm² both on modern CNC machines and on conventional machines.

Advantages:

- Universal application in steel, cast iron and non-ferrous metals, limited application in stainless steel
- Very good service life in steels and cast iron
- Wide range of cutting materials
- TiN coating for longer service life
- Wide product range, including with MF threads



	Ø	Cutting material	Surface	Tol.	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
13246020-100	M2-M36	HSSE	TiN	ISO 2 (6H)	●	○	○	●	●		
13052020-100	M2-M24	HSSE	TiN	ISO 2 (6H)	●	○	○	●	●		
13247020-100	M2-M20	HSSE-PM	TiN	ISO 2 (6H)	●	○	○	●	●		
13056030-100	M3-M20	HSSE-PM	TiN	ISO 2 (6H)	●	○	○	●	●		



Screw tap Synchro MAX 50 for universal use up to 1000 N/mm²

Application:

Machine tap for universal application up to 1000 N/mm² on modern CNC machines.

Advantages:

- Universal application in steel, cast iron, stainless steel ensures maximum flexibility
- Very good service life owing to extremely free geometry
- HSSE-PM cutting material for greater requirements on service life
- Custom clamping options owing to h6 shank design



	Ø	Cutting material	Surface	Tol.	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
13058430-500	M3-M20	HSSE-PM	TiN	ISO 2 (6H)	●		●	●	●	●	
13058030-100	M3-M20	HSSE-PM	TiN	ISO 2 (6H)	●		●	●	●	●	
13248520-600	M3-M20	HSSE-PM	TiCN	ISO 2 (6H)	●		●	●	●	●	
13060520-600	M3-M20	HSSE-PM	TiCN	ISO 2 (6H)	●		●	●	●	●	



Screw tap P Max 1000 Control for universal use up to 1000 N/mm²

Application:

Machine tap for universal application up to 1000 N/mm² optimised for use on conventional machines.

Advantages:

- Universal application in steel, cast iron and non-ferrous metals ensures maximum flexibility
- Optimised geometry for conventional application – cutting of thread minimised
- Wide product range in M, MF



	Ø	Cutting material	Surface	Tol.	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
13063	M2-M24	HSSE	Uncoated	ISO 2 (6H)	●			●	○		
13260	M3-M20	HSSE	Uncoated	ISO 2 (6H)	●			●	○		
13270020-100	M2-M36	HSSE	Uncoated	ISO 2 (6H)	●			●	○		
13100030-100	M3-M20	HSSE	Uncoated	ISO 2 (6H)	●			●	○		
13106014-100	M1,4-M24	HSSE	Uncoated	ISO 2 (6H)	●			●	○		
13267020-100	M2-M36	HSSE	Uncoated	ISO 2 (6H)	●			●	○		
13101	M1,6-M36	HSSE	Uncoated	ISO 2 (6H)	●			●	○		
13326020-100	M2-M20	HSSE	Uncoated	ISO 2 (6H)	●			●	○		



	Ø	Cutting material	Surface	ToI.	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
13320	MF3-MF36	HSSE	Uncoated	ISO 2 (6H)	●			●	○		
13144	MF3-MF40	HSSE	Uncoated	ISO 2 (6H)	●			●	○		
13335	MF8-MF20	HSSE	Uncoated	ISO 2 (6H)	●			●	○		

i Screw tap P Max 1000 for universal use up to 1000 N/mm²

Application:

Machine tap for universal application up to 1000 N/mm² both on CNC machines and on conventional machines.

Advantages:

- Universal application in steel, cast iron and non-ferrous metals ensures maximum flexibility
- Very long service life, in particular in steel materials
- Large selection of coatings
- Wide product range in M, MF, G, NPT



	Ø	Cutting material	Surface	ToI.	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
13113010-100	M1-M10	HSSE	Vaporised	ISO 2 (6H)	●			●	○		
13264020-100	M2-M20	HSSE	Vaporised	ISO 2 (6H)	●			●	○		
13115430-500	M3-M24	HSSE	TiN	ISO 2 (6H)	●			●	○		
13307030-100	M3-M20	HSSE	TiN	ISO 2 (6H)	●			●	○		
13115030-100	M3-M20	HSSE	TiCN	ISO 2 (6H)	●			●	○		
13269030-100	M3-M24	HSSE	TiCN	ISO 2 (6H)	●			●	○		
13117	M2-M36	HSSE	Vaporised	ISO 2 (6H)	●			●	○		
13283	M3-M36	HSSE	Vaporised	ISO 2 (6H)	●			●	○		
13281020-100	M2-M24	HSSE	Uncoated	ISO 2 (6H)	●			●	○		
13311	M3-M10	HSSE	Vaporised	ISO 2 (6H)	●			●	○		
13116	M3-M10	HSSE	Vaporised	ISO 3 (6G)	●			●	○		
13099030-100	M3-M10	HSSE	Vaporised	ISO 3 (6G)	●			●	○		
13108	M3 L-M10 L	HSSE	TiN	ISO 2 (6H)	●			●	○		
13113330-400	M3 L-M20 L	HSSE	TiN	ISO 2 (6H)	●			●	○		
13261	M3-M20	HSSE	Vaporised	ISO 2 (6H)	●			●	○		
13263	M4-M20	HSSE	Vaporised	ISO 2 (6H)	●			●	○		
13059	M3-M16	HSSE	Uncoated	ISO 2X (6HX)	●			●	○		
13161	MF5-MF50	HSSE	Vaporised	ISO 2 (6H)	●			●	○		
13332	MF4-MF30	HSSE	Vaporised	ISO 2 (6H)	●			●	○		
13207	G 1/8-G 1 1/4 inch	HSSE	Vaporised	ISO 2 (6H)	●			●	○		
13378	G 1/16-G 1 inch	HSSE	Vaporised	ISO 2 (6H)	●			●	○		
13228	PG 7-PG 29	HSS	Uncoated	ISO 2 (6H)	●			●	○		
13229	Tr 12-Tr 24	HSSE	Uncoated		●			○	○		
13359	NPT 1/8-NPT 1 inch	HSSE	Uncoated	ISO 2 (6H)	●			○			
13347	UNC Nr.4-UNC 3/8 inch	HSSE	Vaporised	2B	●			●	○		
13348025-110	UNC Nr.2-UNC 1 inch	HSSE	Vaporised	2B	●			●	○		
13357040-110	UNF Nr.4-UNF 5/8 inch	HSSE	Vaporised	2B	●			●	○		
13358070-110	UNF 7/16-UNF 1 inch	HSSE	Vaporised	2B	●			●	○		



Screw tap P Max 1300 for universal use up to 1300 N/mm²

Application:

Machine tap for universal application up to 1300 N/mm² both on CNC machines and on conventional machines.

Advantages:

- Very long service life in high-strength steel
- Large selection of coatings
- Wide product range in M, MF



	Ø	Cutting material	Surface	Tol.	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
13130020-100	M2-M24	HSSE	Vaporised	ISO 2 (6H)	○	●					
13306020-100	M2-M12	HSSE	Vaporised	ISO 2 (6H)	○	●					
13128030-100	M3-M20	HSSE	TiCN	ISO 2 (6H)	○	●					
13305030-100	M3-M20	HSSE	TiCN	ISO 2 (6H)	○	●					
13308	M3-M30	HSSE	Vaporised	ISO 2 (6H)	○	●					
13077030-100	M3-M10	HSSE	Vaporised	ISO 3 (6G)	○	●					
13309	M2-M10	HSSE	Vaporised	ISO 3 (6G)	○	●					



Machine tap, yellow ring, CNC/conventional For use on stainless steel

Application:

Machine tap for application in stainless steel both on CNC machines and on conventional machines.

Advantages:

- Very long service life in stainless steel
- Large selection of coatings
- Wide product range in M, MF



	Ø	Cutting material	Surface	Tol.	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
13136030-100	M3-M30	HSSE	Vaporised	ISO 2 (6H)	○		●				
13288020-100	M2-M30	HSSE	Vaporised	ISO 2 (6H)	○		●				
13107030-100	M3-M30	HSSE	TiN	ISO 2 (6H)	○		●				
13277030-100	M3-M20	HSSE	TiN	ISO 2 (6H)	○		●				
13088	M3-M10	HSSE	Uncoated	ISO 2 (6H)	○		●				
13215030-300	M3-M30	HSSE	Vaporised	ISO 2 (6H)	○		●				
13325120-300	M12-M30	HSSE	Vaporised	ISO 2 (6H)	○		●				
13274	M2-M10	HSSE	Vaporised	ISO 2 (6H)	○		●				
13143	MF4-MF50	HSSE	Vaporised	ISO 2 (6H)	○		●				
13324	MF4-MF30	HSSE	Vaporised	ISO 2 (6H)	○		●				
13360	NPT 1/8-NPT 3/4 inch	HSSE	Vaporised	ISO 2 (6H)	○		●				
13361	NPT 1/8-NPT 3/4 inch	HSSE	TiN	ISO 2 (6H)	○		●				



Machine tap, green ring, CNC/conventional

For use in non-ferrous metals

Application:

Machine tap for application in non-ferrous metals both on CNC machines and on conventional machines.

Advantages:

- Very long service life in non-ferrous metals
- Large selection of coatings and cutting materials
- CARBO coating ensures favourable sliding properties in non-ferrous metals



	Ø	Cutting material	Surface	Tol.	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
13118020-100	M2-M24	HSSE	Vaporised	ISO 2X (6HX)				●			
13266020-100	M2-M24	HSSE	Uncoated	ISO 2 (6H)				●			
13345030-100	M3-M16	HSSE-PM	Carbo coating	ISO 2 (6H)				●			
13349030-100	M3-M24	HSSE-PM	Carbo coating	ISO 2 (6H)				●			
13083030-100	M3-M16	HSSE	Uncoated	ISO 2 (6H)				●			
13254030-100	M3-M20	HSSE	Uncoated	ISO 2 (6H)				●			



Machine tap, red ring, CNC/conventional

For use in cast iron and short-chipping non-ferrous metals

Application:

Machine tap for application in stainless steel both on CNC machines and on conventional machines.

Advantages:

- Very long service life in cast iron and short-chipping non-ferrous metals
- Large selection of coatings and cutting materials
- Optimised geometry for short-chipping materials



	Ø	Cutting material	Surface	Tol.	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
13271030-100	M2-M24	HSSE	Nitrated	ISO 2 (6H)				○	●		
13290030-100	M3-M24	HSSE	TiAlN	ISO 2X (6HX)				○	●		
13291	M5-M10	HSSE	TiAlN	ISO 2X (6HX)				○	●		
13250	M3-M16	VHM	Uncoated	ISO 2 (6H)				○	●	▶	



Machine tap, brown ring, CNC/conventional

For use in titanium and nickel alloys

Application:

Machine tap in titanium and nickel alloys both on CNC machines and on conventional machines.

Advantages:

- Very long service life in titanium and nickel alloys
- High-quality cutting materials and coatings ensure long service life



	Ø	Cutting material	Surface	Tol.	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	
13134020-100	M2-M16	HSSE-PM	TiCN	ISO 2X (6HX)						○	
13286030-100	M3-M16	HSSE-PM	Vaporised	ISO 2X (6HX)						○	
13287030-100	M3-M16	HSSE-PM	TiCN	ISO 2 (6H)						○	
13203030-100	M3-M12	HSSE-PM	TiAlN	ISO 2 (6H)						○	
13313030-100	M3-M16	HSSE-PM	TiAlN	ISO 2 (6H)						○	



Machine tap, grey ring, CNC/conventional
For use in hard machining from 55-65 HRC





Application:

machine tap in hard machining both on CNC machines and on conventional machines.

Advantages:

- Very long service life in hard machining
- High-quality cutting materials and coatings ensure long service life



	Ø	Cutting material	Surface	Tol.	P 1000 N/mm ²	P 1300 N/mm ²	M	N	K	S	H 55HRC	H 65HRC	
13251030-100	M3-M12	VHM	TiCN	ISO 2X (6HX)							●	●	
13253060-100	M6-M12	HSSE-PM	TiCN	ISO 2 (6H)							●		
13152086-126	MF8-MF12	HSSE-PM	TiCN	ISO 2 (6H)							●		
13153060-126	MF6-MF12	VHM	TiCN	ISO 2 (6H)							●	●	



Screw tap P Max 1000 Control for universal use up to 1000 N/mm²

Application:

Machine tap for universal application up to 1000 N/mm² optimised for use on conventional machines.

Advantages:

- Universal application in steel, cast iron and non-ferrous metals ensures maximum flexibility
- Optimised geometry for conventional application – cutting of thread minimised
- Wide product range in M, MF



ATORN® ORION® HSS machine tap, short (DIN 352) For universal conventional use up to 1000 N/mm²



Application:

No. 13063-13064: For producing metric threads on CNC machines or conventional machines and by hand in **through holes** in the steel, (stainless steel), non-ferrous metals and (cast iron) material groups up to a strength of 1000 N/mm².

No. 13260: For producing metric threads on CNC machines or conventional machines and by hand in

blind holes in the steel, (stainless steel), non-ferrous metals and (cast iron) material groups up to a strength of 1000 N/mm².

Execution:

- Machine tap, short design

Advantage:

- Easy accessibility thanks to short design



No. 13063-13064



No. 13260

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
13063	16	11		9		18	18	15	18	15	15	13		16						
13064	15	10		9		18	18	15	18	15	15	13		16						
13260	16	11		9		18	18	15	18	15	15	13		16						

							ATORN®	ORION®	ATORN®			
Cutting material							HSSE	HSSE	HSSE			
Surface							Uncoated	Uncoated	Uncoated			
Tol.							ISO 2 (6H)	ISO 2 (6H)	ISO 2 (6H)			
Lead angle shape							B	B	C			
Application type/machine type							Conventional	Conventional	Conventional			
Twist angle							0°	0°	15° (right)			
Coolant supply							External	External	External			
DIN							13063... Ident. No.	13064... Ident. No.	13260... Ident. No.			
M2	0.4	1.6	36	2.8	2.1	352	020	●	020	●	-	-
M2.5	0.45	2.05	36	2.8	2.1	352	025	●	025	●	-	-
M3	0.5	2.5	40	3.5	2.7	352	030	●	030	●	030	●
M4	0.7	3.3	45	4.5	3.4	352	040	●	040	●	040	●
M5	0.8	4.2	50	6	4.9	352	050	●	050	●	050	●
M6	1	5	50	6	4.9	352	060	●	060	●	060	●
M8	1.25	6.8	56	6	4.9	352	080	●	080	●	080	●
M10	1.5	8.5	70	7	5.5	352	100	●	100	●	100	●
M12	1.75	10.2	75	9	7	352	120	●	120	●	120	●
M16	2	14	80	12	9	352	160	●	160	●	160	●
M18	2.5	15.5	95	14	11	352	180	●	-	-	-	-
M20	2.5	17.5	95	16	12	352	200	●	-	-	200	●
M22	2.5	19.5	100	18	14.5	352	220	●	-	-	-	-
M24	3	21	110	18	14.5	352	240	●	-	-	-	-

ORION = Prod. Gr. 1DB
ATORN = Prod. Gr. 1KA

ATORN® ORION® Machine tap, HSSE

For universal conventional use up to 1000 N/mm²



Application:

For producing metric threads on conventional machines in **blind holes and through holes** in the steel, (stainless steel), non-ferrous metals and (cast iron) material groups up to a strength of 1000 N/mm².

Execution:

- **No. 13270:** Structural dimensions according to: DIN 371 = reinforced shank (up to M10), DIN 376 = protruding shank (from M12)

- **No. 13323:** Dimensions in accordance with: DIN 371 = reinforced shank (up to M10), DIN 376 = transition-fit shank (from M12)

Advantage:

- **No. 13270:** Long service life and good process reliability due to innovative cutting geometry and universal use for maximum application versatility
- **No. 13323:** Long service life and high process reliability thanks to innovative cutting geometry, and universal use for maximum flexibility in use.

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)/FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
13270020-100	16	11		9		18	18	15	18	15	15	13		16					
13270120-360	16	11		9		18	18	15	18	15	15	13		16					
13323030-100	16	11		9		18	18	15	18	15	15	13		16					
13323120	16	11		9		18	18	15	18	15	15	13		16					

							ATORN®	ORION®		
Cutting material							HSSE	HSSE		
Surface							Uncoated	Uncoated		
Tol.							ISO 2 (6H)	ISO 2 (6H)		
Lead angle shape							C	C		
Application type/machine type							Conventional	Conventional		
Twist angle							0°	0°		
Coolant supply							External	External		
DIN							13270... Ident. No.	13323... Ident. No.		
M2	0.4	1.6	45	2.8	2.1	371	020	●	-	-
M2.5	0.45	2.05	50	2.8	2.1	371	025	●	-	-
M3	0.5	2.5	56	3.5	2.7	371	030	●	030	●
M4	0.7	3.3	63	4.5	3.4	371	040	●	040	●
M5	0.8	4.2	70	6	4.9	371	050	●	050	●
M6	1	5	80	6	4.9	371	060	●	060	●
M8	1.25	6.8	90	8	6.2	371	080	●	080	●
M10	1.5	8.5	100	10	8	371	100	●	100	●
M12	1.75	10.2	110	9	7	376	120	●	120	●
M14	2	12	110	11	9	376	140	●	-	-
M16	2	14	110	12	9	376	160	●	-	-
M18	2.5	15.5	125	14	11	376	180	●	-	-
M20	2.5	17.5	140	16	12	376	200	●	-	-
M24	3	21	160	18	14.5	376	240	●	-	-
M30	3.5	26.5	180	22	18	376	300	●	-	-
M36	4	32	200	28	22	376	360	●	-	-

ORION = Prod. Gr. 1DB
 ATORN® = Prod. Gr. 1KA

Prod. Gr. 1KA

ORION® Machine tap, HSSE

For universal conventional use up to 1000 N/mm²



No. 13105



No. 13268

Application:

No. 13105: For producing metric threads in the through hole on conventional machines for the material groups of steel (stainless steel), non-ferrous metals and (cast iron) up to a strength of 1000 N/mm².

No. 13268: For cutting metric threads in blind holes on conventional machines in the material groups steel, (stainless steel), non-ferrous metals and (cast materials) up to a strength of 1000 N/mm².

Execution:

- **No. 13105:** structural dimensions in accordance with: DIN 371 = reinforced shank (up to M10), DIN 376 = over-long shank (from M12)
- **No. 13268:** Structural dimensions according to: DIN 371 = reinforced shank (up to M10), DIN 376 = protruding shank (from M12)

Advantage:

- **No. 13105:** standard geometry with excellent price/performance ratio
- **No. 13268:** Standard geometry with very good price/performance ratio

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
13105030-100	16	11		9		18	18	15	18	15	15	13		16					
13105120	16	11		9		18	18	15	18	15	15	13		16					
13268030-100	16	12		9		18	18	15	18	15	15	13		16					
13268120	16	12		9		18	18	15	18	15	15	13		16					

Cutting material	HSSE									
	Surface	Uncoated								
Tol.	ISO 2 (6H)									
Lead angle shape	B									
Application type/machine type	Conventional	Conventional								
Twist angle	0°	40° (right)								
Coolant supply	External									
DIN	13105... Ident. No.	13268... Ident. No.								
M3	0.5	2.5	56	3.5	2.7	371	030	●	030	●
M4	0.7	3.3	63	4.5	3.4	371	040	●	040	●
M5	0.8	4.2	70	6	4.9	371	050	●	050	●
M6	1	5	80	6	4.9	371	060	●	060	●
M8	1.25	6.8	90	8	6.2	371	080	●	080	●
M10	1.5	8.5	100	10	8	371	100	●	100	●
M12	1.75	10.2	110	9	7	376	120	●	120	●

Prod. Gr. 1DB

ORION® Machine tap, HSSE, vaporised

for universal use up to 1000 N/mm²



No. 13119



No. 13318

Application:

No. 13119: For producing metric threads on CNC machines or conventional machines in **through holes** in the steel, (stainless steel), non-ferrous metals and (cast iron) material groups up to a strength of 1000 N/mm².

No. 13318: For producing metric threads on CNC machines or conventional machines in **blind holes** in the steel, (stainless steel), non-ferrous metals and (cast iron) material groups up to a strength of 1000 N/mm².

Execution:

- **No. 13119:** Dimensions to: DIN 371 = reinforced shank (to M10), DIN 376 = protruding shank (from M12)
- **No. 13318:** Dimensions in accordance with: DIN 371 = reinforced shank (up to M10), DIN 376 = transition-fit shank (from M12)

Advantage:

- **No. 13119:** Standard geometry with very good price/performance ratio
- **No. 13318:** Standard geometry with an excellent price-performance ratio

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
13119030-100	16	11		9		18	18	15	18	15	15	13		16						
13318020-100	17	12		10		19	19	17	19	17	17	15		18						
13318120	17	12		10		19	19	17	19	17	17	15		18						

Application No.	Steel (N/mm ²)	Stainless steel	Alu	Brass	Bronze	Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
												<55 HRC	<65 HRC
Cutting material												HSSE	HSSE
Surface												Vaporised	Vaporised
ToI.												ISO 2 (6H)	ISO 2 (6H)
Lead angle shape												C	B
Application type/machine type												CNC Conventional	CNC Conventional
Twist angle												40° (right)	0°
Coolant supply												External	External
DIN												13318... Ident. No.	13119... Ident. No.
M2	0.4	1.6	45	2.8	2.1	371	020	●	-	-	-	-	
M2.5	0.45	2.05	50	2.8	2.1	371	025	●	-	-	-	-	
M3	0.5	2.5	56	3.5	2.7	371	030	●	030	●	●	●	
M4	0.7	3.3	63	4.5	3.4	371	040	●	040	●	●	●	
M5	0.8	4.2	70	6	4.9	371	050	●	050	●	●	●	
M6	1	5	80	6	4.9	371	060	●	060	●	●	●	
M8	1.25	6.8	90	8	6.2	371	080	●	080	●	●	●	
M10	1.5	8.5	100	10	8	371	100	●	100	●	●	●	
M12	1.75	10.2	110	9	7	376	120	●	-	-	-	-	

Prod. Gr. 1DB

ATORN® ORION® Machine tap, HSSE, vaporised (DIN 376)

for universal use up to 1000 N/mm²



No. 13117-13119



No. 13283-13321

Application:

No. 13117-13119: For producing metric threads on CNC machines or conventional machines in **through holes** in the steel, (stainless steel), non-ferrous metals and (cast iron) material groups up to a strength of 1000 N/mm².

No. 13283-13321: For producing metric threads on CNC machines or conventional machines in **blind holes** in the steel, (stainless steel), non-ferrous metals and (cast iron) material groups up to a strength of 1000 N/mm².

- **No. 13119:** With protruding shank
- **No. 13321:** With transition-fit shank

Advantage:








- **No. 13117 020-13117 360, 13283 030-13283 360:** good service life and process reliability thanks to innovative cutting geometry and universal use for the greatest flexibility in applications
- **No. 13119 106-13119 300, 13321 030-13321 300:** Standard geometry with very good price/performance ratio

Execution:

- **No. 13117 020-13117 360, 13283 030-13283 360:** with over-long shank

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
13117	16	11		9		18	18	15	18	15	15	13		16					
13119105-300	16	11		9		18	18	15	18	15	15	13		16					
13283	17	12		10		19	19	17	19	17	17	15		18					
13321030-300	17	12		10		19	19	17	19	17	17	15		18					

Thread tools \ Machine tap M

							ATORN®		ORION®						
Cutting material							HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE		
Surface							Vaporised	Vaporised	Vaporised	Vaporised	Vaporised	Vaporised	Vaporised		
Tol.							ISO 2 (6H)	ISO 2 (6H)	ISO 2 (6H)	ISO 2 (6H)	ISO 2 (6H)	ISO 2 (6H)	ISO 2 (6H)		
Lead angle shape							B	C	C	C	C	B	B		
Application type/machine type							CNC Conventional	CNC Conventional	CNC Conventional	CNC Conventional	CNC Conventional	CNC Conventional	CNC Conventional		
Twist angle							0°	40° (right)	40° (right)	40° (right)	40° (right)	0°	0°		
Coolant supply							External	External	External	External	External	External	External		
DIN							13117... Ident. No.	13283... Ident. No.	13321... Ident. No.	13119... Ident. No.	13119... Ident. No.	13119... Ident. No.	13119... Ident. No.		
							376	020	●	-	-	-	-	-	-
M2	0.4	1.6	45	1.4	2.1	376	020	●	-	-	-	-	-	-	-
M3	0.5	2.5	56	2.2	2.7	376	030	●	030	●	030	●	-	-	-
M4	0.7	3.3	63	2.8	2.1	376	040	●	040	●	040	●	-	-	-
M5	0.8	4.2	70	3.5	2.7	376	050	●	050	●	050	●	-	-	-
M6	1	5	80	4.5	3.4	376	060	●	060	●	060	●	106	●	●
M8	1.25	6.8	90	6	4.9	376	080	●	080	●	080	●	108	●	●
M10	1.5	8.5	100	7	5.5	376	100	●	100	●	100	●	110	●	●
M12	1.75	10.2	110	9	7	376	120	●	120	●	120	●	120	●	●
M14	2	12	110	11	9	376	140	●	140	●	-	-	-	-	-
M16	2	14	110	12	9	376	160	●	160	●	160	●	160	●	●
M18	2.5	15.5	125	14	11	376	180	●	180	●	-	-	-	-	-
M20	2.5	17.5	140	16	12	376	200	●	200	●	200	●	200	●	●
M22	2.5	19.5	140	18	14.5	376	220	●	-	-	-	-	-	-	-
M24	3	21	160	18	14.5	376	240	●	240	●	240	●	240	●	●
M27	3	24	160	20	16	376	270	●	270	●	-	-	-	-	-
M30	3.5	26.5	180	22	18	376	300	●	300	●	300	●	300	●	●
M36	4	32	200	28	22	376	360	●	360	●	-	-	-	-	-

ORION = Prod. Gr. 1DB
ATORN = Prod. Gr. 1KA



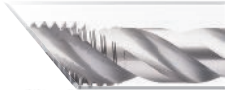
Screw tap P Max 1300 for universal use up to 1300 N/mm²

Application:

Machine tap for universal application up to 1300 N/mm² both on CNC machines and on conventional machines.

Advantages:

- Very long service life in high-strength steel
- Large selection of coatings
- Wide product range in M, MF



ATORN® ORION® Machine tap, HSSE For use in high-strength steel up to 1300 N/mm²



Application:

No. 13130-13149: For producing metric threads on CNC machines or conventional machines in **through holes** in the high-strength steel material group up to a strength of 1300 N/mm².

No. 13306-13319: For producing metric threads on CNC machines or conventional machines in **blind holes** in the high-strength steel material group up to a strength of 1300 N/mm².

Execution:

- **No. 13130:** Dimensions to: DIN 371 = reinforced shank (to M10), DIN 376 = protruding shank (from M12)

- **No. 13149 030-13149 120, 13319 030-13319 120:** Dimensions in accordance with: DIN 371 = reinforced shank (up to M10), DIN 376 = transition-fit shank (from M12)

- **No. 13306:** structural dimensions in accordance with: DIN 371 = reinforced shank (up to M10), DIN 376 = over-long shank (from M12)

Advantage:

- **No. 13130:** Long service life and process reliability through innovative cutting geometry for use in high-strength steel
- **No. 13149 030-13149 120, 13319 030-13319 120:** Standard geometry with an excellent price-performance ratio
- **No. 13306:** good service life and process reliability thanks to innovative cutting geometry and coating for use in high-strength steel



No. 13130-13149



No. 13306



No. 13319

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.			
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	>65 HRC		
13130020-100	16	12	9																		
13130120-240	16	12	9																		
13149030-100	16	12	9																		
13149120	16	12	9																		
13306020-100	16	12	9																		
13306120	16	12	9																		
13319030-100	16	12	9																		
13319120	16	12	9																		

							ATORN®		ORION®		ATORN®		ORION®												
Cutting material							HSSE		HSSE		HSSE		HSSE												
Surface							Vaporised		Vaporised		Vaporised		Uncoated												
Tol.							ISO 2 (6H)		ISO 2 (6H)		ISO 2 (6H)		ISO 2 (6H)												
Lead angle shape							B		B		C		C												
Application type/machine type							CNC Conventional		CNC Conventional		CNC Conventional		CNC Conventional												
Twist angle							0°		0°		40° (right)		40° (right)												
Coolant supply							External		External		External		External												
DIN							13130... Ident. No.		13149... Ident. No.		13306... Ident. No.		13319... Ident. No.												
M2	0.4	1.6	45	2.8	2.1	371	020	●	-	-	020	●	-	-											
M2.5	0.45	2.05	50	2.8	2.1	371	025	●	-	-	025	●	-	-											
M3	0.5	2.5	56	3.5	2.7	371	030	●	030	●	030	●	030	●	030	●	030	●	030	●	030	●	030	●	030
M4	0.7	3.3	63	4.5	3.4	371	040	●	040	●	040	●	040	●	040	●	040	●	040	●	040	●	040	●	040
M5	0.8	4.2	70	6	4.9	371	050	●	050	●	050	●	050	●	050	●	050	●	050	●	050	●	050	●	050
M6	1	5	80	6	4.9	371	060	●	060	●	060	●	060	●	060	●	060	●	060	●	060	●	060	●	060
M8	1.25	6.8	90	8	6.2	371	080	●	080	●	080	●	080	●	080	●	080	●	080	●	080	●	080	●	080
M10	1.5	8.5	100	10	8	371	100	●	100	●	100	●	100	●	100	●	100	●	100	●	100	●	100	●	100
M12	1.75	10.2	110	9	7	376	120	●	120	●	120	●	120	●	120	●	120	●	120	●	120	●	120	●	120
M16	2	14	110	12	9	376	160	●	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	
M20	2.5	17.5	140	16	12	376	200	●	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	
M24	3	21	160	18	14.5	376	240	●	-	-	-	●	-	-	-	-	-	-	-	-	-	-	-	-	

ORION = Prod. Gr. 1DB
ATORN® = Prod. Gr. 1KA

i Machine tap, yellow ring, CNC/conventional
For use on stainless steel

Application:

Machine tap for application in stainless steel both on CNC machines and on conventional machines.

Advantages:

- Very long service life in stainless steel
- Large selection of coatings
- Wide product range in M, MF



ATORN® ORION® HSSE machine taps, vaporised
For use on stainless steels



Application:

No. 13136-13145: For producing metric threads on CNC or conventional machines in **through holes** in the stainless steel material group.

No. 13279-13288: For producing metric threads on CNC machines or conventional machines in **blind holes** in the stainless steel material group.

Execution:

- **No. 13136:** Dimensions to: DIN 371 = reinforced shank (to M10), DIN 376 = protruding shank (from M12)
- **No. 13145:** Dimensions in accordance with: DIN 371 = reinforced shank (up to M10), DIN 376 = transition-fit shank (from M12)
- **No. 13279:** Structural dimensions according to: DIN 371 = reinforced shank (up to M10), DIN 376 = protruding shank (from M12)

- **No. 13288:** structural dimensions in accordance with: DIN 371 = reinforced shank (up to M10), DIN 376 = over-long shank (from M12)

Advantage:

- **No. 13136:** Long service life and process reliability through innovative cutting geometry in machining stainless steel
- **No. 13145 120-13145 240:** Standard geometry with an excellent price-performance ratio
- **No. 13279:** Standard geometry with very good price/performance ratio
- **No. 13288:** long service life and high process reliability thanks to innovative cutting geometry for machining stainless steel



No. 13136-13145

No. 13279

No. 13288

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
13136030-100	16	12		9	10															
13136120-300	16	12		9	10															
13145030-100	16	12		9	10															
13145120-240	16	12		9	10															
13279030-100	16	12		9	10															
13279120	16	12		9	10															
13288020-100	16	12		9	10															
13288120-300	16	12		9	10															

							ATORN®				ORION®										
Cutting material							HSSE		HSSE		HSSE		HSSE								
Surface							Vaporised		Vaporised		Vaporised		Vaporised								
Tol.							ISO 2 (6H)		ISO 2 (6H)		ISO 2 (6H)		ISO 2 (6H)								
Lead angle shape							C		B		B		C								
Application type/machine type							CNC Conventional		CNC Conventional		CNC Conventional		CNC Conventional								
Twist angle							40° (right)		0°		0°		40° (right)								
Coolant supply							External		External		External		External								
DIN							13288... Ident. No.		13136... Ident. No.		13145... Ident. No.		13279... Ident. No.								
M2	0.4	1.6	45	2.8	2.1	371	020	●	-	-	-	-	-	-	-	-	-	-	-	-	-
M2.5	0.45	2.05	50	2.8	2.1	371	025	●	-	-	-	-	-	-	-	-	-	-	-	-	-
M3	0.5	2.5	56	3.5	2.7	371	030	●	030	●	030	●	030	●	030	●	030	●	030	●	030
M4	0.7	3.3	63	4.5	3.4	371	040	●	040	●	040	●	040	●	040	●	040	●	040	●	040
M5	0.8	4.2	70	6	4.9	371	050	●	050	●	050	●	050	●	050	●	050	●	050	●	050
M6	1	5	80	6	4.9	371	060	●	060	●	060	●	060	●	060	●	060	●	060	●	060
M8	1.25	6.8	90	8	6.2	371	080	●	080	●	080	●	080	●	080	●	080	●	080	●	080
M10	1.5	8.5	100	10	8	371	100	●	100	●	100	●	100	●	100	●	100	●	100	●	100
M12	1.75	10.2	110	9	7	376	120	●	120	●	120	●	120	●	120	●	120	●	120	●	120
M14	2	12	110	11	9	376	140	●	140	●	-	-	-	-	-	-	-	-	-	-	-
M16	2	14	110	12	9	376	160	●	160	●	160	●	160	●	160	●	160	●	160	●	160
M18	2.5	15.5	125	14	11	376	180	●	180	●	-	-	-	-	-	-	-	-	-	-	-
M20	2.5	17.5	140	16	12	376	200	●	200	●	200	●	200	●	200	●	200	●	200	●	200
M24	3	21	160	18	14.5	376	240	●	240	●	240	●	240	●	240	●	240	●	240	●	240
M30	3.5	26.5	180	22	18	376	300	●	300	●	-	-	-	-	-	-	-	-	-	-	-

ORION = Prod. Gr. 1DB
ATORN = Prod. Gr. 1KA



ATORN® ORION® HSSE machine tap (DIN 374)

for universal use up to 1000 N/mm²



Application:

No. 13144-13147: For producing fine metric threads on CNC machines or conventional machines in **through holes** in the steel, (stainless steel), non-ferrous metals and (cast iron) material groups up to a strength of 1000 N/mm².

No. 13335: For producing fine metric threads on CNC machines or conventional machines in **blind holes** in the steel, (stainless steel), non-ferrous metals and cast iron material groups up to a strength of 1000 N/mm².

Execution:

- **No. 13144:** With protruding shank
- **No. 13147-13335:** With transition-fit shank

Advantage:

- **No. 13144:** Long service life and process reliability through innovative cutting geometry and universal use for maximum application flexibility
- **No. 13147:** Long service life and high process reliability thanks to innovative cutting geometry, and universal use for maximum flexibility in use.
- **No. 13335:** Standard geometry with an excellent price-performance ratio



No. 13144-13147



No. 13335

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
13144	16	11		9		18	18	15	18	15	15	13	14	16					
13147	16	11		9		18	18	15	18	15	15	13	14	16					
13335	16	11		9		18	18	15	18	15	15	13	14	16					

						ATORN®		ORION®			
Cutting material						HSSE		HSSE		HSSE	
Surface						Uncoated		Uncoated		Uncoated	
Tol.						ISO 2 (6H)		ISO 2 (6H)		ISO 2 (6H)	
Lead angle shape						B		B		C	
Application type/machine type						CNC Conventional		CNC Conventional		CNC Conventional	
Twist angle						0°		0°		40° (right)	
Coolant supply						External		External		External	
DIN						13144... Ident. No.		13147... Ident. No.		13335... Ident. No.	
MF3	0.35	2.65	56	2.2	-	374	030	●	-	-	-
MF4	0.5	3.5	63	2.8	2.1	374	045	●	-	-	-
MF5	0.5	4.5	70	3.5	2.7	374	050	●	-	-	-
MF6	0.5	5.5	80	4.5	3.4	374	060	●	-	-	-
MF6	0.75	5.2	80	4.5	3.4	374	065	●	-	-	-
MF7	0.75	6.2	80	5.5	4.3	374	070	●	-	-	-
MF8	0.5	7.5	80	6	4.9	374	080	●	-	-	-
MF8	0.75	7.2	80	6	4.9	374	083	●	-	-	-
MF8	1	7	90	6	4.9	374	086	●	086	●	086
MF9	1	8	90	7	5.5	374	090	●	-	-	-
MF10	0.75	9.2	90	7	5.5	374	100	●	-	-	-
MF10	1	9	90	7	5.5	374	103	●	103	●	103
MF10	1.25	8.8	100	7	5.5	374	106	●	106	●	-
MF11	1	10	90	8	6.2	374	110	●	110	●	-
MF12	1	11	100	9	7	374	120	●	120	●	120
MF12	1.25	10.8	100	9	7	374	123	●	123	●	123
MF12	1.5	10.5	100	9	7	374	126	●	126	●	126
MF14	1	13	100	11	9	374	140	●	140	●	-
MF14	1.25	12.8	100	11	9	374	143	●	-	-	-
MF14	1.5	12.5	100	11	9	374	146	●	146	●	146
MF15	1	14	100	12	9	374	150	●	150	●	-
MF15	1.5	13.5	100	12	9	374	154	●	154	●	-

MF16	1	15	100	12	9	374	160	●	160	●	-
MF16	1.5	14.5	100	12	9	374	165	●	165	●	165
MF18	1	17	110	14	11	374	180	●	-	-	-
MF18	1.5	16.5	110	14	11	374	183	●	183	●	183
MF18	2	16	125	14	11	374	185	●	185	●	-
MF20	1	19	125	16	12	374	200	●	200	●	-
MF20	1.5	18.5	125	16	12	374	203	●	203	●	203
MF20	2	18	140	16	12	374	206	●	-	-	-
MF22	1	21	125	18	14.5	374	220	●	-	-	-
MF22	1.5	20.5	125	18	14.5	374	223	●	-	-	-
MF22	2	20	140	18	14.5	374	226	●	-	-	-
MF24	1	23	140	18	14.5	374	240	●	-	-	-
MF24	1.5	22.5	140	18	14.5	374	243	●	-	-	-
MF24	2	22	140	18	14.5	374	246	●	-	-	-
MF26	1.5	24.5	140	18	14.5	374	260	●	-	-	-
MF27	1.5	25.5	140	20	16	374	270	●	-	-	-
MF27	2	25	140	20	16	374	273	●	-	-	-
MF30	1.5	28.5	150	22	18	374	303	●	-	-	-
MF30	2	28	150	22	18	374	306	●	-	-	-
MF32	1.5	30.5	150	22	18	374	320	●	-	-	-
MF33	1.5	31.5	160	25	20	374	330	●	-	-	-
MF35	1.5	33.5	170	28	22	374	350	●	-	-	-
MF36	1.5	34.5	170	28	22	374	360	●	-	-	-
MF38	1.5	36.5	170	28	22	374	380	●	-	-	-
MF40	1.5	38.5	170	32	24	374	405	●	-	-	-

ATORN® ORION® HSSE machine tap (DIN 5156)
for universal use up to 1000 N/mm²



No. 13207-13209



No. 13378-13379

Application:

No. 13207-13209: For manufacturing pipe threads on CNC or conventional machines in **through holes** in the steel, (stainless steel), NF metal and (cast iron) material groups up to a strength of 1000 N/mm².

No. 13378-13379: For producing pipe threads on CNC machines or conventional machines in **blind holes** in the steel, (stainless steel), non-ferrous metals and (cast iron) material groups up to a strength of 1000 N/mm².

Advantage:

- **No. 13207:** Long service life and high process reliability thanks to innovative cutting geometry, and universal use for maximum flexibility in use.
- **No. 13209:** Standard geometry with an excellent price-performance ratio
- **No. 13378-13379:** Long service life and high level of process reliability thanks to innovative cutter geometry and universal application for maximum flexibility in use

Execution:

- With transition-fit shank

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
13207	16	12		9		18	18	15	18	15	15	13		16					
13209	16	12		9		18	18	15	18	15	15	13		16					
13379	16	12		9		18	18	15	18	15	15	13		16					

							ATORN®				ORION®								
Cutting material							HSSE	HSSE	HSSE	HSSE									
Surface							Vaporised	Vaporised	Vaporised	Vaporised									
Tol.							ISO 2 (6H)	ISO 2 (6H)	ISO 2 (6H)	ISO 2 (6H)									
Lead angle shape							B	C	C	B									
Application type/machine type							CNC Conventional	CNC Conventional	CNC Conventional	CNC Conventional									
Twist angle							0°	40° (right)	40° (right)	0°									
Coolant supply							External	External	External	External									
DIN							13207... Ident. No.	13378... Ident. No.	13379... Ident. No.	13209... Ident. No.									
G 1/8 in	28	8.8	90	7	5.5	5156	010	●	010	●	010	●	010	●	010	●	010	●	010
G 1/4 in	19	11.8	100	11	9	5156	020	●	020	●	020	●	020	●	020	●	020	●	020
G 3/8 in	19	15.25	100	12	9	5156	030	●	030	●	030	●	030	●	030	●	030	●	030
G 1/2 in	14	19	125	16	12	5156	040	●	040	●	040	●	040	●	040	●	040	●	040
G 5/8 in	14	21	125	18	14.5	5156	-	-	050	●	050	●	-	-	-	-	-	-	-
G 3/4 in	14	24.5	140	20	16	5156	060	●	060	●	060	●	060	●	060	●	060	●	060
G 7/8 in	14	28.25	150	22	18	5156	-	-	070	●	-	●	-	-	-	-	-	-	-
G 1 in	11	30.75	160	25	20	5156	080	●	080	●	080	●	080	●	080	●	080	●	080
G 1-1/4 in	11	39.25	170	32	24	5156	100	●	-	-	-	-	-	-	-	-	-	-	100

ORION = Prod. Gr. 1DB
ATORN® = Prod. Gr. 1KC

ORION® Trapezoidal machine tap with pilot pin (DIN 103)
for universal use up to 1000 N/mm²



Application:

For producing trapezoidal threads on conventional machines in **through holes** in the steel (stainless steel), non-ferrous metals and (cast iron) material groups up to a strength of 1000 N/mm².

Execution:

- with over-long shank, taper tap and segmented casing cut, tolerance range H7

Advantage:

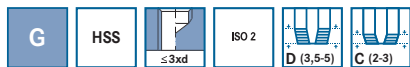
- optimised geometry for conventional use

							Cutting material	
							HSSE	
							Surface	
							Uncoated	
							Application type/machine type	
							Conventional	
							Twist angle	
							0°	
							Coolant supply	
							External	
							DIN	
							13229... Ident. No.	
TR12	3	9.25	160	8	6.2	103	123	●
TR16	4	12.25	200	11	9	103	163	●
TR20	4	16.25	200	15	12	103	203	●
TR24	5	19.25	240	18	14.5	103	243	●

Prod. Gr. 1KC

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
13229	16	12		9		18	18	15	18	15	15			16					

ATORN® ORION® HSS hand tap (DIN 5157)
for universal use up to 1000 N/mm²



Application:

No. 13045 010-13046 140: For producing pipe threads by hand in through holes and blind holes, in steel, non-ferrous metals and (cast iron) material groups up to a strength of 1000 N/mm² in single-part production.

No. 13046 710-13046 880: For manually tapping pipe threads in through holes and blind holes in the steel, NF metal and (cast) material groups up to a strength of 1000 N/mm² in single part production.

Execution:

- **No. 13045 010-13046 140:** Set containing taper tap (form D) and third tap (plug) (form C)

- **No. 13046 710-13046 780:** Taper tap with notch shape A with one ring
- **No. 13046 820-13046 880:** Third tap notch shape C without ring

Advantage:

- **No. 13045:** Long service life and process reliability through innovative cutting geometry and universal use for maximum application flexibility
- **No. 13046 010-13046 140:** Standard geometry with very good price/performance ratio
- **No. 13046 710-13046 880:** Standard geometry with a very good price-performance ratio



No. 13045 010-13046 140, 13046 820-13046 880
Third tap, shape C



No. 13045 010-13046 780
Taper tap, shape D

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
13045	●	●		○		●	●	●	●	●	●	●	○	○					
13046010-140	●	●		○		●	●	●	●	●	●	●	○	○					
13046710-780	●	●		○		●	●	●	●	●	●	●	○	○					
13046810-880	●	●		○		●	●	●	●	●	●	●	○	○					

						ATORN®		ORION®					
						Set D/C		Set D/C		Taper tap D		Third tap C	
						Version Lead angle shape		Version Lead angle shape		Version Lead angle shape		Version Lead angle shape	
						13045... Ident. No.		13046... Ident. No.		13046... Ident. No.		13046... Ident. No.	
G 1/8 in	28	8.8	63	7	5.5	010	●	010	●	710	●	-	-
G 1/4 in	19	11.8	70	11	9	020	●	020	●	720	●	820	●
G 3/8 in	19	15.25	70	12	9	030	●	030	●	730	●	830	●
G 1/2 in	14	19	80	16	12	040	●	040	●	740	●	840	●
G 5/8 in	14	21	80	18	14.5	-	-	050	●	750	●	850	●
G 3/4 in	14	24.5	90	20	16	060	●	060	●	760	●	860	●
G 7/8 in	14	28.25	90	22	18	-	-	070	●	-	-	-	-
G 1 in	11	30.75	100	22	20	-	-	080	●	780	●	880	●
G 1-1/4 in	11	39.25	125	32	24	-	-	100	●	-	-	-	-
G 1-1/2 in	11	45.25	140	36	29	-	-	120	●	-	-	-	-
G 2 in	11	57	160	45	35	-	-	140	●	-	-	-	-

ORION = Prod. Gr. 1DA
ATORN = Prod. Gr. 1KM

ORION® HSS hand tap (DIN 352)
for universal use up to 1000 N/mm²



Application:

Ident. No. 010-300: For manually tapping metric threads in through holes and blind holes in the steel, NF metal and (cast) material groups up to a strength of 1000 N/mm² in single part production.

Ident. No. 720-968: For producing metric threads by hand in through holes and blind holes, in steel, non-ferrous metals and (cast iron) material groups up to a strength of 1000 N/mm² in single-part production.

Execution:

- **Ident. No. 010-300:** Set consisting of taper tap (form A), second tap (form D) and third tap (form C)

- **Ident. No. 720-768:** Taper tap with notch shape A with one ring
- **Ident. No. 820-868:** Second tap with notch shape D with two rings
- **Ident. No. 920-968:** Third tap (plug) with notch shape C without ring

Advantage:

- **Ident. No. 010-300:** Standard geometry with a very good price-performance ratio
- **Ident. No. 720-968:** Standard geometry with very good price/performance ratio



Ident. No. 010-768
Taper tap, shape A

Ident. No. 010-300, 820-868
Second tap, shape D

Ident. No. 010-300, 920-968
Third tap, shape C

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
13013010-300	●	●		○		○	●	●	●	●	●	●	○	○						
13013720-768	●	●		○		○	●	●	●	●	●	●	○	○						
13013820-868	●	●		○		○	●	●	●	●	●	●	○	○						
13013920-968	●	●		○		○	●	●	●	●	●	●	○	○						

	Version Lead angle shape	Set A/D/C		Taper tap A		Second tap D		Third tap C					
		13013... Ident. No.	13013... Ident. No.	13013... Ident. No.	13013... Ident. No.	13013... Ident. No.	13013... Ident. No.						
M1	0.25	0.75	32	2.5	2.1	010	●	-	-	-	-	-	-
M2	0.4	1.6	36	2.8	2.1	020	●	720	●	820	●	920	●
M2.2	0.45	1.75	36	2.8	2.1	022	●	-	-	-	-	-	-
M2.5	0.45	2.05	36	2.8	2.1	025	●	725	●	825	●	925	●
M3	0.5	2.5	40	3.5	2.7	030	●	730	●	830	●	930	●
M3.5	0.6	2.9	45	4	3	035	●	-	-	-	-	-	-
M4	0.7	3.3	45	4.5	3.4	040	●	734	●	834	●	934	●
M5	0.8	4.2	50	6	4.9	050	●	738	●	838	●	938	●
M6	1	5	50	6	4.9	060	●	740	●	840	●	940	●
M7	1	6	50	6	4.9	070	●	-	-	-	-	-	-
M8	1.25	6.8	56	6	4.9	080	●	744	●	844	●	944	●
M10	1.5	8.5	70	7	5.5	100	●	748	●	848	●	948	●
M12	1.75	10.2	75	9	7	120	●	752	●	852	●	952	●
M14	2	12	80	11	9	140	●	754	●	854	●	954	●
M16	2	14	80	12	9	160	●	756	●	856	●	956	●
M18	2.5	15.5	95	14	11	180	●	758	●	858	●	958	●
M20	2.5	17.5	95	16	12	200	●	760	●	860	●	960	●
M22	2.5	19.5	100	18	14.5	220	●	-	-	-	-	-	-
M24	3	21	110	18	14.5	240	●	764	●	864	●	964	●
M27	3	24	110	20	16	270	●	-	-	-	-	-	-
M30	3.5	26.5	125	22	18	300	●	768	●	868	●	968	●

Prod. Gr. 1DA

ORION® ATORN® HSS hand tap (DIN 2181)

for universal use up to 1000 N/mm²



Application:
No. 13020 045–13020 360, 13023 803–13023 886: For manually tapping fine metric threads in through holes and blind holes in the steel, NF metal and (cast) material groups up to a strength of 1000 N/mm² in single part production.
No. 13023 030–13023 786: For producing metric fine threads by hand in through holes and blind holes, in steel, non-ferrous metals and (cast iron) material groups up to a strength of 1000 N/mm² in single-part production.

Execution:
 ▪ **No. 13020:** Set consisting of taper tap (form A) and third tap (form C)

- **No. 13023 030–13023 280:** Set containing taper tap (form A) and third tap (plug) (form C)
- **No. 13023 703–13023 786:** Taper tap with notch shape A with one ring
- **No. 13023 803–13023 886:** Third tap notch shape C without ring

- Advantage:**
- **No. 13020:** Long service life and high level of process reliability thanks to innovative cutting geometry and universal application for maximum flexibility in use
 - **No. 13023 030–13023 786:** Standard geometry with very good price/performance ratio
 - **No. 13023 803–13023 886:** Standard geometry with a very good price-performance ratio



No. 13020 045–13023 786
Taper tap, shape D



No. 13020 045–13023 280, 13023 803–13023 886
Third tap, shape C

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G)GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
13020	●	●		○		●	●	●	●	●	●	●	○	○					
13023030-280	●	●		○		●	●	●	●	●	●	●	○	○					
13023703-786	●	●		○		●	●	●	●	●	●	●	○	○					
13023803-886	●	●		○		●	●	●	●	●	●	●	○	○					

Version	Lead angle	shape	ORION®		ATORN®		ORION®		ATORN®		ORION®		ATORN®	
			Set D/C	Ident. No.	Set D/C	Ident. No.	Taper tap D	Ident. No.	Third tap C	Ident. No.				
MF3	0.35	2.65	40	3.5	2.7	030	●	-	-	-	-	-	-	-
MF4	0.5	3.5	45	4.5	3.4	045	●	045	●	-	-	-	-	-
MF5	0.5	4.5	50	6	4.9	050	●	050	●	-	-	-	-	-
MF6	0.5	5.5	50	6	4.9	-	-	060	●	-	-	-	-	-
MF6	0.75	5.2	50	6	4.9	065	●	065	●	-	-	-	-	-
MF7	0.75	6.2	50	6	4.9	-	-	070	●	-	-	-	-	-
MF8	0.5	7.5	50	6	4.9	-	-	080	●	-	-	-	-	-
MF8	0.75	7.2	50	6	4.9	083	●	083	●	-	-	-	-	-
MF8	1	7	56	6	4.9	086	●	086	●	786	●	886	●	●
MF10	1	9	63	7	5.5	103	●	103	●	703	●	803	●	●
MF10	1.25	8.8	70	7	5.5	106	●	106	●	-	-	-	-	-
MF10	0.75	9.2	68	7	5.5	-	-	100	●	-	-	-	-	-
MF12	1	11	70	9	7	120	●	120	●	720	●	820	●	●
MF12	1.25	10.8	70	9	7	123	●	123	●	-	-	-	-	-
MF12	1.5	10.5	70	9	7	126	●	126	●	726	●	826	●	●
MF14	1	13	70	11	9	140	●	140	●	-	-	-	-	-
MF14	1.25	12.8	70	11	9	143	●	143	●	-	-	-	-	-
MF14	1.5	12.5	70	11	9	146	●	146	●	742	●	842	●	●
MF15	1	14	70	12	9	-	-	150	●	-	-	-	-	-
MF16	1	15	70	12	9	160	●	160	●	-	-	-	-	-
MF16	1.5	14.5	70	12	9	165	●	165	●	765	●	865	●	●
MF18	1	17	80	14	11	180	●	180	●	780	●	880	●	●
MF18	1.5	16.5	80	14	11	183	●	183	●	783	●	883	●	●
MF20	1	19	80	16	12	200	●	200	●	-	-	-	-	-
MF20	1.5	18.5	80	16	12	203	●	203	●	713	●	813	●	●
MF20	2	18	80	16	12	206	●	-	-	-	-	-	-	-
MF22	1.5	20.5	80	18	14.5	223	●	223	●	-	-	-	-	-
MF22	1	21	80	18	14.5	220	●	-	-	-	-	-	-	-
MF24	1	23	90	18	14.5	-	-	240	●	-	-	-	-	-
MF24	1.5	22.5	90	18	14.5	243	●	243	●	-	-	-	-	-
MF24	2	22	90	18	14.5	-	-	246	●	-	-	-	-	-
MF26	1.5	24.5	90	18	14.5	260	●	-	-	-	-	-	-	-
MF27	2	25	90	20	16	-	-	275	●	-	-	-	-	-
MF28	1.5	26.5	90	20	16	280	●	-	-	-	-	-	-	-
MF30	1.5	28.5	90	22	18	-	-	303	●	-	-	-	-	-
MF30	2	28	90	22	18	-	-	306	●	-	-	-	-	-
MF36	1.5	34.5	100	28	22	-	-	360	●	-	-	-	-	-

ORION = Prod. Gr. 1DA
 ATORN = Prod. Gr. 1KM

Female thread creation: Thread forming (thread tapping)

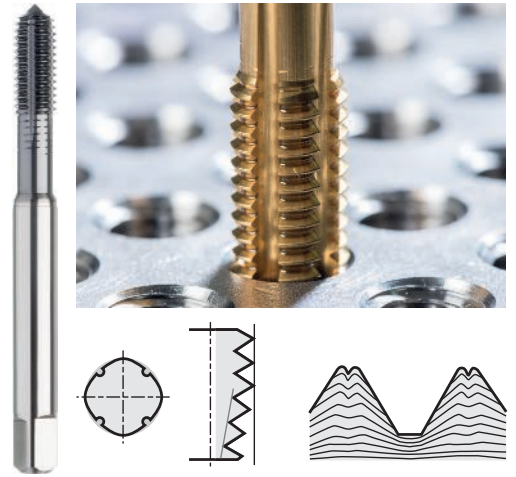
In contrast to tapping, where sections are cut out of the material, the process of thread forming does not involve cutting. The material is made to flow through the polygon shape of the thread former. The fibre pattern is not interrupted.

Advantages:

- Very high working speed and process reliability
- Very high surface quality
- One tool for through hole and blind hole
- No clamping problems
- Higher thread strength
- Tools are easier to use
- Long service life, less breakage
- Deep threads

Disadvantages:

- Higher torque
- Special pre-drilling diameter with tight tolerance
- Incomplete moulding of cores (claw)
- Minimum expansion of tool must be ensured
- Regrinding not possible
- Lubrication essential
- Where used in the food or medicine industries, there is a risk of germ build-up in the area of the moulding recess.



Thread forming – the process

Process:

In contrast to tapping, where sections are cut out of the material, thread forming is a non-cutting, pressure forming procedure.

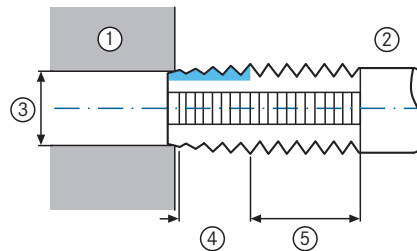
Advantages:

- No chip formation
- Up to 30% higher surface quality than with thread cutting
- Up to 40% higher processing speed than with thread cutting
- Threads in through holes and blind holes can be produced with the same tool
- Wide range of materials processable
- Cutting of thread eliminated
- Thread pitch and thread angle errors as with cut threads eliminated
- Shaped threads have higher strength owing to non-continuous cut

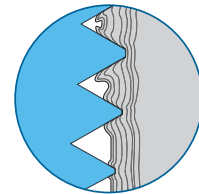
Requirements: For all shapeable materials with elongation >10 %.



unlike with screw tapping, in thread forming the thread is produced by deforming the material. the screw-shaped, polygonal, threaded part of the tool is "screwed in" to the pre-drilled workpiece. It is fed in evenly to match the target thread pitch. the thread profile penetrates the workpiece gradually via the initial cut, causing it to flow and deform plastically.



① workpiece ② tool ③ pre-drill diameter
④ run-in ⑤ guide part



➔ For more detailed information and explanations, refer to the technical manual.



Lubrication grooves on thread formers

Process:

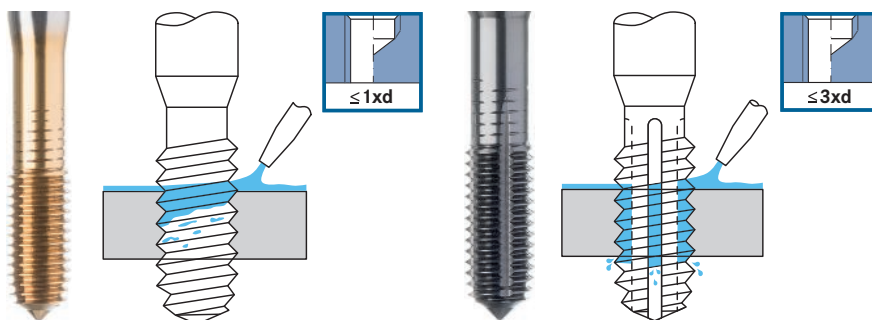
In contrast to tapping, where sections are cut out of the material, thread forming is a non-cutting, pressure forming procedure.

Advantages:

- No chip formation
- Up to 30% higher surface quality than with thread cutting
- Up to 40% higher processing speed than with thread cutting
- Threads in through holes and blind holes can be produced with the same tool
- Wide range of materials processable
- Cutting of thread eliminated
- Thread pitch and thread angle errors as with cut threads eliminated
- Shaped threads have higher strength owing to non-continuous cut

Requirements: For all shapeable materials with elongation >10 %.

We distinguish between two different tool types when it comes to thread formers. There are thread formers with and without lubrication grooves. Lubrication grooves ensure uniform lubrication even in the lower section of deeper threads. Lubrication grooves are also necessary in horizontal machining. Thread formers with lubrication grooves can be used universally. Thread formers without lubrication grooves can produce thread depths of up to 1.5xD with an optimum service life.



Thread formers without lubrication grooves

Thread formers with lubrication grooves

➔ For more detailed information and explanations, refer to the technical manual.



Core hole drilling when thread forming

Process:

In contrast to tapping, where sections are cut out of the material, thread forming is a non-cutting, pressure forming procedure.

Advantages:

- No chip formation
- Up to 30% higher surface quality than with thread cutting
- Up to 40% higher processing speed than with thread cutting
- Threads in through holes and blind holes can be produced with the same tool
- Wide range of materials processable
- Cutting of thread eliminated
- Thread pitch and thread angle errors as with cut threads eliminated
- Shaped threads have higher strength owing to non-continuous cut

Requirements: For all shapeable materials with elongation >10 %.

It is also necessary to drill core holes when thread forming, in order to create a shaped thread. The core hole must have a defined diameter within a certain tolerance range. Countersinking is also essential. When thread forming, however, the core hole is significantly more accurate than when tapping.

Example:

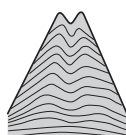
Thread M10 x 1.5 is 9,30 mm.
Tolerance = max. hole 9.38 mm - min. hole = 9.26 mm = 0.12 mm.
When tapping, the tolerance for the same thread is 0.3 mm.

It is important that the drilling is conducted with very accurate drills. The best results are achieved with solid carbide tools. The following graphics illustrate the relationship between the various core hole diameters and their impact on the formed thread.



Pre-drill diameter too large:

- Thread not fully formed
- Moulding recess too big
- Profile height too low



Optimal pre-drill diameter:

- Thread fully formed
- Small moulding recess
- Ideal profile height

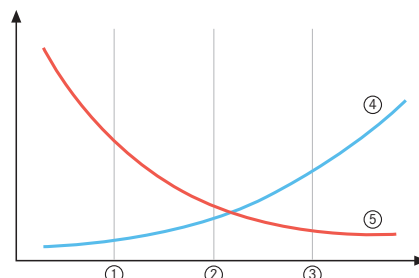


Pre-drill diameter too small:

- Thread over-formed
- No moulding recess
- Profile height too high

By optimising the pre-drill diameter, a significantly higher service life can be achieved, not only in series production generally, but also with materials which are difficult to machine such as stainless steel. This graphic illustrates the relationship:

- ① Minimum dimension
- ② Nominal dimension
- ③ Maximum dimension
- ④ Service life
- ⑤ Torque



➔ For more detailed information and explanations, refer to the technical manual.



ARE YOU LOOKING FOR
EVEN MORE BRANDS?

WE HAVE WHAT IT TAKES.

For a complete range of products that meet the toughest demands, visit www.iconridge.com



Lubrication and cooling during thread forming

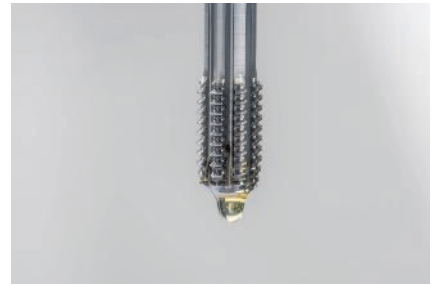
Process:

In contrast to tapping, where sections are cut out of the material, thread forming is a non-cutting, pressure forming procedure.

Advantages:

- No chip formation
- Up to 30% higher surface quality than with thread cutting
- Up to 40% higher processing speed than with thread cutting
- Threads in through holes and blind holes can be produced with the same tool
- Wide range of materials processable
- Cutting of thread eliminated
- Thread pitch and thread angle errors as with cut threads eliminated
- Shaped threads have higher strength owing to non-continuous cut

Requirements: For all shapeable materials with elongation >10 %.



in thread forming, the main job of the coolant is lubrication. the more lubrication is used with the highest possible grease content, the longer the service life. we distinguish between the following coolants:

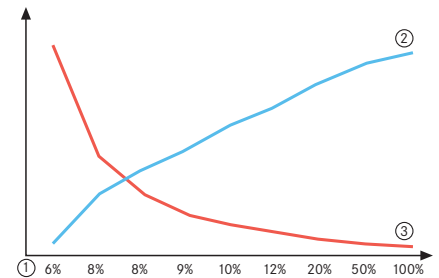
non water-soluble coolants

these are mineral oils with the best lubricating properties. they minimise friction and thus increase the service life.

water-soluble coolants

can be emulsified with water. the grease content of these coolants should be no lower than 6%. the ideal grease content is over 12%.

① coolant grease content ② service life ③ friction



➔ For more detailed information and explanations, refer to the technical manual.



Cutting materials in thread forming

Process:

In contrast to tapping, where sections are cut out of the material, thread forming is a non-cutting, pressure forming procedure.

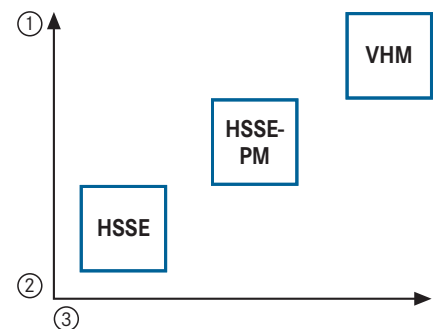
Advantages:

- No chip formation
- Up to 30% higher surface quality than with thread cutting
- Up to 40% higher processing speed than with thread cutting
- Threads in through holes and blind holes can be produced with the same tool
- Wide range of materials processable
- Cutting of thread eliminated
- Thread pitch and thread angle errors as with cut threads eliminated
- Shaped threads have higher strength owing to non-continuous cut

Requirements: For all shapeable materials with elongation >10 %.

Selecting the correct cutting material in thread forming depends strongly on the machine conditions and the quantity to be manufactured. The cutting materials HSSE and HSSE-PM are used in the small to medium quantity range or with unstable machine conditions. In large-scale series production, it is more economical to use solid carbide thread formers.

① Stable ② Unstable ③ Service life/procurement costs



➔ For more detailed information and explanations, refer to the technical manual.



Coatings and surface treatments for thread forming

Process:

In contrast to tapping, where sections are cut out of the material, thread forming is a non-cutting, pressure forming procedure.

Advantages:

- No chip formation
- Up to 30% higher surface quality than with thread cutting
- Up to 40% higher processing speed than with thread cutting
- Threads in through holes and blind holes can be produced with the same tool
- Wide range of materials processable
- Cutting of thread eliminated
- Thread pitch and thread angle errors as with cut threads eliminated
- Shaped threads have higher strength owing to non-continuous cut

Requirements: For all shapeable materials with elongation >10 %.

Titanium nitride

This universal coating is suitable for softer steels and non-ferrous metals. It is only of limited suitability for high-strength steel and stainless steels.

- Vickers hardness: 2200–2300 HV
- Friction coefficient: 0.5
- Temperature resistance: 500–600°C
- Colour: Gold

TiN



Titanium carbon nitride

Its high level of hardness makes titanium carbon nitride coating very well suited to all steels as well as stainless steels, titanium and cast materials above GGG50.

- Vickers hardness: 3000 HV
- Friction coefficient of steel: 0.2
- Temperature resistance: 400°C
- Colour: Blue grey
- (anthracite) lubrication: Oil/emulsion

TiCN



Titanium aluminium nitride

The titanium aluminium nitride coating is suitable for steels and for alloyed heat-treated steels, tool steels, high-speed steels, stainless steels, titanium, hardened steels and nickel-based materials.

- Vickers hardness: 3200 HV
- Friction coefficient of steel: 0.2
- Temperature resistance: <800°C
- Colour: Blue-grey (anthracite)
- Lubrication: Oil/emulsion

TiAlN



Aluminium chrome nitride

The aluminium chrome nitride coating achieves a very long service life due to its wear resistance, oxidation resistance and high-temperature hardness. This coating is only suitable for steel materials in combination with oil as a coolant.

- Vickers hardness: 3200 HV
- Friction coefficient of steel: 0.35
- Temperature resistance: <1100°C
- Colour: Grey blue
- Lubrication: Oil

AlCrN



CARBO

The CARBO coating is an extremely hard layer and was developed for all non-ferrous metals such as copper, brass and aluminium. Built-up edges are significantly reduced by the high level of hardness and low friction coefficient.

- Vickers hardness: 6000 HV
- Friction coefficient: 0.1
- Temperature resistance: 700°C
- Colour: Black
- Lubrication: Oil/emulsion







CARBO



➔ For more detailed information and explanations, refer to the technical manual.



Clamping device recommendation for thread forming

	Length compensa- tion chuck	Synchronous tapping chuck	Collet chucks	Shrink-fit chucks	Hydro-expansion chucks	Surface chuck
						
Length compensation range	9-15 mm	0.5-1 mm	0	0	0	0
Suitable for usage conditions	Unstable	Unstable-stable (synchronous)	Stable (synchronous)	Stable (synchronous)	Stable (synchronous)	Stable
Suitable for conventional machines	●	○	○			
Suitable for CNC machines	○	●	●	●	●	●
Suitable for HSSE/HSSE PM thread formers	●	●	●	●	●	●
Suitable for solid carbide thread formers		●	○	○	○	○

● = very well suited

● = suitable

○ = limited suitability



thread formers without lubrication grooves
for thread depths of up to 1-1.5xD



	Ø	Cutting material	Surface	Tolerance of screw taps	Coolant supply	P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	
13394009-100	M1-M20	HSSE	TiN	ISO 2 (6H)	External	●	●	●	●	○	
13394620-700	M2-M12	HSSE	TiN	ISO 3 (6G)	External	●	●	●	●	○	
13398021-100	M2-M10	HSSE-PM	Carbo coating	ISO 2X (6HX)	External					○	
13398130-180	M3-M8	HSSE-PM	Carbo coating	ISO 3X (6GX)	External					○	



thread formers with lubrication grooves
for thread depths of up to 3xD



	Ø	Cutting material	Surface	Tolerance of screw taps	Coolant supply	P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	
13394130-200	M3-M16	HSSE	TiN	ISO 2X (6HX)	External	●	●	●	●	○	
13394530-600	M3-M16	HSSE	AlCrN	ISO 2X (6HX)	External	●	●	●	●	○	
13393730-800	M3-M20	HSSE	Carbo coating	ISO 2X (6HX)	External					○	
13394330-400	M3-M16	HSSE	TiN	ISO 3X (6GX)	External	●	●	●	●	○	
13396100-134	MF6-MF24	HSSE	TiN	ISO 2 (6H)	External	●	●	●	●	○	
13396200-210	G 1/16- G 3/4 inch	HSSE	TiN		External	●	●	●	●	○	



thread formers with lubrication grooves with internal cooling
for thread depths of up to 3xD



	Ø	Cutting material	Surface	Tolerance of screw taps	Coolant supply	P 700 N/mm ²	P 1000 N/mm ²	P 1300 N/mm ²	M	N	
13393350-400	M5-M20	HSSE-PM	TiCN	ISO 2 (6H)	Internal radial	●	●	●	●	○	
13398650-700	M5-M20	HSSE-PM	TiAlN	ISO 2X (6HX)	Internal radial	●	●	●	●	○	
13393530-600	M3-M16	VHM	TiAlN	ISO 2 (6H)	Internal	●	●	●	●	○	
13399100-145	MF8-MF24	HSSE-PM	TiCN	ISO 2X (6HX)	Internal radial	●	●	●	●	○	
13399530-600	M3-M20	HSSE-PM	TiN	ISO 2X (6HX)	Internal axial	●	●	●	●	○	



Female thread creation: Milling cutter

The development of computer-controlled machines has made the thread milling procedure another option for creating female threads. The thread is produced by the helical diagonal immersion of a rotating tool. In the process, the axial movement of the tool in one revolution produces the pitch. For this procedure, a CNC machine with at least three axes is required (XYZ).

Advantages, tool cost minimisation:

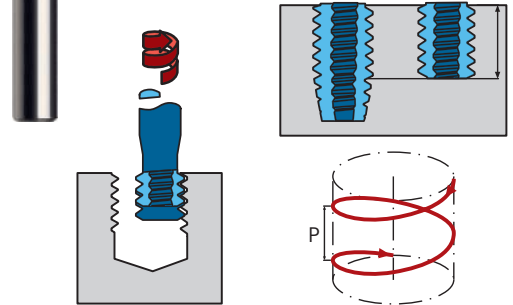
- right-hand and left-hand thread can be manufactured with a tool
- thread milling cutters cover different threads with the same pitch
- for partial thread profiles, a wide range of threads can be produced with a cutting insert

Disadvantages:

- machine requirements (XYZ axes)
- machining times generally longer in series production
- limited experience of the user in thread milling

Advantages, process reliability:

- Extremely high process reliability with very expensive components
- Reliable process solution for problem materials with poor chip breaking and difficult chip formation
- First choice with thin-walled workpieces or unstable clamping operations
- High thread quality
- Thread can be made right to the base of a blind hole
- Radius compensation programming enables thread tolerance to be adjusted easily





Thread milling – the process

Process:

In contrast to tapping, where sections are cut out of the material, thread forming is a non-cutting, pressure forming procedure.

Advantages:

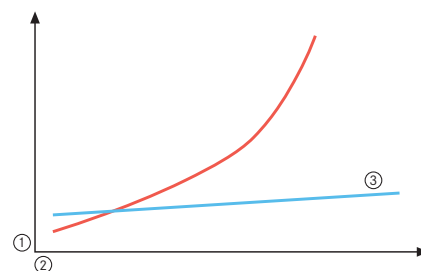
- No chip formation
- Up to 30% higher surface quality than with thread cutting
- Up to 40% higher processing speed than with thread cutting
- Threads in through holes and blind holes can be produced with the same tool
- Wide range of materials processable
- Cutting of thread eliminated
- Thread pitch and thread angle errors as with cut threads eliminated
- Shaped threads have higher strength owing to non-continuous cut

Requirements: For all shapeable materials with elongation >10 %.

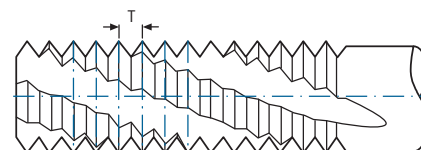
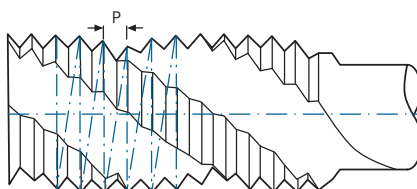


Thread milling is a universal process for the production of male and female threads. It is equally suitable for soft to high-strength materials. Unlike screw tapping and thread forming, in thread milling the forces increase only slightly when the diameter is increased. This makes the process the number one choice when manufacturing large threads on less powerful machines. The diagram illustrates the relationship.

① Torque ② Thread size ③ Thread milling



the successive tool teeth of the thread milling cutter do not form a spiral, instead they are arranged without pitch. The thread pitch must be produced by a CNC machine with the Z axis. Thread milling produces very small chips, so the working process is extremely reliable. This is a crucial advantage; particularly with very expensive components.



➔ For more detailed information and explanations, refer to the technical manual.



Cutting materials in thread milling

Process:

In contrast to tapping, where sections are cut out of the material, thread forming is a non-cutting, pressure forming procedure.

Advantages:

- No chip formation
- Up to 30% higher surface quality than with thread cutting
- Up to 40% higher processing speed than with thread cutting
- Threads in through holes and blind holes can be produced with the same tool
- Wide range of materials processable
- Cutting of thread eliminated
- Thread pitch and thread angle errors as with cut threads eliminated
- Shaped threads have higher strength owing to non-continuous cut

Requirements: For all shapeable materials with elongation >10 %.

VHM

Thread milling only uses the extremely universal solid carbide cutting material, which can be used to machine all material groups. In comparison to screw tapping, thread milling only involves minimal torsional forces, so bending strength is not decisive. In thread milling, low bending strength can even help to prevent the thread milling cutter being deflected.

➔ For more detailed information and explanations, refer to the technical manual.



Selecting the thread milling cutter diameter

Process:

In contrast to tapping, where sections are cut out of the material, thread forming is a non-cutting, pressure forming procedure.

Advantages:

- No chip formation
- Up to 30% higher surface quality than with thread cutting
- Up to 40% higher processing speed than with thread cutting
- Threads in through holes and blind holes can be produced with the same tool
- Wide range of materials processable
- Cutting of thread eliminated
- Thread pitch and thread angle errors as with cut threads eliminated
- Shaped threads have higher strength owing to non-continuous cut

Requirements: For all shapeable materials with elongation >10 %.

Each thread milling cutter generates a certain shape error, especially near the base. The relationship between thread diameter, milling cutter diameter and pitch is the decisive factor. **To minimise the shape error, the thread cutter diameter should not be larger than 70% ± 15% of the thread diameter.**

The correct thread cutter diameter can be determined using the diagram on the next page. An example can be used to illustrate the situation:

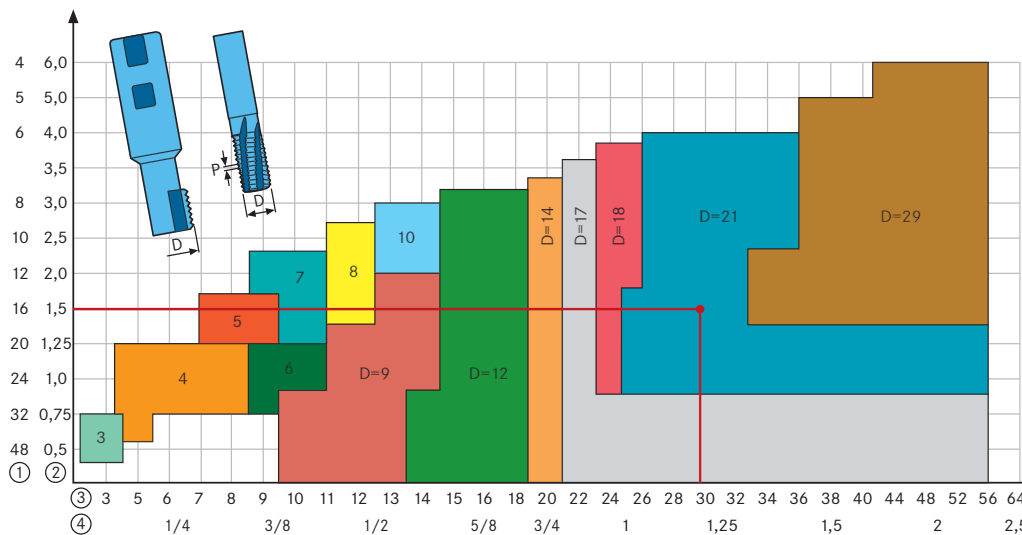
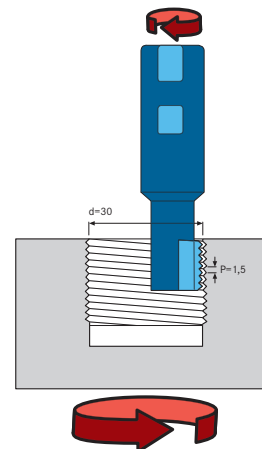
A female thread of M30 x 1.5 is to be produced.

If we now include the pitch and thread diameter to be created in the diagram, the points cross. At the intersection is where we find the recommended thread cutter diameter. In our case, the optimum cutter diameter is 21 mm.

The cutter diameter of 21 mm can be found with the combination of no. 13397 035 (support) + no. 13397 226 (cutting insert). This product can be found in our main catalogue.

The diameter can be calculated in a different way using the following rule of thumb.

When producing an M30 thread, the optimum milling cutter diameter would be 70% of the thread being made. (In this case it would be exactly 21 mm)



P = pitch D = cutting tool diameter
 ① Turns/inch ② Turns/mm ③ mm ④ inches

➔ For more detailed information and explanations, refer to the technical manual.



Thread milling strategies

Process:

In contrast to tapping, where sections are cut out of the material, thread forming is a non-cutting, pressure forming procedure.

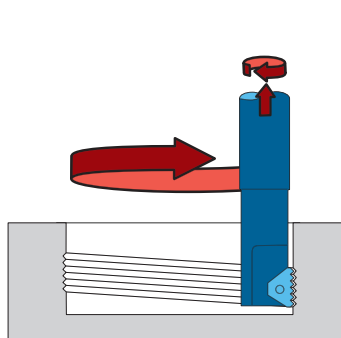
Advantages:

- No chip formation
- Up to 30% higher surface quality than with thread cutting
- Up to 40% higher processing speed than with thread cutting
- Threads in through holes and blind holes can be produced with the same tool
- Wide range of materials processable
- Cutting of thread eliminated
- Thread pitch and thread angle errors as with cut threads eliminated
- Shaped threads have higher strength owing to non-continuous cut

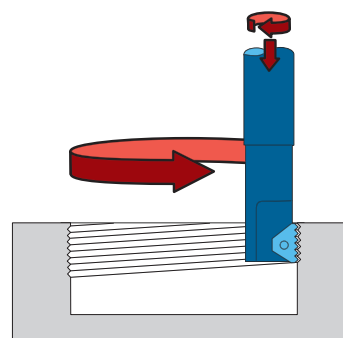
Requirements: For all shapeable materials with elongation >10 %.

When milling female threads, there are four different strategies for doing so.

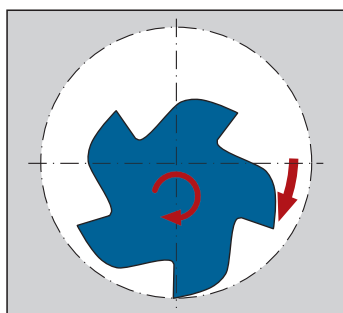
- Right-hand thread asynchronous milling: In this process, the start point is at the top and milling occurs downwards in a circular manner, against the direction of rotation.
- Right-hand thread, synchronous: In this process, the start point is at the bottom and milling occurs upwards in a circular manner (see diagram on the left).
- Left-hand thread asynchronous milling: In this process, the start point is at the bottom and milling occurs upwards in a circular manner, against the direction of rotation.
- Left-hand thread, synchronous: In this process, the start point is at the top and milling occurs downwards in a circular manner (see diagram on the left).



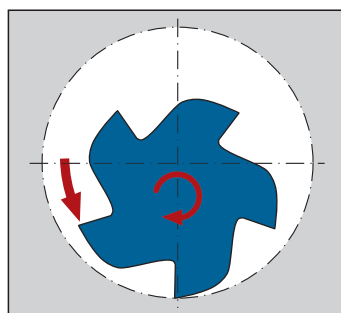
Right-hand thread, internal machining



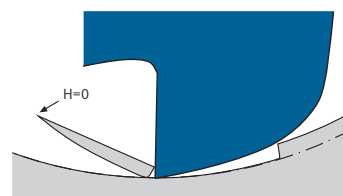
Left-hand thread, internal machining



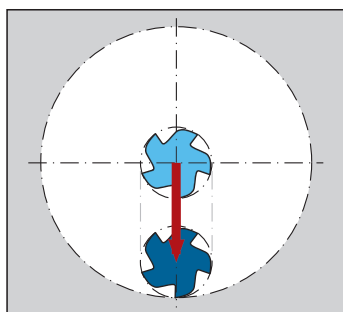
Asynchronous milling



Synchronous milling

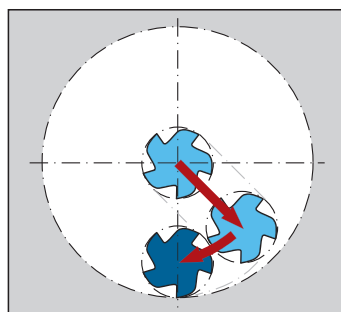


Synchronous milling can be recognised by the fact that, at the end of the cutter, chips are produced with $h=0$



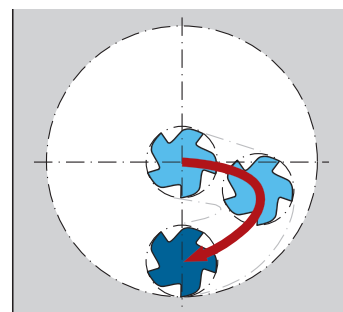
Straight insertion

When the thread milling cutter is inserted in a straight line, a very large wrap angle is generated, leading to long chips and a high tool load. This method also leaves a small dwell mark.



90° quarter circle descending loop

With the 90° descending loop, the majority of the chip volume is removed from the straight part of the descending loop. This has the advantage of making programming simpler and ensuring a relatively short descent.



180° semi-circle descending loop

The 180° descending loop offers the lowest tool load on descent because the wrap angle on the entire descending loop is relatively small. In terms of programming, this method is more complex, but has proved to be the most advantageous during thread milling and in terms of tool wear.

➡ For more detailed information and explanations, refer to the technical manual.



Internal cooling during thread milling

Internal cooling is of particular importance when it comes to thread milling. The short chips must be rinsed out of the working area by the coolant medium. Otherwise, the chips produced could damage the surface of the thread or even cause cavities on the tool.

We make a fundamental distinction between thread milling cutters with axial coolant flow, used for blind holes, and modified variants with radial coolant flow, which are ideal for through holes.



Thread milling cutters with axial coolant flow



Thread milling cutters with radial coolant flow



Clamping device recommendation for thread milling

	Collet chucks	Shrink-fit chucks	Hydro-expansion chucks	Surface chuck	Power chucks
Suitable for pitches up to 1.5 mm	○	○	○	●	●
Suitable for pitches above 1.5 mm			●	●	●
Vibration-damping	○	○	●	○	●
Surface quality	○	●	●	○	●

● = very well suited

● = suitable

○ = limited suitability



Types of thread milling cutter

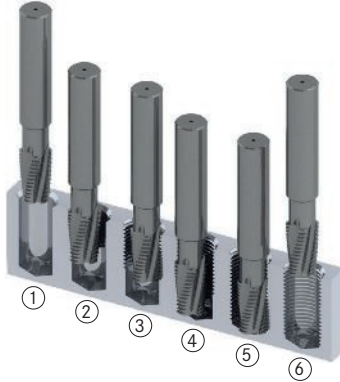
We distinguish between the following types of thread milling cutter:

Multi-range thread milling cutter without collar recess

The simple construction of the multi-range thread milling cutter makes it a cost-effective tool for milling female threads. With this type of cutter, two to three thread sizes can be produced at the same pitch above the specified nominal dimensions. Please note the relationship between milling diameter and thread size.



Multi-range thread milling cutter with collar recess



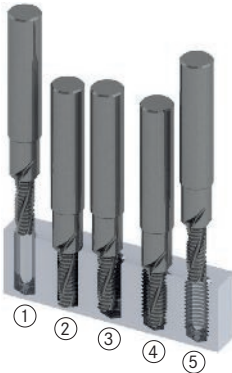
The multi-range thread milling cutter with collar recess is suitable for universal application. The collar recess enables very deep threads to be milled. With this type of cutter, all thread sizes can be produced at the same pitch above a nominal dimension.



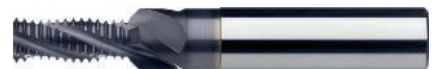
Process steps for thread milling cutter with collar recess:

- ① Tool moves to initial position, centred above drill hole
- ② Start of thread milling with descending loop
- ③ Milling of tread with subsequent ascending loop
- ④ Start of second thread milling program with descending loop
- ⑤ Milling of thread with subsequent ascending loop
- ⑥ Movement to initial position and end of machining procedure

Thread milling cutter with countersinking step



The thread milling cutter with countersinking step is characterised by the combination of countersinking and thread milling. With this type of cutter, two to three thread sizes can be produced at the same pitch above the specified nominal dimensions.



Process steps:

- ① Tool moves to start position centred on hole
- ② 90° bevel countersink
- ③ Begins thread milling with descending loop
- ④ Thread milling with subsequent ascending loop
- ⑤ Moves to start position and ends machining

Micro-thread milling cutter



Micro thread milling cutters allow threads to be produced reliably from M1 up to a thread depth of 5xD. Here, we differentiate between two tool geometries: A universal geometry covering all material groups up to 1500 N/mm² and a hard machining geometry, developed for hardened materials up to 63 HRC. With hard machining, the thread milling cutter is used in anti-clockwise rotation M04 to achieve the optimum service life.



Process steps:

- ① Tool moves to start position centred on hole
- ② 90° arc in
- ③ Thread milling
- ④ 90° arc out
- ⑤ Final position

Thread milling cutter with thread cutting insert

The advantages of thread milling are particularly apparent with larger threads. Due to the enormous cost of the solid carbide cutting material over the diameter range of 20 mm, supports made of steel or solid carbide and fitted with a solid carbide cutting insert can be used. With high projections or deep threads, a support made from solid carbide should be used to ensure sufficient rigidity. If the correct cutting insert has been selected, male threads can also be created. The cutting inserts are all in a full profile design and enable the production of high-precision thread.



Thread milling system with front milling cutter insert

The development of the thread milling system with front milling cutter insert has enabled the production of medium to large thread through a reliable process. Here, two support designs are also available in steel and solid carbide. In terms of cutting inserts, both partial and full-profile plates are available. Partial profile plates allow threads to be created with different pitches, and full-profile plates allow precise threads with one pitch.





multi-range thread milling cutter
for female thread milling



		IK	P	M	N	K	S	
13496560-612	Multi-range thread milling cutter, solid carbide TiAlN (M, MF) with axial internal cooling For universal use up to 1500 N/mm2 in female threads.	Internal	●	●	●	●	●	



micro-thread milling cutter type Uni
for female thread milling



		P	M	N	K	S	H 65HRC	
13496801-928	Solid carbide TiAlN 2xD thread milling cutter (M, MF) For universal use up to 1500 N/mm2 in female threads.	●	●	●	●	●		
13496930-958	Solid carbide TiAlN 3xD thread milling cutter. For universal use up to 1500 N/mm2 in female threads.	●	●	●	●	●		



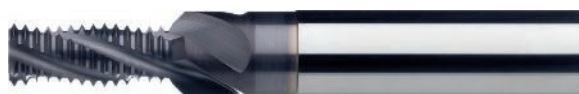
micro-thread milling cutter type hard
for female thread milling



		P	M	N	K	S	H 65HRC	
13496970-981	Solid carbide TiAlN 2xD thread milling cutter. For hard machining up to 63 HRC in female threads.						●	
13496990-998	Solid carbide TiAlN 3xD thread milling cutter (M, MF) For hard machining up to 63 HRC in female threads						●	



multi-range thread milling cutter with countersink
for female thread milling



		P	M	N	K	S	H 65HRC	
13496003-016	Multi-range thread milling cutter with 45° chamfer, solid carbide For universal use up to 1500 N/mm2, in female thread 1.5xD	●	●	●	●	●		
13496031-162	Multi-range thread milling cutter with 45° chamfer, solid carbide For universal use up to 1500 N/mm2, in female thread 2.0xD	●	●	●	●	●		
13496230-360	Multi-range thread milling cutter with 45° chamfer, solid carbide For universal use up to 1500 N/mm2, in female thread 2.5xD	●	●	●	●	●		



THE HIGHEST QUALITY PRODUCTS
FOR MAXIMUM EFFICIENCY.

WE HAVE WHAT IT TAKES.

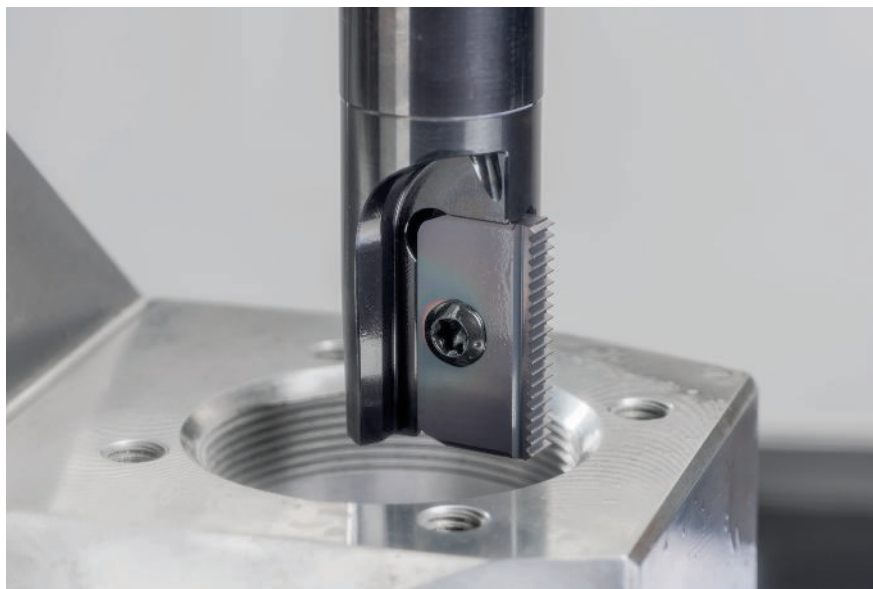


For a complete range of products that meet the toughest demands, visit www.iconridge.com



thread milling system with indexable insert
for universal use

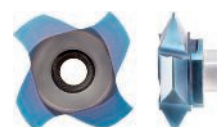
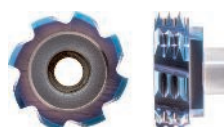
- Multi-cutter attachments ensure high production rates and long service life
- Innovative coating technology and cemented carbide mixtures for high service life and wide-ranging machining applications up to a hardness of 62 HRC
- Very high surface quality of thread
- Deep threads can be reliably produced



- innovative coating technology and cemented carbide mixtures for high service life and wide-ranging machining applications up to a hardness of 62 HRC
- very high surface quality of thread
- deep threads can be reliably produced



Thread milling system with front insert
For universal use



- multi-cutter attachments ensure high production rates and long service life
- innovative coating technology and cemented carbide mixtures for high service life and wide-ranging machining applications up to a hardness of 62 HRC
- very high surface quality of thread
- deep threads can be reliably produced

ORION HSS hand tap set in box (DIN 352)
for universal use up to 1000 N/mm²



Application:

For producing metric threads by hand in through holes and blind holes, in steel, non-ferrous metals and (cast iron) material groups up to a strength of 1000 N/mm².

two rings (Type D) and third tap (plug) (Type C) for M3, M4, M5, M6, M8, M10, M12

- **Ident. No. 020:** Hand tap set, HSS, comprising taper tap with one ring (Type A), second tap with two rings (Type D) and third tap (plug) (Type C) for M3, M4, M5, M6, M8, M10, M12 and core drills



Execution:

- **Ident. No. 010:** Hand tap set, HSS, comprising taper tap with one ring (Type A), second tap with

Advantage:

- Standard geometry with very good price/performance ratio

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
13396010	●	●					●	●	●	●	●	●								
13396020	●	●					●	●	●	●	●	●								

Cutting material	HSS	HSS
Composition of set	3 hand taps for each size (taper tap/second tap/third tap (plug)) M3/M4/M5/M6/M8/M10/M12	3 hand taps for each size (taper tap/second tap/third tap (plug)) M3/M4/M5/M6/M8/M10/M12, 1 of each core drill with diameter 2.5/3.3/4.2/5.0/6.8/8.5/10.2
Colour ring system	Steels	Steels
13396... Ident. No.	010	020

Prod. Gr. 1DC

ORION Thread-cutting tools sets
for universal use up to 1000 N/mm²



Application:

Ident. No. 312-900: for producing metric (M) male and female threads by hand in blind holes and through holes, in steel, non-ferrous metals and (cast-iron) material groups up to a strength of 1000 N/mm².

Ident. No. 902: for producing fine male and female metric threads (MF) by hand in blind holes and through holes, in steel, non-ferrous metals and (cast iron) material groups up to a strength of 1000 N/mm².

Ident. No. 904: for producing male and female pipe (G) threads by hand in blind holes and through holes, in steel, non-ferrous metals and (cast iron) material groups up to a strength of 1000 N/mm².

Execution:

- **Ident. No. 312:** Hand tap sets, HSS, comprising taper tap with one ring (Type A), second tap with two rings (Type D) and third tap (plug) (Type C) and die with tap wrench and thread gauge
- **Ident. No. 520-900:** Hand tap sets, HSS, comprising taper tap with one ring (Type A), second tap with two rings (Type D) and third tap (plug) (Type C) and die with tap wrench, die holder and thread gauge
- **Ident. No. 902-904:** Hand tap sets, HSS, comprising taper tap with one ring (Type A) and third tap (plug) (Type C) and die with tap wrench, die holder and thread gauge

Advantage:

- Standard geometry with very good price/performance ratio



Ident. No. 312-520, 904



Ident. No. 900



Ident. No. 902

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
13399312	●	●					●	●	●	●	●	●							
13399520	●	●					●	●	●	●	●	●							
13399900	●	●					●	●	●	●	●	●							
13399902	●	●					●	●	●	●	●	●							
13399904	●	●					●	●	●	●	●	●							

Application No.	Steel (N/mm ²)	Stainless steel	Alu	Brass	Bronze	Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.
13399... Ident. No.	312	520	900	902	904							

Composition of set	3 hand taps for each size (taper tap/second tap/third tap (plug)) and 1 die for each size M3/M4/M5/M6/M8/M10/M12	3 hand taps for each size (taper tap/second tap/third tap (plug)) and 1 die for each size M5/M6/M8/M10/M12/M14/M16/M18/M20	3 hand taps for each size (taper tap/second tap/third tap (plug)) and 1 die for each size M3/M4/M5/M6/M8/M10/M12/M14/M16/M18/M20/M22/M24	2 hand taps for each size (taper tap and third tap (plug)) and 1 die for each size M3x0.35/M4x0.35/M5x0.5/M6x0.75/M8x1/M10x1.25/M12x1.25/M14x1.5/M16x1.5/M18x1.5/M20x1.5/M22x1.5/M24x1.5	2 hand taps for each size (taper tap and third tap (plug)) and 1 die for each thread size 1/8"/1/4"/3/8"/1/2"/3/4"/1"
--------------------	------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------

ORION® Screw tap bit set for universal use up to 700 N/mm²



Application:

For producing metric threads for portable use on cordless drill screwdrivers in through holes, in steel, non-ferrous metals and (cast iron) material groups up to a strength of 700 N/mm² in single-part production.

M5, M6, M8, M10, M12 and magnetic steel tool holder for high requirements in terms of process reliability and service life

Advantage:

- Standard geometry with very good price/performance ratio

Execution:

- Precision-ground, right-hand and short machine tap set with 1/4" hexagon drive, HSS for M3, M4,

Number of pieces in assortment/set (PCS)	6
Composition of set	1 of each screw tap bit M3/M4/M5/M6/M8/M10
13407...	Ident. No. 550

Prod. Gr. 105



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
13407550	●	●				●	●	●	●	●	●	●								

ORION® Core drill bit set for universal use up to 700 N/mm²



Application:

For producing core holes for portable use on cordless drill screwdrivers, in steel, non-ferrous metals and (cast iron) material groups up to a strength of 700 N/mm² in single-part production.

M6, M8, M10 and M12 for high requirements in terms of process reliability and service life

Advantage:

- Standard geometry with very good price/performance ratio

Execution:

- Precision-ground, right-hand and short core drill set with 1/4" hexagon drive, HSS for M3, M4, M5,

Composition of set	1 of each core drill with diameter 2.5/3.3/4.2/5.0/6.8/8.5
13407...	Ident. No. 690

Prod. Gr. 105



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
13407690	●	●				●	●	●	●	●	●	●								

ORION® Combination thread bit for universal use up to 700 N/mm²



Application:

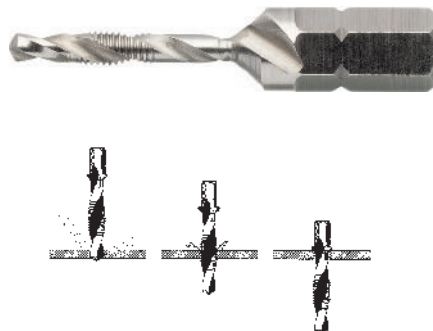
For producing metric threads (drill, thread, deburr and clean thread in one operation!) for portable use on cordless drill screwdrivers and hand drills in clockwise rotation and anti-clockwise rotation in steel, non-ferrous metals and (cast iron) material groups up to a strength of 700 N/mm² up to 1xD thread depth in single-part production.

Execution:

- Precision-ground, right-hand screw tap with drill step and 1/4" hexagon drive

Advantage:

- Standard geometry with very good price/performance ratio
- High productivity, since drilling, thread de-burring and thread cleaning are achieved in one operation
- Robust metal box protects the tool from damage and contamination



Tap drilling – thread cutting – deburring

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
13407030-100	●	●				●	●	●	●	●	●	●								

Thread tools \ Thread-cutting sets

Thread type x nominal Ø	Pitch (mm)	Length (mm)	Core hole Ø (mm)	Recommended rotation speed in steel (U/min(rpm))	Recommended rotation speed in aluminium (U/min(rpm))	13407... Ident. No.	
M3	0.5	36	2.5	1600	1900	030	●
M4	0.7	39	3.3	1200	1500	040	●
M5	0.8	41	4.2	950	1200	050	●
M6	1	44	5.0	800	950	060	●
M8	1.25	50	6.8	600	700	080	●
M10	1.5	59	8.5	450	550	100	●

Prod. Gr. 1DB

ORION® Combination thread bit set for universal use up to 700 N/mm²



Application:

For producing metric threads (drill, thread, deburr and clean thread in one operation!) for portable use on cordless drill screwdrivers and hand drills in clockwise rotation and anti-clockwise rotation in steel, non-ferrous metals and (cast iron) material groups up to a strength of 700 N/mm² up to 1xD thread depth in single-part production.

Execution:

- Precision-ground, right-hand screw tap set with drill step and 1/4" hexagon drive, HSS for M3, M4,

M5, M6, M8, M10 for high requirements in terms of process reliability and service life

Advantage:

- Standard geometry with very good price/performance ratio
- High productivity, since drilling, thread de-burring and thread cleaning are achieved in one operation
- Robust metal box protects the tool from damage and contamination



Tap drilling – thread cutting – deburring

Composition of set	1 of each combi screw tap bit M3/M4/M5/M6/M8/M10
13407...	Ident. No. 200

Prod. Gr. 1DB

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
13407200	●	●				●	●	●	●	●	●	●								



overview: threading dies



	Ø	P 700	P 1000	P 1300	M	N	K	S	
13410	M1-M36	●				○			
13412	M3 L-M24 L	●				○			
13418	M2-M24		●	●	●			●	
13421	M3-M20	●				○			
13440	MF2-MF63	●				○			
13442	MF8 L-MF24 L	●				○			
13446	MF5-MF30		●	●	●			●	
13450	UNC Nr.2-UNC 1 inch	●				○			
13460	UNF Nr.4-UNF 3/4 inch	●				○			
13466	NPT 1/8-NPT 3/4 inch	●				○			
13470	BSW 1/8-BSW 5/8 inch	●				○			
13480	G 1/8-G 2 inch	●				○			
13484	G 1/8-G 1 inch		●	●	●			●	



	Ø	P 700	P 1000	P 1300	M	N	K	S	
13487	G 1/8-G 1 1/4 inch	●				○			
13491	PG 7-PG 29	●							
13434	M3-M30	●				○			

ATORN® ORION® HSS threading die (EN standard 24231)
for universal use up to 700 N/mm²



G	HSS	A
---	-----	---

Application:

For cutting G (pipe) threads externally in the material groups of steel and non-ferrous metals up to a strength of 700 N/mm².

Execution:

- right die. tol. A with spiral point and 1.75 pitch

Advantage:

- No. 13480:**
 - universal use for maximum flexibility during application
 - micro cut edge treatment and special lapping method for excellent process reliability and long service life
- No. 13487:** standard geometry with excellent price/performance ratio



No. 13480



No. 13487

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
13480	●					●					●	●								
13487	●					●					●	●								

				ATORN®		ORION®						ATORN®		ORION®	
Cutting direction				Right-hand cutting		Right-hand cutting		Cutting direction				Right-hand cutting		Right-hand cutting	
Thread type x nominal Ø in inches	Number of thread starts per inch	Outer Ø (mm)	Height (mm)	13480... Ident. No.	13487... Ident. No.	13480... Ident. No.	13487... Ident. No.	Thread type x nominal Ø in inches	Number of thread starts per inch	Outer Ø (mm)	Height (mm)	13480... Ident. No.	13487... Ident. No.	13480... Ident. No.	13487... Ident. No.
G 1/8 in	28	30	11	010	●	010	●	G 5/8 in	14	55	16	-	-	050	●
G 1/4 in	19	38	10	020	●	020	●	G 1 in	11	65	18	080	●	080	●
G 3/8 in	19	45	14	030	●	030	●	G 7/8 in	14	65	18	-	-	070	●
G 1/2 in	14	45	14	040	●	040	●	G 1-1/4 in	11	75	20	-	-	100	●
G 3/4 in	14	55	16	060	●	060	●	G 1-1/2 in	11	90	22	120	●	-	-
								G 2 in	11	105	22	140	●	-	-

ORION = Prod. Gr. 1DC
ATORN® = Prod. Gr. 1KJ

ATORN® ORION® HSS threading die (EN standard 24231)
 For use in steel up to 1300 N/mm², stainless steel and special alloys



G	HSSE	A
---	------	---

Application:

No. 13484: For cutting G (pipe) threads externally in the material groups of steel, stainless steel, non-ferrous metals and special alloys up to a strength of 1300 N/mm².

No. 13488: For tapping male (pipe) threads in the steel, stainless steel, NF metal and special alloy material groups up to a strength of 1300 N/mm².

Execution:

▪ **No. 13484:** right die, tol. A with spiral point, nitrided, pre-slotted and 2.0 pitch

▪ **No. 13488:** Right-handed die, tol. A with spiral point, pre-slotted, 2.0-threaded chamfer

Advantage:

- **No. 13484:**
 - specialised application with optimised cutting geometry for use in difficult-to-machine materials
 - micro cut edge treatment and special lapping method for excellent process reliability and long service life
- **No. 13488:** Standard geometry with a very good price-performance ratio



No. 13484



No. 13488

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GJMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
13484		●	●	●	●						●				●	●	●		
13488		●	●	●	●						●				●	●	●		

Thread type x nominal Ø in inches	Number of thread starts per inch	Outer Ø (mm)	Height (mm)	Cutting direction	
				Right-hand cutting	Right-hand cutting
G 1/8 in	28	30	11	13484... 010	13488... 010
G 1/4 in	19	38	10	020	020
G 3/8 in	19	45	14	030	030
G 1/2 in	14	45	14	040	040
G 3/4 in	14	55	16	060	060
G 1 in	11	65	18	080	080

ORION = Prod. Gr. 1DC
 ATORN® = Prod. Gr. 1KJ

ATORN® ORION® HSS threading die (EN standard 22568)
 For universal use up to 700 N/mm²



MF	HSS	DIN 13 6g
----	-----	-----------

Application:

No. 13440: For tapping fine metric male threads in the steel and NF metal material groups up to a strength of 700 N/mm².

No. 13442–13445: For cutting fine metric threads externally in the material groups of steel and non-ferrous metals up to a strength of 700 N/mm².

Execution:

- **No. 13440:** Right-handed die, MF2 = tol. 6h, MF2.6 to MF50 = tol. 6g, MF63 = tol. 8g with spiral point, pre-slotted, 1.75-threaded chamfer
- **No. 13442:** left die, tol. 6 g with spiral point, pre-slotted and 1.75 pitch
- **No. 13445:** right die, tol. 6 g with spiral point, pre-slotted and 1.75 pitch

Advantage:

- **No. 13440:**
 - Universal use for maximum flexibility
 - Micro-cutting edge treatment and special lapping process for high process reliability and a long service life
- **No. 13442:**
 - universal use for maximum flexibility during application
 - micro cut edge treatment and special lapping method for excellent process reliability and long service life
- **No. 13445:** standard geometry with excellent price/performance ratio



No. 13440



No. 13442



No. 13445



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
13440	●	●				●					●	●							
13442	●	●				●					●	●							
13445	●	●				●					●	●							

				ATORN®		ORION®		ATORN®						ATORN®		ORION®		ATORN®	
Cutting direction				Right-hand cutting		Right-hand cutting		Left-hand cutting		Cutting direction				Right-hand cutting		Right-hand cutting		Left-hand cutting	
Thread type x nominal Ø	Pitch (mm)	Outer Ø (mm)	Height (mm)	13440... Ident. No.	13445... Ident. No.	13440... Ident. No.	13445... Ident. No.	13442... Ident. No.	13447... Ident. No.	Thread type x nominal Ø	Pitch (mm)	Outer Ø (mm)	Height (mm)	13440... Ident. No.	13445... Ident. No.	13442... Ident. No.	13447... Ident. No.	13440... Ident. No.	13445... Ident. No.
MF2	0.25	16	5	020 ●	-	-	-	-	-	MF20	2	45	14	206 ●	●	206 ●	●	-	-
MF2.6	0.35	16	5	026 ○	-	-	-	-	-	MF22	1	55	16	220 ●	●	-	-	-	-
MF3	0.35	20	5	030 ●	030 ●	-	-	-	-	MF22	1.5	55	16	223 ●	●	223 ●	●	-	-
MF4	0.35	20	5	040 ●	-	-	-	-	-	MF22	2	55	16	226 ●	●	-	-	-	-
MF4	0.5	20	5	045 ●	045 ●	-	-	-	-	MF24	1	55	16	240 ●	●	-	-	-	-
MF5	0.5	20	5	050 ●	050 ●	-	-	-	-	MF24	1.5	55	16	243 ●	●	243 ●	●	243 ○	-
MF6	0.5	20	5	060 ●	060 ●	-	-	-	-	MF24	2	55	16	246 ●	●	246 ●	●	-	-
MF6	0.75	20	7	065 ●	065 ●	-	-	-	-	MF25	1.5	55	16	250 ●	●	255 ●	●	-	-
MF7	0.75	25	9	070 ●	-	-	-	-	-	MF26	1.5	55	16	260 ●	●	-	-	-	-
MF8	0.5	25	9	080 ●	080 ●	-	-	-	-	MF27	2	65	18	275 ●	●	275 ●	●	-	-
MF8	0.75	25	9	083 ●	083 ●	083 ●	083 ●	-	-	MF27	1.5	65	18	-	-	270 ●	●	-	-
MF8	1	25	9	086 ●	086 ●	086 ●	086 ●	-	-	MF28	1.5	65	18	280 ●	●	-	-	-	-
MF9	1	25	9	090 ●	-	-	-	-	-	MF30	1.5	65	18	303 ●	●	303 ●	●	-	-
MF10	0.75	30	11	100 ●	-	-	-	-	-	MF30	2	65	18	306 ●	●	306 ●	●	-	-
MF10	1	30	11	103 ●	103 ●	103 ●	103 ●	-	-	MF32	1.5	65	18	320 ●	●	320 ●	●	-	-
MF10	1.25	30	11	106 ●	106 ●	-	-	-	-	MF33	1.5	65	18	330 ●	●	-	-	-	-
MF11	1	30	11	110 ●	-	-	-	-	-	MF33	2	65	18	335 ●	●	-	-	-	-
MF12	1	38	10	120 ●	120 ●	120 ●	120 ●	-	-	MF34	1.5	65	18	340 ●	●	-	-	-	-
MF12	1.25	38	10	123 ●	123 ●	-	-	-	-	MF35	1.5	65	18	350 ●	●	-	-	-	-
MF12	1.5	38	10	126 ●	126 ●	126 ●	126 ●	-	-	MF36	1.5	65	18	360 ●	●	-	-	-	-
MF14	1	38	10	140 ●	140 ●	-	-	-	-	MF36	2	65	18	363 ●	●	-	-	-	-
MF14	1.25	38	10	143 ●	143 ●	-	-	-	-	MF36	3	65	25	366 ●	●	-	-	-	-
MF14	1.5	38	10	146 ●	146 ●	146 ●	146 ●	-	-	MF40	1.5	75	20	400 ●	●	405 ●	●	-	-
MF15	1	38	10	150 ●	-	-	-	-	-	MF42	1.5	75	20	420 ●	●	-	-	-	-
MF16	1	45	14	160 ●	160 ●	-	-	-	-	MF42	2	75	20	423 ●	●	-	-	-	-
MF16	1.5	45	14	165 ●	165 ●	165 ●	165 ●	-	-	MF45	1.5	90	22	450 ●	●	-	-	-	-
MF18	1	45	14	180 ●	180 ●	-	-	-	-	MF48	1.5	90	22	480 ●	●	-	-	-	-
MF18	1.5	45	14	183 ●	183 ●	183 ●	183 ●	-	-	MF50	1.5	90	22	500 ●	●	505 ●	●	-	-
MF20	1	45	14	200 ●	200 ●	-	-	-	-	MF63	1.5	105	22	630 ●	○	-	-	-	-
MF20	1.5	45	14	203 ●	203 ●	203 ●	203 ●	-	-										

ORION = Prod. Gr. IDC
 ATORN® = Prod. Gr. 1KJ

ATORN® ORION® HSS threading die (EN standard 22568)
 For universal use and stainless steel



MF	HSSE	DIN 13 6g
----	------	-----------

Application:

For cutting fine metric threads externally in the material groups of steel, stainless steel, non-ferrous metals and special alloys up to a strength of 1300 N/mm².

Execution:

- right die. tol. 6 g with spiral point, nitrided, pre-slotted and 2.0 pitch

Advantage:

- No. 13446:**
 - specialised application with optimised cutting geometry for use in difficult-to-machine materials
 - micro cut edge treatment and special lapping method for excellent process reliability and long service life
- No. 13447:** standard geometry with excellent price/performance ratio



No. 13446



No. 13447

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
13446	●	●		●	●	●					●				●	●	●		
13447	●	●		●	●	●					●				●	●	●		

Thread tools \ Threading die MF

Cutting direction				ATORN®			ORION®			Cutting direction				ATORN®			ORION®		
Thread type x nominal Ø	Pitch (mm)	Outer Ø (mm)	Height (mm)	Right-hand cutting			Right-hand cutting			Thread type x nominal Ø	Pitch (mm)	Outer Ø (mm)	Height (mm)	Right-hand cutting			Right-hand cutting		
				13446... Ident. No.			13447... Ident. No.							13446... Ident. No.			13447... Ident. No.		
MF5	0.5	20	5	050	●	-	-	-	MF14	1.5	38	10	146	●	146	●			
MF6	0.75	20	7	065	●	-	-	-	MF16	1.5	45	14	165	●	165	●			
MF8	0.75	25	9	083	●	-	-	-	MF18	1.5	45	14	183	●	183	●			
MF8	1	25	9	086	●	086	●		MF20	1.5	45	14	203	●	203	●			
MF10	1	30	11	103	●	103	●		MF22	1.5	55	16	223	●	-	-			
MF12	1	38	10	120	●	120	●		MF24	1.5	55	16	243	●	-	-			
MF12	1.5	38	10	126	●	126	●		MF30	1.5	65	18	303	●	-	-			

ORION = Prod. Gr. 1DC
ATORN = Prod. Gr. 1KJ

ORION® HSS thread-cutting die (DIN 40434)

for universal use up to 700 N/mm²



Pg HSS

Application:

For tapping male armoured pipe threads in the steel, stainless steel, NF metals and special alloy material groups up to a strength of 700 N/mm².

Execution:

- Right-handed die with spiral point, pre-slotted, 1.75-threaded chamfer

Advantage:

- Innovative cutting geometry for high process reliability



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
13491	●											●								

Thread type x nominal Ø in inches	Number of thread starts per inch	Outer Ø (mm)	Height (mm)	Cutting direction		Right-hand cutting	
				13491... Ident. No.			
PG 7 in	20	38	10	070	○		
PG 9 in	18	38	10	090	○		
PG 11 in	18	45	14	110	●		
PG 13.5 in	18	45	14	135	●		
PG 16 in	18	55	16	160	●		
PG 21 in	16	65	18	210	○		
PG 29 in	16	65	18	290	○		

Prod. Gr. 1DC

ORION® Thread-cutting die HSS (EN standard 22568)

for universal use up to 700 N/mm²



M HSS DIN 13 6g

Application:

For tapping metric male threads in the steel and NF metal material groups up to a strength of 700 N/mm².

Execution:

- Right-handed die, M1 to M1.4 = tol. 6h, M1.6 to M36 = tol. 6g with spiral point (from M3), pre-slotted, 1.75-threaded chamfer

Advantage:

- Standard geometry with a very good price-performance ratio



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
13417	●					●						●	●							

Thread type x nominal Ø	Pitch (mm)	Outer Ø (mm)	Height (mm)	Cutting direction		Right-hand cutting		Thread type x nominal Ø	Pitch (mm)	Outer Ø (mm)	Height (mm)	Cutting direction		Right-hand cutting	
				13417... Ident. No.								13417... Ident. No.			
M2	0.4	16	5	020	●			M12	1.75	38	14	120	●		
M2.5	0.45	16	5	025	●			M14	2	38	14	140	●		
M3	0.5	20	5	030	●			M16	2	45	18	160	●		
M4	0.7	20	5	040	●			M18	2.5	45	18	180	●		
M5	0.8	20	7	050	●			M20	2.5	45	18	200	●		
M6	1	20	7	060	●			M22	2.5	55	22	220	●		
M7	1	25	9	070	●			M24	3	55	22	240	●		
M8	1.25	25	9	080	●			M27	3	65	25	270	●		
M10	1.5	30	11	100	●			M30	3.5	65	25	300	●		

Prod. Gr. 1DC

ORION® Thread-cutting die HSSE (EN standard 22568)
For universal use up to 1300 N/mm²



M	HSSE	DIN 13 6g
---	------	-----------

Application:

For tapping metric male threads in the steel, stainless steel, NF metal and special alloy material groups up to a strength of 1300 N/mm².

Execution:

- Right-handed die, tol. 6g with spiral point (from M2) and nitrided (from M3), pre-slotted, 2.0-threaded chamfer

Advantage:

- Standard geometry with a very good price-performance ratio



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
13421	●					●					●	●								

Cutting direction				Right-hand cutting	Cutting direction				Right-hand cutting
Thread type x nominal Ø	Pitch (mm)	Outer Ø (mm)	Height (mm)	13421... Ident. No.	Thread type x nominal Ø	Pitch (mm)	Outer Ø (mm)	Height (mm)	13421... Ident. No.
M3	0.5	20	5	030 ●	M10	1.5	30	11	100 ●
M4	0.7	20	5	040 ●	M12	1.75	38	14	120 ●
M5	0.8	20	7	050 ●	M14	2	38	14	140 ●
M6	1	20	7	060 ●	M16	2	45	18	160 ●
M8	1.25	25	9	080 ●	M20	2.5	45	18	200 ●

Prod. Gr. 1DC

ORION® HSS thread-cutting die set (EN standard 22568)
for universal use up to 700 N/mm²



M	HSSE	DIN 13 6g
---	------	-----------

Application:

For tapping metric male threads in the steel and NF metal material groups up to a strength of 700 N/mm².

Execution:

- Right-handed die set consisting of 13417 for M3, M4, M5, M6, M8, M10 and M12, tol. 6g with spiral point, pre-slotted, 1.75-threaded chamfer

Advantage:

- Standard geometry with an excellent price-performance ratio



Min./max. thread-cutting area, metric	3-12 mm
Number of pieces in assortment/set (PCS)	7
13417...	Ident. No. 500 ●

Prod. Gr. 1DC

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
13417500	●	●		●	●	●					●				●	●	●		

ORION® Machine tap extension

For using machine taps

Application:

For extending machine taps in conjunction with deep and difficult to reach threads on CNC and conventional machines, in tapping chucks or quick-change chucks in single part production.

Execution:

▪ Steel tool holder with collet chuck and clamping nut; steel shank of the extension pursuant to DIN for high requirements for process reliability and service life

Advantage:

- Very flexible and fast solution as there is no need to procure special machine taps
- User-friendly handling with short changeover times
- Excellent value for money



Suitable for DIN 371 screw tap	Suitable for DIN 374/376 screw tap	Suitable for screw tap square socket size (mm)	C (mm)	L7 (mm)	D1 (mm)	D4 (mm)	D3 (mm)	L (mm)	L4 (mm)	13533... Ident. No.	
M2-M2.6	M4	2.1	4.9	22	2.8	6.1	6	130	60	001	●
M2-M2.6	M4	2.1	4.9	22	2.8	6.1	6	230	70	011	○
M3	M4.5-M5	2.7	4.9	23	3.5	7.5	6	130	60	002	●
M3	M4.5-M5	2.7	4.9	23	3.5	7.5	6	230	70	020	●
M4	M6	3.4	4.9	23	4.5	8.4	6	130	60	003	●
M4	M6	3.4	4.9	23	4.5	8.4	6	230	70	030	●
M4.5-M6	M8	4.9	5.5	26	6	12.1	7	130	60	004	●
M4.5-M6	M8	4.9	5.5	26	6	12.1	7	230	70	040	●
M7	M9-M10	5.5	5.5	26	7	12.1	7	130	60	005	●
M7	M9-M10	5.5	5.5	26	7	12.1	7	230	70	050	●
M8	M11	6.2	6.2	30	8	13	8	130	60	006	●
M8	M11	6.2	6.2	30	8	13	8	230	80	060	●
M9	M12	7	7	31	9	15	9	130	60	007	●
M9	M12	7	7	31	9	15	9	230	80	070	●
M10	-	8	8	33	10	15	10	130	60	008	●
M10	-	8	8	33	10	15	10	230	80	080	●
-	M14	9	9	36	11	18	11	130	90	009	●
-	M14	9	9	36	11	18	11	230	90	090	●
-	M16	9	9	36	12	18	12	130	90	010	●
-	M16	9	9	36	12	18	12	230	90	111	●
-	M18	11	11	46	14	22	14	200	90	021	○
-	M18	11	11	46	14	22	14	330	90	121	○
-	M20	12	12	46	16	22	16	200	90	022	●
-	M20	12	12	46	16	22	16	330	90	122	●
-	M20-M24	14.5	14.5	47	18	26	18	200	100	023	●
-	M20-M24	14.5	14.5	47	18	26	18	330	100	123	○

Prod. Gr. 139

ORION® Tool extension

For screw taps with straight shanks and square drives

Application:

For extending machine taps for use with threads that are deep and difficult to reach.

Advantage:

- User-friendly handling with short changeover times
- Excellent value for money



Execution:

▪ Precision-ground steel tool holder, hardened and tempered with square drive pursuant to DIN 10

Technical data:

▪ Shank style: Reduced shank

Inner square size (mm)	Length (mm)	Size of square (mm)	13532... Ident. No.		Inner square size (mm)	Length (mm)	Size of square (mm)	13532... Ident. No.	
2.1	60	2.1	021	●	8	125	8	080	●
2.7	80	2.7	027	●	9	130	9	090	●
3	90	3	030	●	10	140	10	100	●
3.4	95	3.4	034	●	11	150	11	110	●
4.3	105	4.3	043	●	12	155	12	120	●
4.9	110	4.9	049	●	14.5	175	14.5	145	●
5.5	115	5.5	055	●	16.0	180	16	160	●
6.2	120	6.2	062	●	18	200	18	180	●
7	125	7	070	●	20	220	20	200	●
					22	220	22	220	●

Prod. Gr. 139

ORION® Fixed ball-type tap wrench

For holding screw taps and reamers

Application:

For mounting screw taps and reamers with square.

Execution:

- Steel tool holder with screw-off arm and 4 square holes to DIN 10

Advantage:

- High-quality steel with very good wear characteristics and chromium-plated extensions for high corrosion resistance
- User-friendly handling and short retooling times
- Excellent value for money



Tap wrench size	Square size	Min./max. thread-cutting area, metric	Min./max. thread-cutting area, imperial	Length (mm)	13545... Ident. No.	
0	2.1 mm/2.7 mm/3 mm/3.4 mm	1-4 mm	1/16-5/32 in	170	005	●
1	3 mm/3.4 mm/4.3 mm/4.9 mm	3.5-8 mm	5/32-5/16 in	195	010	●
2	3.4 mm/4.3 mm/4.9 mm/5.5 mm	4-10 mm	5/32-3/8 in	240	020	●
3	4.9 mm/5.5 mm/6.2 mm/7 mm	5-12 mm	3/16-1/2 in	290	030	●
4	5.5 mm/6.2 mm/7 mm/9 mm	10-16 mm	3/8-5/8 in	220	040	●

Prod. Gr. 109

ORION® Adjustable tap wrench, round version

for holding screw taps and reamers

Application:

For mounting very small screw taps and reamers with square.

Execution:

- Plastic tool holders with hardened steel jaws

Advantage:

- Ergonomic design for delicate, precise operations
- Hardened clamping jaws ensure low wear
- Highly compact, robust design



Suitable for square socket size (mm)	2.4
Min./max. thread-cutting area, metric	1-2.6 mm
Min./max. thread-cutting area, imperial	1/16-3/32 in
13547... Ident. No.	010 ●

Prod. Gr. 139

ORION® Adjustable tap wrench

For holding screw taps and reamers, with removable handle

Application:

For mounting screw taps and reamers with square.

Execution:

- No. 13549:** Housing, size 0-5 made from die-cast zinc, steel jaws ground and hardened with screw-off and galvanised arm with knurling for moderate requirements
- No. 13551:** Housing, size 1-2, made from forged steel, size 3-7/8, welded solid steel design, steel jaws ground and hardened, screw-off and galvanised arm with knurling for very high requirements

Advantage:

- User-friendly handling and short retooling times
- No. 13549:**
 - Die-cast zinc ensures excellent value for money
 - Highly compact, robust design
- No. 13551:**
 - Safe work even using high forces
 - Knurling ensures safe work, even with severe contamination



No. 13549



No. 13551

Tap wrench size	Suitable for min./max. square socket size	Min./max. reamer cutting range	Min./max. thread-cutting area, metric	Length (mm)	13549... Ident. No.		13551... Ident. No.	
0	2-5 mm	3-6 mm	1-8 mm	125	005	●	-	-
1	2-6 mm	3-7 mm	1-10 mm	180	010	●	010	●
1 1/2	2-8 mm	3-9 mm	1-12 mm	200	015	●	-	-
2	4-9 mm	5-9 mm	4-12 mm	280	020	●	020	●
3	4.9-12 mm	7-15 mm	5-20 mm	375	030	●	030	●
4	5.5-16 mm	7-21 mm	9-27 mm	480	040	●	040	●
5	7-20 mm	9-26 mm	12-33 mm	700	050	●	050	●
6	9-25 mm	16-30 mm	20-42 mm	960	-	-	060	●
7 8	16-44 mm	20-50 mm	27-86 mm	1200	-	-	070	●

Prod. Gr. 109

ORION® Thread-cutting die holder with manual clamp
For holding thread-cutting dies

Application:

For mounting closed and/or slotted dies to DIN EN 22568 and DIN EN 24231.

Advantage:

- User-friendly handling and short retooling times
- Knurling ensures safe work, even with severe contamination



Execution:

- Housing, size 0-12, made from die-cast zinc, size 13-17, made from steel and from size 7 with screw-off arm

Die holder size	Min./max. thread-cutting area, metric	Suitable for die size	Min./max. thread-cutting area, metric fine	Length (mm)	13559... Ident. No.	
0	1-2.6 mm	16 x 5 mm	-	160	005	●
1	27-36 mm	20 x 5 mm	3-4 mm	180	010	●
2	4.5-6 mm	20 x 7 mm	4.5-6 mm	180	020	●
3	7-9 mm	25 x 9 mm	7-9 mm	210	030	●
4	10-11 mm	30 x 11 mm	10-11 mm	270	040	●
5	-	38 x 10 mm	12-15 mm	310	050	●
6	10-14 mm	38 x 14 mm	-	310	060	●
7	-	45 x 14 mm	16-20 mm	440	070	●
8	10-23 mm	45 x 18 mm	-	440	080	●
9	-	55 x 16 mm	22-25 mm	490	090	●
10	22-24 mm	55 x 22 mm	-	490	100	●
11	-	65 x 18 mm	26-36 mm	630	110	●
12	27-36 mm	65 x 25 mm	-	630	120	●
13	-	75 x 20 mm	38-42 mm	900	130	●
14	39-42 mm	75 x 30 mm	-	900	140	●
15	-	90 x 22 mm	45-52 mm	920	150	●
16	45-52 mm	90 x 36 mm	-	920	160	●
17	-	105 x 22 mm	55-62 mm	1100	170	●

Prod. Gr. 109



core hole diameter for thread cutting and thread milling
standard metric ISO thread DIN 13

nominal dia.	pitch P	core hole (drill) Ø DIN 336	core dia. female thread 6H*	
			min. mm	max. mm
M 1	0,25	0,75	0,729	0,785
M 1.1	0,25	0,85	0,829	0,885
M 1.2	0,25	0,95	0,929	0,985
M 1.4	0,30	1,10	1,075	1,142
M 1.6	0,35	1,25	1,221	1,321
M 1.8	0,35	1,45	1,421	1,521
M 2	0,40	1,60	1,567	1,679
M 2.2	0,45	1,75	1,713	1,838
M 2.5	0,45	2,05	2,013	2,138
M 3	0,50	2,50	2,459	2,599
M 3.5	0,60	2,90	2,850	3,010
M 4	0,70	3,30	3,242	3,422
M 4.5	0,75	3,70	3,688	3,878
M 5	0,80	4,20	4,134	4,334
M 6	1,00	5,00	4,917	5,153
M 7	1,00	6,00	5,917	6,153
M 8	1,25	6,80	6,647	6,912
M 9	1,25	7,80	7,647	7,912
M 10	1,50	8,50	8,376	8,676

nominal dia.	pitch P	core hole (drill) Ø DIN 336	core dia. female thread 6H*	
			min. mm	max. mm
M 11	1,50	9,50	9,376	9,676
M 12	1,75	10,20	10,106	10,441
M 14	2,00	12,00	11,835	12,210
M 16	2,00	14,00	13,835	14,210
M 18	2,50	15,50	15,294	15,744
M 20	2,50	17,50	17,294	17,744
M 22	2,50	19,50	19,294	19,744
M 24	3,00	21,00	20,752	21,252
M 27	3,00	24,00	23,752	24,252
M 30	3,50	26,50	26,211	26,771
M 33	3,50	29,50	29,211	29,771
M 36	4,00	32,00	31,670	32,270
M 39	4,00	35,00	34,670	35,270
M 42	4,50	37,50	37,129	37,799
M 45	4,50	40,50	40,129	40,799
M 48	5,00	43,00	42,587	43,297
M 52	5,00	47,00	46,587	47,297
M 56	5,50	50,50	50,046	50,796

* M 1.1 to M 1.4 core dia. female thread 5H



core hole diameter for thread cutting and thread milling
metric ISO fine thread DIN 13

nominal dia. x pitch P	core hole (drill) Ø DIN 336	core dia. female thread 6H	
		min. mm	max. mm
M 2.5 x 0.35	2,15	2,121	2,221
M 3.0 x 0.35	2,65	2,621	2,721
M 3.5 x 0.35	3,15	3,121	3,221
M 4.0 x 0.50	3,50	3,459	3,599
M 4.5 x 0.50	4,00	3,959	4,099
M 5.0 x 0.50	4,50	4,459	4,599
M 5.5 x 0.50	5,00	4,959	5,099
M 6.0 x 0.75	5,20	5,188	5,378
M 7.0 x 0.75	6,20	6,188	6,378
M 8.0 x 0.50	7,50	7,459	7,599
M 8.0 x 0.75	7,20	7,188	7,378
M 8.0 x 1.00	7,00	6,917	7,153
M 9.0 x 0.75	8,20	8,188	8,378
M 9.0 x 1.00	8,00	7,917	8,153
M 10 x 0.75	9,20	9,188	9,378
M 10 x 1.00	9,00	8,917	9,153
M 10 x 1.25	8,80	8,647	8,912
M 11 x 0.75	10,20	10,188	10,378
M 11 x 1.00	10,00	9,917	10,153
M 12 x 1.00	11,00	10,917	11,153
M 12 x 1.25	10,80	10,647	10,912
M 12 x 1.50	10,50	10,376	10,676

nominal dia. x pitch P	core hole (drill) Ø DIN 336	core dia. female thread 6H	
		min. mm	max. mm
M 18 x 1.00	17,00	16,917	17,153
M 18 x 1.50	16,50	16,376	16,676
M 20 x 1.00	19,00	18,917	19,153
M 20 x 1.50	18,50	18,376	18,676
M 20 x 2.00	18,00	17,835	18,210
M 22 x 1.00	21,00	20,917	21,153
M 22 x 1.50	20,50	20,376	20,676
M 22 x 2.00	20,00	19,835	20,210
M 24 x 1.00	23,00	22,917	23,153
M 24 x 1.50	22,50	22,376	22,676
M 24 x 2.00	22,00	21,835	22,210
M 25 x 1.00	24,00	23,917	24,153
M 25 x 1.50	23,50	23,376	23,676
M 25 x 2.00	23,00	22,835	23,210
M 27 x 1.00	26,00	25,917	26,153
M 27 x 1.50	25,50	25,376	25,676
M 27 x 2.00	25,00	24,835	25,210
M 28 x 1.00	27,00	26,917	27,153
M 28 x 1.50	26,50	26,376	26,676
M 28 x 2.00	26,00	25,835	26,210
M 30 x 1.00	29,00	28,917	29,153
M 30 x 1.50	28,50	28,376	28,676



nominal dia. x pitch P mm	core hole (drill) Ø DIN 336 mm	core dia. female thread 6H	
		min. mm	max. mm
M 14 x 1.00	13,00	12,917	13,153
M 14 x 1.25	12,80	12,647	12,912
M 14 x 1.50	12,50	12,376	12,676
M 15 x 1.00	14,00	13,917	14,153
M 15 x 1.50	13,50	13,376	13,676
M 16 x 1.00	15,00	14,917	15,153
M 16 x 1.25	14,80	14,647	14,912
M 16 x 1.50	14,50	14,376	14,676
M 17 x 1.00	16,00	15,917	16,153
M 17 x 1.50	15,50	15,376	15,676

nominal dia. x pitch P mm	core hole (drill) Ø DIN 336 mm	core dia. female thread 6H	
		min. mm	max. mm
M 30 x 2.00	28,00	27,835	28,210
M 30 x 3.00	27,00	26,752	27,252
M 32 x 1.50	30,50	30,376	30,676
M 32 x 2.00	30,00	29,835	30,210
M 33 x 1.50	31,50	31,376	31,676
M 33 x 2.00	31,00	30,835	31,210
M 33 x 3.00	30,00	29,752	30,252
M 35 x 1.50	33,50	33,376	33,676
M 36 x 1.50	34,50	34,376	34,676

i core hole diameter for thread cutting and thread milling
UNC thread ASME B1.1

nominal dia.	gear per inch	core hole (drill) Ø DIN 336 mm	core dia. female thread 2B	
			min. mm	max. mm
No. 1-64	1,55	1,425	1,580	
No. 2-56	1,85	1,694	1,872	
No. 3-48	2,10	1,941	2,146	
No. 4-40	2,35	2,157	2,385	
No. 5-40	2,65	2,487	2,698	
No. 6-32	2,85	2,642	2,896	
No. 8-32	3,50	3,302	3,531	
No. 10-24	3,90	3,683	3,937	
No. 12-24	4,50	4,343	4,597	
1/4-20	5,10	4,978	5,258	
5/16-18	6,60	6,401	6,731	
3/8-16	8,00	7,798	8,153	
7/16-14	9,40	9,144	9,550	

nominal dia.	gear per inch	core hole (drill) Ø DIN 336 mm	core dia. female thread 2B	
			min. mm	max. mm
1/2-13	10,80	10,592	11,024	
9/16-12	12,20	11,989	12,446	
5/8-11	13,50	13,386	13,868	
3/4-10	16,50	16,307	16,840	
7/8-9	19,50	19,177	19,761	
1-8	22,25	21,971	22,606	
1 1/8-7	25,00	24,638	25,349	
1 1/4-7	28,00	27,813	28,524	
1 3/8-6	30,75	30,353	31,115	
1 1/2-6	34,00	33,528	34,290	
1 3/4-5	39,50	38,938	39,802	
2-4.5	45,00	44,679	45,593	

i core hole diameter for thread cutting and thread milling
MJ thread DIN ISO 5855

nominal dia. x pitch P mm	core hole (drill) dia. mm	core dia. female thread 5H*	
		min. mm	max. mm
MJ 3 x 0.50	2,60	2,513	2,653
MJ 4 x 0.70	3,40	3,318	3,498
MJ 5 x 0.80	4,30	4,221	4,421
MJ 6 x 0.50	5,55	5,513	5,625
MJ 6 x 0.75	5,35	5,269	5,419
MJ 6 x 1.00	5,10	5,026	5,216
MJ 8 x 0.50	7,55	7,513	7,625
MJ 8 x 0.75	7,35	7,269	7,419

nominal dia. x pitch P mm	core hole (drill) dia. mm	core dia. female thread 5H*	
		min. mm	max. mm
MJ 8 x 1.00	7,10	7,026	7,216
MJ 8 x 1.25	6,90	6,782	6,994
MJ 10 x 1.00	9,10	9,026	9,216
MJ 10 x 1.25	8,90	8,782	8,994
MJ 10 x 1.50	8,60	8,539	8,775
MJ 12 x 1.75	10,40	10,295	10,560
MJ 16 x 2.00	14,20	14,051	14,351

* MJ 3 x 0.50 to MJ 5 x 0.80 core dia. female thread 6H

i core hole diameter for thread cutting and thread milling
UNJC thread ISO 3161

nominal dia.	gear per inch	core hole (drill) dia. mm	core dia. female thread 3B	
			min. mm	max. mm
No. 6-32	2,85	2,733	2,939	
No. 8-32	3,55	3,393	3,599	
No. 10-24	4,00	3,795	4,064	
No. 12-24	4,60	4,455	4,704	
No. 1/4-20	5,30	5,113	5,387	
5/16-18	6,75	6,563	6,833	

nominal dia.	gear per inch	core hole (drill) dia. mm	core dia. female thread 3B	
			min. mm	max. mm
3/8-16	8,20	7,978	8,255	
7/16-14	9,60	9,346	9,639	
1/2-13	11,00	10,798	11,095	
9/16-12	12,40	12,228	12,482	
5/8-11	13,80	13,627	13,904	

i core hole diameter for thread cutting and thread milling
UNJF thread ISO 3161

nominal dia.	gear per inch	core hole (drill) dia. mm	core dia. female thread 3B	
			min. mm	max. mm
No. 6-40	3,00	2,888	3,053	
No. 8-36	3,60	3,480	3,663	

nominal dia.	gear per inch	core hole (drill) dia. mm	core dia. female thread 3B	
			min. mm	max. mm
3/8-24	8,60	8,494	8,679	
7/16-20	10,00	9,876	10,084	

Thread tools \ Core hole tables, thread cutting, thread forming, thread milling

nominal dia.	gear per inch	core hole (drill) dia. mm	core dia. female thread 3B	
			min. mm	max. mm
No. 10-32		4,20	4,054	4,255
No. 12-28		4,75	4,602	4,816
No. 1/4-28		5,60	5,466	5,662
5/16-24		7,00	6,906	7,109

nominal dia.	gear per inch	core hole (drill) dia. mm	core dia. female thread 3B	
			min. mm	max. mm
1/2-20		11,60	11,463	11,661
9/16-18		13,00	12,913	13,122
5/8-18		14,60	14,501	14,702



core hole diameter for thread cutting and thread milling UNF thread ASME B1.1

nominal dia.	gear per inch	core hole (drill) Ø DIN 336 mm	core dia. female thread 2B	
			min. mm	max. mm
No. 1-72		1,55	1,473	1,610
No. 2-64		1,85	1,755	1,910
No. 3-56		2,15	2,024	2,197
No. 4-48		2,40	2,271	2,459
No. 5-44		2,70	2,550	2,741
No. 6-40		2,95	2,819	3,023
No. 8-36		3,50	3,404	3,607
No. 10-32		4,10	3,962	4,166
No. 12-28		4,60	4,496	4,724
1/4-28		5,50	5,359	5,588
5/16-24		6,90	6,782	7,036
3/8-24		8,50	8,382	8,636

nominal dia.	gear per inch	core hole (drill) Ø DIN 336 mm	core dia. female thread 2B	
			min. mm	max. mm
7/16-20		9,90	9,728	10,033
1/2-20		11,50	11,328	11,608
9/16-18		12,90	12,751	13,081
5/8-18		14,50	14,351	14,681
3/4-16		17,50	17,323	17,678
7/8-14		20,40	20,269	20,650
1-12		23,25	23,114	23,571
1 1/8-12		26,50	26,289	26,746
1 1/4-12		29,50	29,464	29,921
1 3/8-12		32,75	32,639	33,096
1 1/2-12		36,00	35,814	36,271



core hole diameter for thread cutting and thread milling BSW (Whitworth) thread BS84

nominal dia.	gear per inch	core hole (drill) dia. mm	core dia. female thread	
			min. mm	max. mm
W 1/16	60	1,20	1,045	1,230
W 3/32	48	1,80	1,704	1,912
W 1/8	40	2,50	2,362	2,591
W 5/32	32	3,20	2,952	3,214
W 3/16	24	3,60	3,407	3,745
W 7/32	24	4,50	4,201	4,539
W 1/4	20	5,10	4,724	5,156
W 5/16	18	6,50	6,130	6,590
W 3/8	16	7,90	7,492	7,987
W 7/16	14	9,20	8,789	9,330
W 1/2	12	10,50	9,989	10,591
W 9/16	12	12,00	11,577	12,179

nominal dia.	gear per inch	core hole (drill) dia. mm	core dia. female thread	
			min. mm	max. mm
W 5/8	11	13,50	12,918	13,558
W 3/4	10	16,25	15,797	16,483
W 7/8	9	19,25	18,611	19,353
W 1	8	22,00	21,334	22,147
W 1 1/8	7	24,50	23,928	24,832
W 1 1/4	7	27,75	27,103	28,007
W 1 3/8	6	30,50	29,504	30,528
W 1 1/2	6	33,50	32,679	33,703
W 1 5/8	5	35,50	34,769	35,963
W 1 3/4	5	39,00	37,944	39,138
W 2	4,5	44,50	43,571	44,877



core hole diameter for thread cutting and thread milling (Whitworth) pipe thread (in accordance with DIN ISO 228-1)

nominal dia.	gear per inch	core hole (drill) Ø DIN 336 mm	core dia. female thread	
			min. mm	max. mm
G 1/16	28	6,80	6,561	6,843
G 1/8	28	8,80	8,566	8,848
G 1/4	19	11,80	11,445	11,890
G 3/8	19	15,25	14,950	15,395
G 1/2	14	19,00	18,631	19,172
G 5/8	14	21,00	20,587	21,128
G 3/4	14	24,50	24,117	24,658

nominal dia.	gear per inch	core hole (drill) Ø DIN 336 mm	core dia. female thread	
			min. mm	max. mm
G 7/8	14	28,25	27,877	28,418
G 1	11	30,75	30,291	30,931
G 1 1/8	11	35,50	34,939	35,579
G 1 1/4	11	39,50	38,952	39,592
G 1 1/2	11	45,25	44,845	45,485
G 1 3/4	11	51,00	50,788	51,428
G 2	11	57,00	56,656	57,296



core hole diameter for thread cutting and thread milling steel-armoured pipe thread according to DIN 40430

nominal dia.	gear per inch	core hole (drill) dia. mm	core dia. female thread	
			min. mm	max. mm
Pg 7	20	11,40	11,280	11,430
Pg 9	18	14,00	13,860	14,010
Pg 11	18	17,30	17,260	17,410
Pg 13.5	18	19,00	19,060	19,210
Pg 16	18	21,30	21,160	21,310

nominal dia.	gear per inch	core hole (drill) dia. mm	core dia. female thread	
			min. mm	max. mm
Pg 21	16	26,90	26,780	27,030
Pg 29	16	35,50	35,480	35,730
Pg 36	16	45,50	45,480	45,730
Pg 42	16	52,50	52,480	52,730
Pg 48	16	57,80	57,780	58,030



core hole diameter for thread cutting and thread milling
EG thread metr./metr. fine (EG M 14 x 1.25) for thread inserts DIN 8140

nominal dia.	pitch P mm	core hole (drill) dia. mm	core dia. female thread	
			min. mm	max. mm
EG M 4	0,70	4,20	4,152	4,292
EG M 5	0,80	5,25	5,174	5,334
EG M 6	1,00	6,30	6,217	6,407
EG M 8	1,25	8,40	8,271	8,483

nominal dia.	pitch P mm	core hole (drill) dia. mm	core dia. female thread	
			min. mm	max. mm
EG M 10	1,50	10,50	10,324	10,560
EG M 12	1,75	12,50	12,379	12,644
EG M 14	1,25	14,40	14,271	14,483
EG M 16	2,00	16,50	16,433	16,733



core hole diameter for thread cutting and thread milling
EG UNC (UNC-STI) thread for threaded wire inserts ASME B18.29.1

nominal dia.	gear per inch	core hole (drill) dia. mm	core dia. female thread	
			min. mm	max. mm
EG no. 6-32		3,80	3,678	3,879
EG no. 8-32		4,40	4,338	4,524
EG no. 10-24		5,20	5,055	5,283
EG no. 12-24		5,80	5,715	5,944
EG 1/4-20		6,70	6,624	6,868
EG 5/16-18		8,40	8,242	8,489

nominal dia.	gear per inch	core hole (drill) dia. mm	core dia. female thread	
			min. mm	max. mm
EG 3/8-16		10,00	9,868	10,127
EG 7/16-14		11,60	11,506	11,783
EG 1/2-13		13,30	13,122	13,393
EG 9/16-12		14,90	14,747	15,032
EG 5/8-11		16,50	16,375	16,673



core hole diameter for thread cutting and thread milling
EG UNF (UNF-STI) thread for thread wire inserts ASME B18.29.1

nominal dia.	gear per inch	core hole (drill) dia. mm	core dia. female thread	
			min. mm	max. mm
EG no. 6-40		3,70	3,644	3,818
EG no. 8-36		4,40	4,321	4,498
EG no. 10-32		5,10	4,999	5,184
EG no. 12-28		5,70	5,682	5,809
EG 1/4-28		6,60	6,546	6,721
EG 5/16-24		8,25	8,166	8,352

nominal dia.	gear per inch	core hole (drill) dia. mm	core dia. female thread	
			min. mm	max. mm
EG 3/8-24		9,80	9,754	9,931
EG 7/16-20		11,50	11,389	11,585
EG 1/2-20		13,10	12,974	13,172
EG 9/16-18		14,70	14,592	14,798
EG 5/8-18		16,25	16,180	16,386



core hole diameter for thread cutting and thread milling
NPT ANSI B 2.1 Americ. tapered pipe thread, taper 1:16

nominal dia.	gear per inch	core hole dia. cylindr. (A) d _i	core hole dia. conical (B) D _i	incision depth ET mm	drilling depth BT min. mm
1/16-27		6,15	6,39	9,29	10,7
1/8-27		8,40	8,74	9,32	10,8
1/4-18		11,10	11,36	13,52	15,6
3/8-18		14,30	14,80	13,83	16,0
1/2-14		17,90	18,32	18,07	20,8
3/4-14		23,30	23,67	18,55	21,3

nominal dia.	gear per inch	core hole dia. cylindr. (A) d _i	core hole dia. conical (B) D _i	incision depth ET mm	drilling depth BT min. mm
1-11.5		29,00	29,69	22,29	25,6
1 1/4-11.5		37,70	38,45	22,80	26,1
1 1/2-11.5		43,70	44,52	22,80	26,1
2-11.5		55,60	56,56	23,20	26,5
2 1/2-8		66,30	67,62	31,75	36,3
3-8		82,30	83,52	33,74	38,5



recommended drill diameter for thread forming
metric ISO thread DIN 13

nominal dia.	pitch P mm	drilling dia. mm	drilling dia.		core dia. female thread 7H*	
			min. mm	max. mm	min. mm	max. mm
M 1	0,25	0,90	0,89	0,92	0,729	0,819
M 1.2	0,25	1,10	1,09	1,12	0,929	1,019
M 1.4	0,30	1,28	1,27	1,30	1,075	1,181
M 1.6	0,35	1,46	1,45	1,48	1,221	1,346
M 1.7	0,35	1,56	1,55	1,58	1,321	1,446
M 1.8	0,35	1,66	1,65	1,68	1,421	1,546
M 2	0,40	1,85	1,84	1,88	1,567	1,679
M 2.2	0,45	2,00	2,01	2,05	1,713	1,838
M 2.5	0,45	2,30	2,28	2,32	2,013	2,138
M 3	0,50	2,80	2,78	2,85	2,459	2,639
M 3.5	0,60	3,25	3,23	3,30	2,850	3,050
M 4	0,70	3,70	3,68	3,76	3,242	3,466
M 4.5	0,75	4,20				
M 5	0,80	4,65	4,62	4,71	4,134	4,384

nominal dia.	pitch P mm	drilling dia. mm	drilling dia.		core dia. female thread 7H*	
			min. mm	max. mm	min. mm	max. mm
M 9	1,25	8,40	8,36	8,47	7,647	7,982
M 10	1,50	9,30	9,26	9,38	8,376	8,751
M 11	1,50	10,30	10,26	10,38	9,376	9,751
M 12	1,75	11,20	11,15	11,29	10,106	10,531
M 14	2,00	13,10	13,05	13,20	11,835	12,310
M 16	2,00	15,10	15,05	15,20	13,835	14,310
M 18	2,50	16,90	16,83	17,02	15,294	15,854
M 20	2,50	18,90	18,83	19,02	17,294	17,854
M 22	2,50	20,90	20,83	21,02	19,294	19,854
M 24	3,00	22,70	22,62	22,80	20,752	21,382
M 27	3,00	25,70	25,62	25,80	23,752	24,382
M 30	3,50	28,50	28,40	28,60	26,211	26,921
M 33	3,50	31,50	31,40	31,60	29,211	29,921
M 36	4,00	34,30	34,17	34,40	31,670	32,420

Thread tools \ Core hole tables, thread cutting, thread forming, thread milling

nominal dia.	pitch P mm	drilling dia. mm	drilling dia.		core dia. female thread 7H*	
			min. mm	max. mm	min. mm	max. mm
M 6	1,00	5,55	5,52	5,62	4,917	5,217
M 7	1,00	6,55	6,52	6,62	5,917	6,217
M 8	1,25	7,40	7,36	7,47	6,647	6,982

* M 2 to M 2.5 core dia. female thread 6H

nominal dia.	pitch P mm	drilling dia. mm	drilling dia.		core dia. female thread 7H*	
			min. mm	max. mm	min. mm	max. mm
M 39	4,00	37,30	37,17	37,40	34,670	35,420
M 42	4,50	40,10	39,95	40,20	37,129	37,979



recommended drill diameter for thread forming metric ISO fine thread DIN 13

nominal dia. x pitch P mm	drilling dia. mm	drilling dia.		core dia. female thread 7H*	
		min. mm	max. mm	min. mm	max. mm
M 2.5 x 0.35	2,35	2,35	2,38	2,121	2,221
M 3 x 0.35	2,85	2,85	2,88	2,621	2,721
M 4 x 0.35	3,85	3,85	3,88	3,621	3,721
M 4 x 0.50	3,80	3,78	3,83	3,459	3,639
M 5 x 0.50	4,80	4,78	4,83	4,459	4,639
M 5.5 x 0.50	5,30	5,28	5,33	4,959	5,139
M 6 x 0.75	5,65	5,62	5,70	5,188	5,424
M 7 x 0.75	6,65	6,62	6,70	6,188	6,424
M 8 x 0.75	7,65	7,62	7,70	7,188	7,424
M 8 x 1.00	7,55	7,52	7,62	6,917	7,217
M 9 x 0.75	8,65	8,62	8,70	8,188	8,424
M 9 x 1.00	8,55	8,52	8,62	7,917	8,217
M 10 x 0.75	9,65	9,62	9,70	9,188	9,424
M 10 x 1.00	9,55	9,52	9,62	8,917	9,217
M 10 x 1.25	9,40	9,36	9,47	8,647	8,982
M 11 x 0.75	10,65	10,62	10,70	10,188	10,424
M 11 x 1.00	10,55	10,52	10,62	9,917	10,217
M 12 x 1.00	11,55	11,52	11,62	10,917	11,217
M 12 x 1.25	11,40	11,36	11,47	10,647	10,982
M 12 x 1.50	11,30	11,26	11,38	10,376	10,751
M 14 x 1.00	13,55	13,52	13,62	12,917	13,217
M 14 x 1.25	13,40	13,36	13,47	12,647	12,982

* M 2.5 x 0.35 to M 4 x 0.35 core dia. female thread 6H

nominal dia.	drilling dia. mm	drilling dia.		core dia. female thread 7H*	
		min. mm	max. mm	min. mm	max. mm
M 14 x 1.50	13,30	13,26	13,38	12,376	12,751
M 15 x 1.00	14,55	14,52	14,62	13,917	14,217
M 15 x 1.50	14,30	14,26	14,38	13,376	13,751
M 16 x 1.00	15,55	15,52	15,62	14,917	15,217
M 16 x 1.50	15,30	15,26	15,38	14,376	14,751
M 17 x 1.00	16,55	16,52	16,62	15,917	16,217
M 17 x 1.50	16,30	16,26	16,38	15,376	15,751
M 18 x 1.00	17,55	17,52	17,62	16,917	17,217
M 18 x 1.50	17,30	17,26	17,38	16,376	16,751
M 18 x 2.00	17,10	17,05	17,20	15,835	16,310
M 20 x 1.00	19,55	19,52	19,62	18,917	19,217
M 20 x 1.50	19,30	19,26	19,38	18,376	19,751
M 24 x 1.00	23,55	23,52	23,62	22,917	23,217
M 24 x 1.50	23,30	23,26	23,38	22,376	22,751
M 24 x 2.00	23,10	23,05	23,20	21,835	22,310
M 27 x 1.50	26,30	26,26	26,38	25,376	25,751
M 30 x 1.50	29,30	29,26	29,38	28,376	28,751
M 33 x 1.50	32,30	32,26	32,38	31,376	31,751
M 36 x 1.50	35,30	35,26	35,38	34,376	34,751
M 39 x 1.50	38,30	38,26	38,38	37,376	37,751
M 42 x 1.50	41,30	41,26	41,38	42,376	42,751



recommended drill diameter for thread forming UNC thread ASME B1.1

nominal dia.	gear per inch	drilling dia. mm	drilling dia.		core dia. female thread 2B	
			min. mm	max. mm	min. mm	max. mm
No. 1-64		1,68	1,67	1,70	1,425	1,580
No. 2-56		1,98	1,97	2,01	1,694	1,872
No. 3-48		2,28	2,27	2,32	1,941	2,146
No. 4-40		2,55	2,54	2,59	2,157	2,385
No. 5-40		2,90	2,89	2,94	2,487	2,698
No. 6-32		3,15	3,14	3,19	2,642	2,896
No. 8-32		3,80	3,78	3,82	3,302	3,531
No. 10-24		4,35	4,33	4,39	3,683	3,937
No. 12-24		5,00	4,97	5,03	4,343	4,597
1/4-20		5,75	5,72	5,80	4,978	5,258

nominal dia.	gear per inch	drilling dia. mm	drilling dia.		core dia. female thread 7H*	
			min. mm	max. mm	min. mm	max. mm
5/16-18		7,30	7,26	7,37	6,401	6,731
3/8-16		8,80	8,77	8,88	7,798	8,153
7/16-14		10,30	10,27	10,37	9,144	9,550
1/2-13		11,80	11,77	11,88	10,592	11,024
9/16-12		13,30	13,28	13,39	11,989	12,446
5/8-11		14,80	14,78	14,90	13,386	13,868
3/4-10		17,90	17,85	17,97	16,307	16,840
7/8-9		21,00	20,95	21,10	19,177	19,761
1-8		24,00	23,95	24,12	21,971	22,606



recommended drill diameter for thread forming UNF thread ASME B1.1

nominal dia.	gear per inch	drilling dia. mm	drilling dia.		core dia. female thread 2B	
			min. mm	max. mm	min. mm	max. mm
No. 1-72		1,68	1,67	1,70	1,425	1,580
No. 2-64		1,98	1,97	2,01	1,694	1,872
No. 3-56		2,28	2,27	2,32	1,941	2,146
No. 4-48		2,55	2,54	2,59	2,157	2,385
No. 5-44		2,90	2,89	2,94	2,487	2,698
No. 6-40		3,15	3,14	3,19	2,642	2,896
No. 8-36		3,80	3,78	3,82	3,302	3,531
No. 10-32		4,35	4,33	4,39	3,683	3,937
No. 12-28		5,00	4,97	5,03	4,343	4,597
1/4-28		5,75	5,72	5,80	4,978	5,258

nominal dia.	gear per inch	drilling dia. mm	drilling dia.		core dia. female thread 7H*	
			min. mm	max. mm	min. mm	max. mm
5/16-24		7,30	7,26	7,37	6,401	6,731
3/8-24		8,80	8,77	8,88	7,798	8,153
7/16-20		10,30	10,27	10,37	9,144	9,550
1/2-20		11,80	11,77	11,88	10,592	11,024
9/16-18		13,30	13,28	13,39	11,989	12,446
5/8-18		14,80	14,78	14,90	13,386	13,868
3/4-16		17,90	17,85	17,97	16,307	16,840
7/8-14		21,00	20,95	21,10	19,177	19,761
1-12		24,00	23,95	24,12	21,971	22,606



recommended drill diameter for thread forming

(Whitworth) pipe thread G DIN EN ISO 228-1

nominal dia.	gear per inch	drilling dia. mm	drilling dia.		core dia. female thread 2B	
			min. mm	max. mm	min. mm	max. mm
G 1/16	28	7,30	7,28	7,35	6,561	6,843
G 1/8	28	9,30	9,28	9,35	8,566	8,848
G 1/4	19	12,50	12,48	12,55	11,445	11,890
G 3/8	19	16,00	15,98	16,05	14,950	15,395
G 1/2	14	20,00	19,98	20,12	18,631	19,172

nominal dia.	gear per inch	drilling dia. mm	drilling dia.		core dia. female thread 7H*	
			min. mm	max. mm	min. mm	max. mm
G 5/8	14	22,00	21,98	22,12	20,587	21,128
G 3/4	14	25,50	25,48	25,62	24,117	24,658
G 7/8	14	29,25	29,23	29,37	27,877	28,418
G 1	11	32,00	31,98	32,15	30,291	30,931
G 1 1/4	11	40,75	40,70	40,85	38,952	39,592

i Sawing process

Sawing is a process of separation involving circular or straight cutting movements to sever or cut semi-finished products or profile material. The material is cut by the cutting teeth of the saw. The resulting chip material is transported out of the kerf between the gaps in the teeth.

The following saw forms are distinguishable:

Circular saws



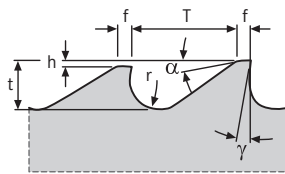
Bandsaws



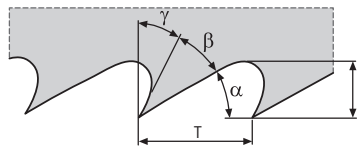
i Angle and pitch at saw tooth

The size of the angle is defined by the shape of the saw blade. The clearance angle defines the size of the chip space. As the size of the clearance angle increases, so does the size of the chip space.

The lip angle in turn gives the saw tooth stability. Hard and tough materials therefore require a large lip angle. In general, the lip angle is approximately 50°; the clearance and lip angle together are approx. 90°.



Circular saws



Bandsaws

- α clearance angle (°)
- β lip angle (°)
- γ chip angle (°)
- T tooth pitch (mm)
- t tooth depth (mm)
- h height difference (mm)
- f clearance angle chamfer (mm)
- r curvature radius (mm)

i Cutting materials on metal circular saws

When separating and cutting slots (grooves), the following cutting materials are used.

HSS HSS metal circular saws can be used in materials up to 1000 N/mm². This cutting material can also be used in materials up to 1300 N/mm² under certain conditions (increased wear). The cutting material has high bending strength and can be used with unstable machine conditions. The cutting speed is relatively low when machining with this cutting material.

HSSE Metal circular saws made from HSSE cutting material can be used in materials up to 1300 N/mm². The addition of cobalt allows even difficult materials with high toughness or hardness to be processed. This cutting material has a high flexural strength and can be used in unstable machining conditions. The cutting speed can be slightly increased compared to HSS circular saws.

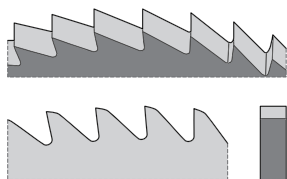
VHM Metal circular saws made of cemented carbide cutting material can be used in all materials. This cutting material allows difficult materials with high toughness or hardness to be processed. The cutting material has a low flexural strength and can only be used in stable machines and clamping conditions. However, the low bending resistance is an advantage in terms of machining accuracy. Carbide-tipped circular saw blades have a carbide piece soldered onto a steel support. This technology shows its benefits particularly when it comes to machining non-ferrous metals.



Tooth shapes for metal circular saws

When machining with metal circular saw blades, the selection of tooth shape is crucial in the various machining tasks. A distinction is made between the following tooth shapes and their applications:

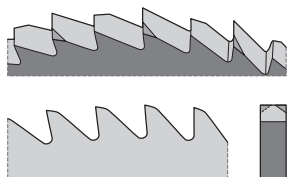
SHAPE A - Metal circular saw blades DIN 1837 A (fine-toothed with angular serration)



Tooth shape A has been developed for working with brittle, short-chipping materials. For this kind of toothing, the chip space is relatively small and can hold only a small volume of chips. The low tooth pitch and low chip volume make the saw blade only suitable for low cutting depths or thin-walled materials.

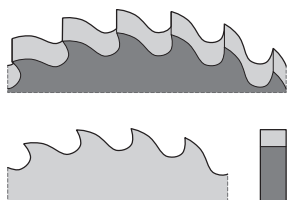
Tooth pitches < 2 are suitable for cutting depths down to 4 mm. Tooth pitches > 2 are suitable for cutting depths greater than 15 mm or Cross-section possible.

SHAPE Aw – Metal circular saw blades DIN 1837 Aw (fine-toothed with alternating toothing)



Tooth shape AW has been developed for cutting of thin-walled profiles with low cut depths. With this tooth shape, the chip spaces are relatively small and only a small volume of chips can be accepted.

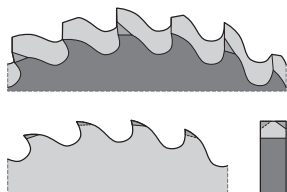
SHAPE B - Metal circular saw blades DIN 1838 B (coarse-toothed with arc serration)



SHAPE Bw - Metal circular saw blades DIN 1838 Bw (coarse-toothed with alternating toothing)

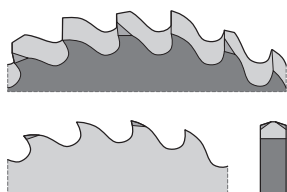
Tooth shape B has been developed for cutting solid material with high cutting depths. For this kind of toothing, the chip space is relatively large and can hold a large volume of chips. It is therefore used universally in numerous applications. The tooth spacing allows 30% greater chip volume. This tooth shape caters to tough as well as soft materials. Depending on the blade thickness, the tooth pitches range from 3.15 to 12.5 mm. Components with cutting depths and diameters up to max. 100 mm can be sawed.

SHAPE Bw - Metal circular saw blades DIN 1838 Bw (coarse-toothed with alternating toothing)



Tooth shape Bw has been developed for cutting solid material with high cutting depths (applications with cutting depths in excess of 5% of the saw blade diameter). This tooth shape produces narrower chips and allows the chip material to expand laterally (heat-induced). This tooth shape caters to tough as well as soft materials. The chips are 1/3 narrower and reduce the cutting forces at the tooth base by 30%. More space is created for the coolant in the area to be cut.

SHAPE C - Metal circular saw blades DIN 1838 C (coarse-toothed with arc serration with pre- and post-cutter = HZ serration)



Tooth shape C is used to separate materials. Owing to its chip-separating tooth shape, it works especially well when machining materials of low to medium strength thanks to high cutting performance.

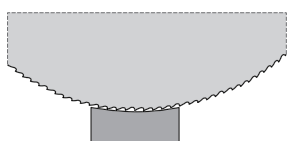
Tooth shape C is best used to produce very deep cuts and with large diameters when cutting workpieces. When creating grooves, a groove caused by the over-height taper tap is created at the cut base. A flat cut base is therefore not achieved. The radius of the taper tap is 0.1–0.3 mm higher than the following tooth.

Large saw blades therefore have better guidance and thus more precise cutting.

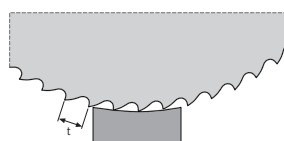


Number of contact teeth on metal circular saws

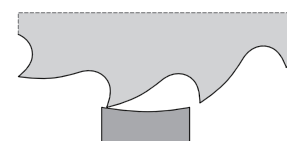
When selecting the number of teeth, it is important that two to three teeth are in use. If too many teeth are in use, the cutting forces are too high and it leads to saw blade breakage. If too few teeth are in use, too much cutting performance is being expected per tooth. The following graphics illustrate the relationship.



Too fine



Correct



Correct

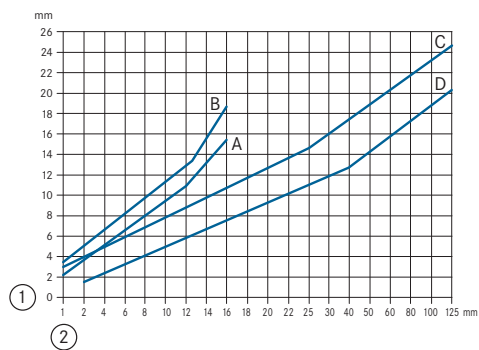
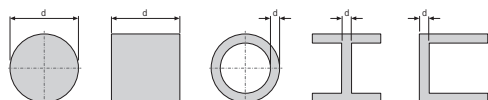


Tooth pitch selection table for machine saw blades

When selecting the tooth pitch, the cross-section of the workpiece to be machined is the key consideration. The following ratio essentially applies: The smaller the cross-section to be machined, the lower the pitch. As a rule of thumb, 2-3 teeth should always be engaged.

The chart illustrates the ratio:

Material	Pipes / Profiles	Solid material
Steel < 800 Nmm ²	B	D
Steel 800 to 1200 N/mm ²	C	D
Grey cast iron		D
Copper	B	C
Bronze	B	C
Brass, zinc alloys	A	D
Aluminium alloys	B	C



① Pitch in mm ② Cross-section d in mm

ORION® Circular metal saw blade, HSS, finely toothed, type A (DIN 1837)
Up to 1000 N/mm² in thin-walled workpieces and low cutting depths, CNC machines



Application:

For producing saw cuts in thin-walled workpieces and shallow cutting depths, in steel, (stainless steel), cast iron and (non-ferrous metals) material groups up to a strength of 1000 N/mm².

Execution:

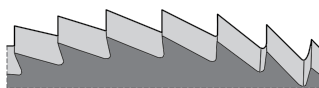
- Precision-ground circular metal saw blade with tooth shape A, finely toothed, laterally hollow ground, hole without keyway, up to a diameter of 160 mm without collar, from a diameter of 200 mm with collar

Advantage:

- Innovative cutting geometry ensures very high dimensional accuracy, process reliability and chip removal
- High-quality cutting material for very high service life requirements
- Universal use in numerous applications

Technical data:

- Tolerance of cutting edge diameter: js15
- Tolerance of cutting edge thickness: js11
- Tolerance of hole diameter: H7



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
14002	45	35	20	10	10	230	300	120	100	70	80	60		35						

D (mm)	T (mm)	B (mm)	Tooth shape Z (PCS)	A	
				14002... Ident. No.	●
20	0.2	5	80	005	●
20	0.3	5	64	060	●
20	0.4	5	64	095	●
20	0.5	5	48	130	●
20	0.6	5	48	170	●
20	0.8	5	48	215	●
20	1	5	40	260	●
20	1.2	5	40	315	●
20	1.6	5	40	370	●
20	2	5	32	430	●
25	0.2	8	80	010	●
25	0.3	8	80	065	●
25	0.4	8	64	100	●
25	0.5	8	64	135	●
25	0.6	8	64	175	●
25	0.8	8	48	220	●
25	1	8	48	265	●
25	2	8	40	435	●
32	0.2	8	100	015	●
32	0.4	8	80	105	●
32	0.5	8	80	140	●
32	0.6	8	64	180	●
32	0.8	8	64	225	●
32	1	8	64	270	●
32	1.2	8	48	325	●
32	1.6	8	48	380	●
32	2	8	48	440	●
32	3	8	40	565	●
40	0.2	10	128	020	●
40	0.3	10	100	075	●
40	0.4	10	100	110	●
40	0.5	10	80	145	●
40	0.6	10	80	185	●
40	0.8	10	80	230	●
40	1	10	64	275	●
40	1.2	10	64	330	●
40	1.6	10	64	385	●
40	2	10	48	445	●
40	2.5	10	48	505	●
40	3	10	48	570	●
50	0.2	13	128	025	●
50	0.3	13	128	080	●
50	0.4	13	100	115	●
50	0.5	13	100	150	●
50	0.6	13	100	190	●
50	0.8	13	80	235	●
50	1	13	80	280	●
50	1.2	13	80	335	●

D (mm)	T (mm)	B (mm)	Tooth shape Z (PCS)	A	
				14002... Ident. No.	●
50	1.6	13	64	390	●
50	2	13	64	450	●
50	2.5	13	64	510	●
50	3	13	48	575	●
63	0.3	16	128	085	●
63	0.4	16	128	120	●
63	0.5	16	128	155	●
63	0.6	16	100	195	●
63	0.8	16	100	240	●
63	1	16	100	285	●
63	1.2	16	80	340	●
63	1.6	16	80	395	●
63	2	16	80	455	●
63	2.5	16	64	515	●
63	3	16	64	580	●
80	0.3	22	160	090	●
80	0.4	22	160	125	●
80	0.5	22	128	160	●
80	0.6	22	128	200	●
80	0.8	22	128	245	●
80	1	22	100	290	●
80	1.2	22	100	345	●
80	1.6	22	100	400	●
80	2	22	80	460	●
80	2.5	22	80	520	●
80	3	22	80	585	●
100	0.5	22	160	165	●
100	0.6	22	160	205	●
100	1	22	128	295	●
100	1.6	22	100	405	●
100	2	22	100	465	●
100	2.5	22	100	525	●
100	3	22	80	590	●
125	0.6	22	160	210	●
125	0.8	22	160	255	●
125	1	22	160	300	●
125	1.2	22	128	355	●
125	1.6	22	128	410	●
125	2	22	128	470	●
125	2.5	22	100	530	●
125	3	22	100	595	●
160	1	32	160	305	●
160	1.6	32	160	415	●
160	2	32	128	475	●
160	3	32	128	600	●
200	1	32	200	310	●
200	1.6	32	160	420	●
200	2	32	160	480	●

Prod. Gr. 10K

ORION HSS metal circular saw blade, coarse-toothed, type B (DIN 1838)
Up to 1000 N/mm² large cross sections and cutting depths, on CNC machines



Application:

For creating saw cuts in large cross sections and for medium to large cutting depths in the material groups of steel, (stainless steel), cast iron and (non-ferrous metals) up to a strength of 1000 N/mm².

- top-quality cutting material for extremely demanding requirements in terms of service life
- universal use for a multitude of applications

Execution:

- precision-ground metal circular saw blade with tooth type B, coarse serrated, laterally hollow ground and hole without keyway

Technical data:

- Tolerance of cutting edge diameter: js15
- Tolerance of cutting edge thickness: js11
- Tolerance of hole diameter: H7

Advantage:

- innovative cutting geometry with large chip space ensures chip removal and universal application



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
14004	45	35	20	10	10	230	300	120	100	70	80	60		35					

D (mm)	T (mm)	B (mm)	Tooth shape Z (PCS)	B	
				14004... Ident. No.	
50	0.5	13	48	150	●
50	0.6	13	48	190	●
50	0.8	13	40	235	●
50	1	13	40	280	●
50	1.2	13	40	335	●
50	1.6	13	32	390	●
50	3	13	32	575	○
63	0.5	16	64	155	●
63	0.6	16	48	195	●
63	0.8	16	48	240	●
63	1	16	48	285	●
63	1.2	16	40	340	●
63	1.6	16	40	395	●
63	2	16	40	455	●
63	3	16	32	580	●
80	0.5	22	64	160	●
80	0.6	22	64	200	●
80	0.8	22	64	245	●
80	1	22	48	290	●

D (mm)	T (mm)	B (mm)	Tooth shape Z (PCS)	B	
				14004... Ident. No.	
80	1.6	22	48	400	●
80	3	22	40	585	●
100	0.6	22	80	205	●
100	0.8	22	64	250	●
100	1	22	64	295	●
100	1.2	22	64	350	●
100	1.6	22	48	405	●
100	2	22	48	465	●
100	2.5	22	48	525	●
100	3	22	40	590	●
125	1	22	80	300	●
125	1.2	22	64	355	●
125	1.6	22	64	410	●
125	2	22	64	470	●
125	2.5	22	48	530	●
160	1	32	80	305	●
160	1.6	32	80	415	●
160	2.5	32	64	535	○
160	3	32	64	600	●

Prod. Gr. 1QK

ORION HSS metal circular saw blade, coarse-toothed with taper tap and third tap, type C (DIN 1838)
Up to 1000 N/mm² large cross sections and cutting depths



Application:

For creating separation cuts in medium to large cutting depths in the material groups of steel, (stainless steel), cast iron and (non-ferrous metals) up to a strength of 1000 N/mm².

- top-quality cutting material for extremely demanding requirements in terms of service life
- universal use for a multitude of applications

Execution:

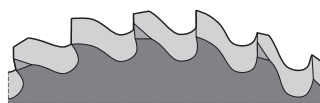
- precision-ground metal circular saw blade with tooth type B, coarse serrated with taper tap and third tap, laterally hollow-ground, hole without keyway

Technical data:

- Tolerance of cutting edge diameter: js15
- Tolerance of cutting edge thickness: js11
- Tolerance of hole diameter: H7

Advantage:

- innovative cutting geometry with large chip space plus taper tap and third tap ensures cutting distribution and increases cutting performance





Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
14008	45	35	20	10	10	230	300	120	100	70	80	60								

D (mm)	T (mm)	B (mm)	Tooth shape		C		D (mm)	T (mm)	B (mm)	Tooth shape		C	
			Z (PCS)	14008... Ident. No.	Z (PCS)	14008... Ident. No.							
50	2	13	32	450	●	100	1.2	22	64	350	●		
50	2.5	13	32	510	○	100	1.6	22	48	405	●		
63	1	16	48	285	●	100	2	22	48	465	●		
63	1.6	16	40	395	●	100	3	22	40	590	●		
63	2	16	40	455	●	125	1.2	22	64	355	●		
63	2.5	16	32	515	●	125	1.6	22	64	410	●		
63	3	16	32	580	○	125	2	22	64	470	●		
80	1	22	48	290	●	125	3	22	48	595	●		
80	1.2	22	48	345	●	160	2	32	64	475	●		
80	1.6	22	48	400	●	160	3	32	64	600	●		
80	2	22	40	460	●	200	2	32	80	480	●		
80	3	22	40	585	●	200	2.5	32	80	540	●		
100	1	22	64	295	●	200	3	32	64	605	●		

Prod. Gr. 10K

ORION Metal circular saw blades with secondary pinholes HSS/HSSE



For cutting on sawing machines



Application:

Ident. No. 050, 080, 110, 230, 290, 310: For creating saw cuts on low-speed machines such as Eisele, Trennjäger and other brands.

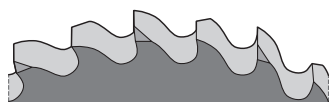
Ident. No. 060-070, 090, 120, 240-250, 300, 410-510: for creating saw cuts on low-speed machines such as Eisele, Trennjäger and other brands.

Execution:

precision-ground metal circular saw blade with Bw tooth type (curved tooth = alternate bevel) and C tooth type (with taper tap and third tap)

Advantage:

- innovative cutting geometry for cutting solid material with high cutting depths
- steam-treated protects against metal welding
- Ident. No. 050, 080, 110, 230, 290, 310-410, 430-510:** short narrow swarf is created
- Ident. No. 060-070, 090, 120, 240-250, 300, 420:** cut distribution enables high cutting performance



Ident. No. 050-410, 430-510



Ident. No. 420



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
14015 HSSE BW	45	35	20	20	18	230	300	45	45	40	40	60								

Cutting edge Ø (mm)	Bore Ø (mm)	Thickness of cutting edge (mm)	Teeth spacing (mm)	Tooth shape	Side holes	Cutting material Z	HSS		HSSE Co5	
							14015... Ident. No.	14015... Ident. No.	14015... Ident. No.	14015... Ident. No.
225	32	2	4	BW	2/8/45 2/9/50 2/11/63	180	050	●	-	-
225	32	2	6	C	2/8/45 2/9/50 2/11/63	120	060	●	-	-
225	32	2	8	C	2/8/45 2/9/50 2/11/63	90	070	●	-	-
225	40	2	4	BW	2/8/55 4/12/64	180	080	●	-	-
225	40	2	6	C	2/8/55 4/12/64	120	090	●	-	-
250	40	2	4	BW	2/8/55 4/12/64	200	110	●	410	●
250	40	2	6	C	2/8/55 4/12/64	128	120	●	420	●
315	40	3	4	BW	2/8/55 4/12/64	220	230	●	430	●
315	40	3	6	C	2/8/55 4/12/64	160	240	●	440	●
315	40	3	8	C	2/8/55 4/12/64	120	250	●	450	●
350	40	3	5	BW	2/8/55 4/12/64	220	290	●	490	●
350	40	3	9	C	2/8/55 4/12/64	120	300	●	500	●
350	40	3	4	BW	2/8/55 4/12/64	280	310	●	510	●

Prod. Gr. 10K



ORION® Mount for metal circular saws

Application:

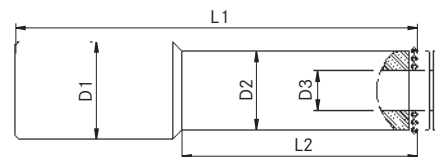
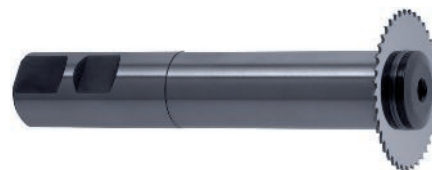
For holding metal circular saw blades 14002-14008 and 16385.

Advantage:

- top-quality substrate with high-quality finish for precise work

Execution:

- precision-engineered clamp HSSE with 64 HRC, concentricity tolerance = 0.01 mm, straight shank and clamping surface as per DIN 1835 B



Suitable for sawblade Ø (mm)	L1 (mm)	L2 (mm)	D2 (mm)	D3 (mm)	D1 (mm)	Mount for metal circular saws		Clamping screw for metal circular saw clamp		Clamping disc for metal circular saw clamp		Clamp set for metal circular saws	
						14010... Ident. No.	●	14010... Ident. No.	●	14010... Ident. No.	●	14010... Ident. No.	●
20	90	30	10	5	20	022	●	122	●	222	●	900	●
25	100	42	13	8	20	027	●	127	●	227	●	900	●
32	105	53	16	8	20	034	●	134	●	234	●	900	●
40	110	60	20	10	20	042	●	142	●	242	●	900	●
50	136	77	24.5	13	25	052	●	152	●	252	●	900	●
63	136	77	24.5	16	25	065	●	165	●	265	●	900	●

Prod. Gr. 1QK

ORION® Mounting set for metal circular saws

Application:

For holding metal circular saw blades 14002-14008 and 16385.

straight shank and clamping surface as per DIN 1835, available for saw blade clamp diameters of 20/25/32/40/50/63, clamping screws and clamping discs

Execution:

- precision-engineered clamp set HSSE with 64 HRC, concentricity tolerance = 0.01 mm,

Advantage:

- top-quality substrate with high-quality finish for precise work



14010...	Ident. No.	900
		●

Prod. Gr. 1QK

ARE YOU LOOKING FOR PRODUCTS THAT MEET THE TOUGHEST DEMANDS? WE HAVE WHAT IT TAKES.

For a complete range of products that meet the toughest demands, visit www.iconridge.com



Cutting materials for bandsaw blades

Three cutting materials are available for cutting components with bandsaw blades. A distinction is made between the following cutting materials:

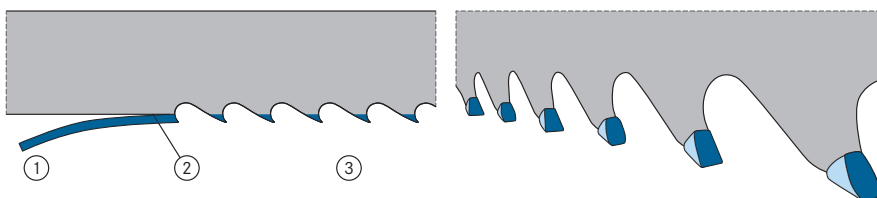
Tool steel bandsaws

Tool steel bandsaws are made from a single piece of carbon steel and are sufficient for numerous applications with low requirements on service life and the material to be processed. A distinction is made between two variants: Either the backing and toothed wheel are hardened or the backing is soft and the tips of the teeth are hardened.

Bi-metal bandsaws (M42)

Bi-metal bandsaws are made of a flexible band backing (spring steel) with hardened tooth tips (HSS) welded onto the spring steel via an electron beam process. The majority of bandsaw blades are produced through this manufacturing process. Higher cutting speeds can be achieved compared to tool steel bandsaws. The high degree of hardness facilitates the processing of materials that are challenging or difficult to machine. Bi-metal bandsaws (M42) can be used on all machines and for all machine conditions.

- ① Extremely hard blade made from high-speed steel
- ② Welding of spring steel with HSS through electron welding process
- ③ Precision-milled teeth



Carbide-tipped bandsaws (VHM)

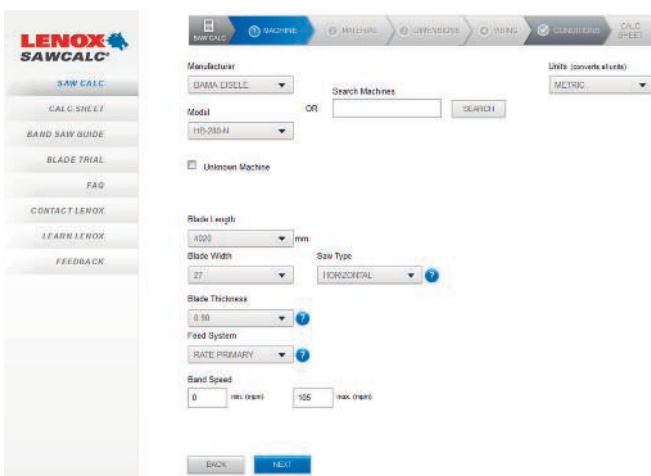
The teeth are milled/ground into a band backing (carrier material), which consists of a high-strength spring steel alloy. Using a patented welding process, the cemented carbide is attached to the teeth. The tips are ground in on the side, the front and top edge in order to produce the tooth shape. Using carbide-tipped bandsaws, the highest cutting speeds can be used and the widest range of materials catered to. When selecting carbide-tipped bandsaws, the machine must be checked for proper suitability. The machine must have a high degree of stability (minimal vibration) and must have free movement. Excessive vibration or impacts destroy the cemented carbide and cause fractures.



Determining the length of a bandsaw blade

The length of the bandsaw blade depends on the machine. Each machine type has its own specific band length. Even slight deviations may produce undesirable results. Please check with the manufacturer of your sawing machine to determine your band length.

Alternatively, you can determine the band length by manufacturer:
<http://www.sawcalc.com/>





Selecting the bandsaw type

The following selection chart shows all possible types of bandsaw in the different cutting materials and their application. Select a bandsaw type which suits your application:

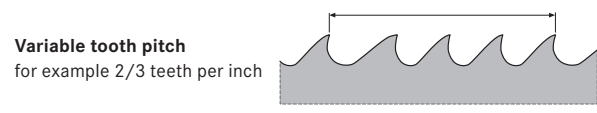
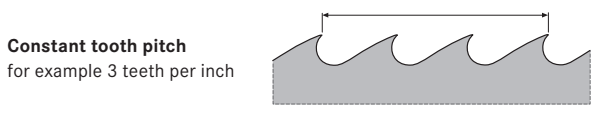
Bi-metal machining types	Types	P	P	P	M	K	N	S	H
		<700 N/mm ²	<1000 N/mm ²	<1300 N/mm ²	<1100 N/mm ²	310 N/mm ²	<1000 N/mm ²	<1400 N/mm ²	55-63 N/mm ²
Universal									
	CLASSIC PRO	●	●	○	○	●	●		
	ATORN type UN	●	●	○	○	●	●		
	CLASSIC	●	●	○	○	●	●		
	DIEMASTER 2	●	●	○	○	●	●		
Full cut									
	CONTESTOR GT	○	●	●	●	○	○	●	
	CONTESTOR XL	○	●	●	●	○	○	●	
	QXP	●	●	●	●	●	●	○	
	CLASSIC PRO	●	●	○	○	●	●		





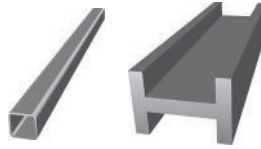
Profiles and bundles									
	ARMOR Rx	●	●						
	Rx+	●							
	CLASSIC PRO	●	●	○	○	●	●		
Cemented carbide machining types									
	Types	P	P	P	M	K	N	S	H
		<700 N/mm ²	<1000 N/mm ²	<1300 N/mm ²	<1100 N/mm ²	310 N/mm ²	<1000 N/mm ²	<1400 N/mm ²	55-63 N/mm ²
Full cut									
	ARMOR CT Black	●	●	●	●	●	●	○	○
	MAX CT	●	●	●	●	●	●	●	○
	TRI-TECH CT	○	●	●	●	●	○	●	○
	VERSA PRO	●	●	●	●	●	●	●	○
	TRI_MASTER	●	●	●	○	●	●	○	○
	CAST MASTER						●		
	CAST MASTER XL						●		
	HRC								●
	MASTER-GRIT								●

Tooth pitch variants

The contact length of the saw band in the workpiece is relevant to the selection of tooth pitch. A distinction is made between:



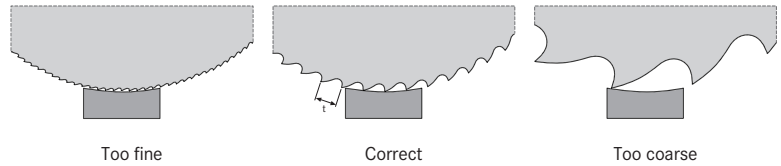
Selection of the number of teeth

Square material	Teeth per inch	in mm	Round material	Teeth per inch	Ø in mm	Tubes and sections	Teeth per inch	Wall thicknesses in mm
	14/18	5		14/18	5-6		14/18	1-2
	10/14	5-8		10/14	6-10		10/14	2-3
	8/12	8-12		8/12	10-15		8/12	3-4
	6/10	12-16		6/10	15-20		6/10	4-5
	5/8	16-25		5/8	20-30		5/8	5-7
	4/6	25-50		4/6	30-75		4/6	7-15
	3/4	50-100		3/4	75-150		3/4	15-28
	2/3	100-150		2/3	150-250		2/3	28-50
	1.4/2.0	150-380		1.4/2.0	250-480		1.4/2.0	
	1.0/1.3	380-800		1.0/1.3	480-900		1.0/1.3	
0.7/1.0	800-1200	0.7/1.0	900-1200	0.7/1.0				



Work regulations for metal circular saw blades

- Use the correct tooth shape and tooth pitch for the different materials and applications.
- For pipe diameters and contact lengths smaller than 50 mm, use tooth shape A (finely toothed).
- Saw blades must be sawn-in due to the sharpness of the teeth. When doing so, the cutting speed must be reduced by up to 50% until the teeth have lost their initial sharpness.
- Use coolants to avoid overheating and ensure chips are removed.
- Clamp the material at as short a distance as possible to avoid vibrations.
- The cutting speed and feed rate must be adjusted to match the material and geometry (see cutting value table).



Guide to eliminating faults with metal saw blades

Wear on teeth

- Larger tooth pitch if the saw blade clogs with chips
- Improve coolant feed or use correct coolant

Teeth break off

- Improve poor chip removal
- Use appropriate tooth pitch
- Optimise workpiece clamping

Tool breakage

- Re-sharpen tool
- Reduce cutting speed

Clogging and material adhesion to saw blade

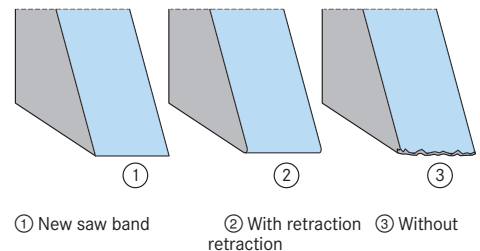
- Optimise feed
- Optimise saw blade shape
- Coolant optimisation



Retraction of bandsaw blades

A new saw band has very sharp tooth tips due to the manufacturing method. In order to withstand the cutting pressure when band sawing, the tooth tips should be circularly ground. Without this fine grinding step, the high cutting pressure will lead to microscopic damage to the tooth tips and consequently to a shorter service life of the entire saw band. Saw blades should be retracted to significantly increase the service life. The following steps describe proper retraction:

- The correct band speed must be used for the material to be cut.
- Reduction of the feed speed or feed power of the saw to reach a cutting speed of 20% to 50% of the normal cutting speed. Mild steels require a greater reduction in velocity than materials that are more difficult to machine.
- The first cut should be initiated at reduced speed with care taken to ensure the teeth form a shaving. As soon as the blade is fully submerged in the workpiece, the feed can be increased slightly.
- The feed speed should be successively increased across several cuts until the normal cutting speed is reached (total cutting area 60 to 118 inch²/150 to 300 cm²)



It is important to note that slight adjustments must be made to the band speed during insertion in the case of excessive noise or vibration. As soon as the saw blade has been retracted, the recommended band speed should be used.



Rules for working with metal circular saws

- Where contact length is less than 50 mm or in the case of thin-walled pipes and profiles, only tooth pitches with 0° chip angle may be used.
- The lifespan of a saw blade depends on controlled sawing-in: Reduce cutting pressure (feed) by 50% for the first cuts, then increase feed to the optimal value after approx. 300 cm surface has been cut.
- As a general rule, the cutting speed is determined by the strength, type and cross-section of the sawn material. The higher the strength, the lower the speed that must be selected. A higher speed can be used with smaller cross sections than with larger cross sections. The chip shape indicates whether the speed and feed rate are selected correctly. The chips should be loosely coiled. If the chips are thin, the feed should be increased; thick chips are a sign of the speed being too high.
- The material should be clamped in order to help the saw blade work with as little vibration as possible.
- Use of coolant prevents overheating and aids faster chip removal.
- Use of the highest permitted band width for the machine ensures sufficient stability at higher feed forces. When cutting curves, the blade width depends on the smallest radius which is to be cut (see cutting value table).

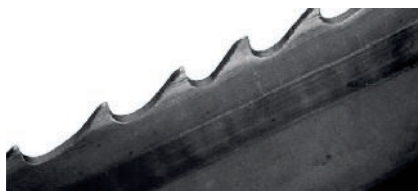
Radius (mm)	3	8	15	30	38	65	100	140
Band width (mm)	3	5	6	8	10	13	16	20



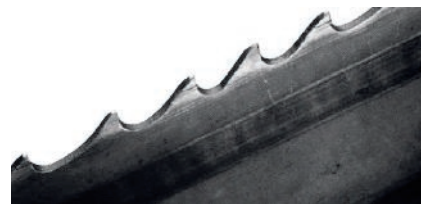
Troubleshooting guidelines for bandsaw blades

**Wear on teeth**

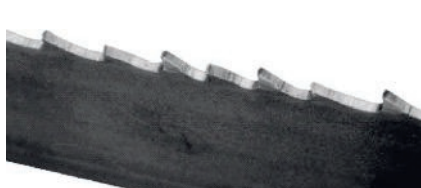
- Larger tooth pitch in the case that saw blade clogs with chips
- Improve coolant supply or use correct coolant
- Change band or feed speed
- Saw blade was not retracted

**Wear on both sides of the teeth**

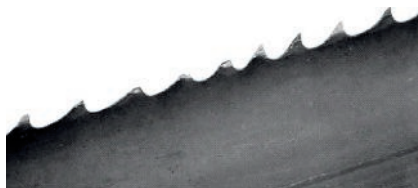
- Check side guide and, if necessary, adjust band width

**Wear on one side of the teeth**

- Drive wheels
- Side guides

**Discoloured tooth tips due to excessive frictional heat**

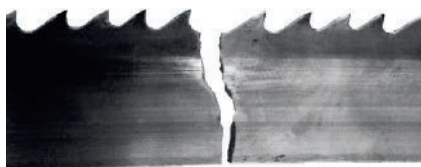
- Improve coolant supply or use correct coolant
- Change band or feed speed

**Teeth breaking away**

- Improve chip clearance
- Use appropriate tooth pitch
- Optimise workpiece clamping

**Chips welded on tooth tips (cold welding)**

- Improve coolant supply or use correct coolant
- Change band or feed speed
- Chip brush - improve chip clearance

**Breakage of carrier material or cracks originating from tooth spaces**

- Change feed speed
- Adjust pre-clamping/band clamping

**Breakage of carrier material or cracks originating from band backing**

- Change feed speed
- Reserve guide/band guide
- Adjust pre-clamping/band clamping

**Breakage of welding seam**

- Change feed speed
- Reserve/band/side guide
- Adjust pre-clamping/belt clamping

**Jamming and material adhesion on the saw blade**

- Optimization of the feed
- Optimization of the saw blade form
- Coolant optimization

**Used belt is "short" on the cutting edge**

- Change feed speed
- Drive wheels
- Side guides

**Broken belt exhibits distortion over the belt length**

- Change feed speed
- Side/reserve and band guide
- Adjust pre-clamping/band clamping
- Drive wheels

Tool break

- Re-sharpen tool
- Reduce cutting speed



formula collection

formulas

abbreviation	description	unit	formulas
N	revolutions per min	rpm	$n = \frac{v_c \cdot 1000}{\pi \cdot d}$
v_c	cutting speed	m/min	$v_c = \frac{d \cdot \pi \cdot n}{1000}$
v_f	feed per min	mm	$v_f = n \cdot z \cdot f_z$
f_z	feed per tooth	mm	$f_z = \frac{v_f}{n \cdot z}$
f	feed per revolution	mm	$f = \frac{v_f}{n}$
Q	material removal rate	cm ³ /min	$Q = \frac{a_p \cdot a_e \cdot v_f}{1000}$
t_h	main period	min	$t_h = \frac{L \cdot i}{v_f}$
h_m	central clamping thickness	mm	$h_m = f_z \cdot \sqrt{\frac{a_e}{d}}$
R_{th}	roughness depth	mm	$R_{th} = \frac{d}{2} \cdot \sqrt{\frac{d^2 - b_r^2}{4}}$
b_r	line feed	mm	$b_r = 2 \cdot \sqrt{R_{th}(d - R_{th})}$

explanation of terms

ae	cutting width	mm
ap	cutting depth	mm
d	tool diameter	mm
L	total cutting path	mm
i	number of cuts	
z	number of cutting edges	



effective diameter for milling tools with radius

In order to make optimal use of our tools, it is particularly important to determine speed correctly. This is based on the effective tool diameter. For cutting depths $a_p < 0.5 \times D$, the effective diameter which is actually in contact must be used for the calculation. For increased service life, we recommend processing with tilted spindle. The angle of attack must be taken into account in the calculation.

example:

with a ball cutter of diameter 6 mm, an infeed of a_p of 0.1 mm, no working angle, an effective diameter of 1.54 mm results. To achieve a cutting speed of $V_c = 200$ m/min, a rotation speed of $n = 41,300$ rpm is needed, not 10,616 rpm ($\varnothing 6$ mm).

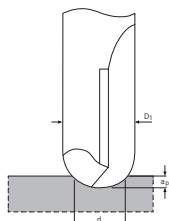
$$d = 2 \cdot \sqrt{a_p(D_1 - a_p)}$$

$$d = 2 \cdot \sqrt{0,1(6 - 0,1)}$$

$$d = 1,54 \text{ mm}$$

radius cutter

no working angle

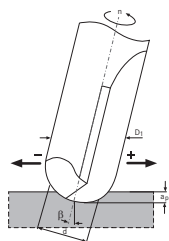


$$d = 2 \cdot \sqrt{a_p(D_1 - a_p)}$$

a_p = axial infeed
 D_1 = cutter diameter
 d = effective diameter

Ø	radius	cutting depth (a_p) in mm												
		0,05	0,1	0,15	0,2	0,25	0,3	0,5	1	1,5	2	2,5	3	
0.3	0,15	0,224	0,283	0,3	0,283	0,224								
0.4	0,2	0,265	0,346	0,387	0,4	0,387	0,346							
0.5	0,25	0,3	0,4	0,458	0,49	0,5	0,49							
0.6	0,3	0,332	0,447	0,52	0,566	0,592	0,6							
0.8	0,4	0,387	0,529	0,624	0,693	0,742	0,775							
1	0,5	0,436	0,6	0,714	0,8	0,866	0,917							
1.5	0,75	0,539	0,748	0,9	1,02	1,118	1,2							
2	1	0,624	0,872	1,054	1,2	1,323	1,428	1,732						
2.5	1,25	0,7	0,98	1,187	1,356	1,5	1,625	2	2,449					
3	1,5	0,768	1,077	1,308	1,497	1,658	1,8	2,236	2,8828	3				
4	2	0,889	1,249	1,52	1,744	1,936	2,107	2,646	3,464	3,873	4			
5	2,5	0,995	1,4	1,706	1,96	2,179	2,375	3	4	4,583	4,899	5		
6	3	1,091	1,536	1,873	2,154	2,398	2,615	3,317	4,472	5,196	5,657	5,916		
7	3,5	1,179	1,661	2,027	2,332	2,598	2,835	3,606	4,899	5,745	6,325	6,708		
8	4	1,261	1,778	2,17	2,498	2,784	3,04	3,873	5,292	6,245	6,928	7,416		
9	4,5	1,338	1,887	2,304	2,653	2,958	3,231	4,123	5,657	6,708	7,483	8,062		
10	5	1,411	1,99	2,431	2,8	3,122	3,412	4,359	6	7,141	8	8,66		
11	5,5	1,48	2,088	2,551	2,939	3,279	3,583	4,583	6,325	7,55	8,485	9,22		
12	6	1,546	2,182	2,666	3,072	3,428	3,747	4,796	6,633	7,937	8,944	9,747		
14	7	-	2,358	-	3,323	3,708	4,055	5,196	7,211	8,66	9,798	10,724	11,489	
16	8	-	2,522	-	3,555	3,969	4,341	5,568	7,746	9,327	10,583	11,619	12,49	
20	10	-	2,821	-	3,98	4,444	4,862	6,245	8,718	10,536	12	13,229	14,283	
25	12,5	-	3,156	-	4,454	4,975	5,444	7	9,798	11,874	13,565	15	16,248	
30	15	-	3,458	-	4,883	5,454	5,97	7,681	10,77	13,077	14,967	16,583	18	
32	18	-	3,572	-	5,044	5,635	6,168	7,937	11,136	13,528	15,492	17,176	18,655	
40	20	-	3,995	-	5,643	6,305	6,902	8,888	12,49	15,199	17,436	19,365	21,071	

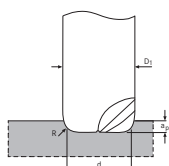
with angle of attack



$$d = D_1 \cdot \sin \left[\beta \pm \arccos \left(\frac{D_1 - 2a_p}{D_1} \right) \right]$$

a_p = axial infeed
 D_1 = cutter diameter
 d = effective diameter
 β = angle of attack

torus milling cutter



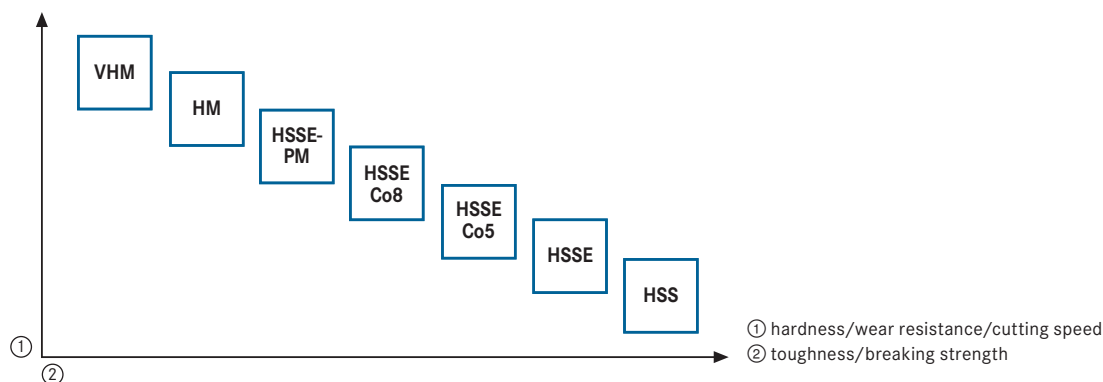
$$d = D - 2R + 2\sqrt{a_p(2R - a_p)}$$

a_p = axial infeed
 D = cutter diameter
 d = effective diameter
 R = corner radius



milling tool cutting materials

the cutting materials are those which form the cutting part of a metal cutting tool. cutting materials significantly influence the profitability and process reliability of machining processes. there will be a cutting material particularly suited to nearly every application. the following breakdown shows the most common cutting materials for milling, depending on the application:



VHM

SC – solid carbide

solid carbides are sintered materials and these are usually manufactured from 88–94 % tungsten carbide (WC) and 6–12 % cobalt. carbides are less tough than high-speed steels (HSS/E)

- cutting material for applications up to 70 HRC
- high wear resistance, heat resistance and hardness
- excellent temperature resistance, thus higher cutting speeds

HM

HM – cemented carbide tipped

cutting plates are made of cemented carbide on a basic body made of high speed steel. this combines the bending strength of HSS with wear resistance of solid carbide.

- higher elasticity like solid carbide
- high cutting speed
- for wear properties, see solid carbide

HSSE-
PM

HSSE PM – powder metal

these are sintered high-speed steels. they combine the advantages of HSSE and solid carbide. increased fracture and fatigue strength through evenly distributed carbides, no metallurgical defects. the hardness of PM lies between 64 and 67 HRC.

- problem solver for e. g. vibration
- medium to high cutting speeds are possible
- high elasticity and cutting speed

HSSE
Co5

HSSE/CO5/CO8 - high-speed steel cobalt content approx. 5 % or 8 %

high-speed steel with a cobalt content of approx. 5–8 %. HSSE allows higher processing temperatures than HSS, increased cutting speeds are possible. the hardness of HSS-E is between 64–66 HRC (CO5) and 65–67 HRC (CO8).

- very high elasticity
- low to medium cutting speeds
- rising heat and wear resistance with increasing cobalt content

HSS

HSS – high-speed steel

high-speed steel excels through being widely available and versatile in application. compared to cemented carbide, HSS has a lower hardness (62–64 HRC), but higher bending strength.

- lower cutting speed compared to cemented carbide
- lower wear resistance compared to cemented carbide
- lower hot and bending strength
- cooling required



high-performance coatings for milling tools

coatings act as an insulation, they form a protective layer between the workpiece and the milling tool. they protect the cemented carbide against e. g. heat or abrasive wear. the hard layer increases the surface hardness of the tool, for example, and significantly reduces the friction coefficient compared to uncoated cemented carbide. other properties may be:

- higher heat resistance
- higher cutting speeds and feed rates
- higher capability for dry machining
- longer service life

titanium aluminium nitride

universal, particularly thermally and chemically stable layer for high-performance machining with high cutting speed.

- Vickers hardness: 3200 HV
- friction coefficient of steel: 0.55
- temperature resistance: 700–800 °C
- colour: dark blue grey
- layer structure: monolayer
- coating process: PVD

TiAlN



aluminium titanium nitride

high-performance hard material layers with high aluminium content and exceptional properties such as temperature resistance and hardness.

- Vickers hardness: 3600 HV
- friction coefficient of steel: 0.5
- temperature resistance: 850–950 °C
- colour: dark blue grey
- layer structure: multi-layer
- coating process: PVD

AlTiN



titanium carbon nitride

the high level of hardness and wear resistance exhibited by the TiCN layer mean it is used for materials which are difficult to machine.

- Vickers hardness: 3500 HV
- friction coefficient of steel: 0.2
- temperature resistance: 400 °C
- colour: blue grey (anthracite)
- layer structure: multi-layer
- coating process: PVD

TiCN



titanium silicon nitride

special high-performance coating, particularly suitable for hard machining up to 68 HRC. also good for steel processing.

- Vickers hardness: 3800 HV
- friction coefficient of steel: 0.4
- temperature resistance: 1100–1300 °C
- colour: blue grey
- layer structure: multi-layer
- coating process: PVD

TiSiN



zirconium carbonitride

titanium-free special coating for milling non-ferrous metals up to 12 % silicone. reduced tendency towards built-up edge.

- Vickers hardness: 2500 HV
- friction coefficient of steel: 0.4
- temperature resistance: 600 °C
- colour: bright yellow-gold
- layer structure: multi-layer
- coating process: PVD

CALIDA Z



ULTRA

universal, extremely hard and temperature-resistant TiAlN-based layer. dry processing and high feed rates possible.

- Vickers hardness: 3800 HV
- friction coefficient of steel: 0.6
- temperature resistance: 1100 °C
- colour: aubergine
- layer structure: multi-layer
- coating process: PVD

ULTRA



ULTRA N (non-ferrous metals)

special ZrCN-based coating for high-performance processing of non-ferrous metals. low-friction and wear-resistant.

- Vickers hardness: 3100 HV
- friction coefficient of steel: 0.5
- temperature resistance: 600 °C
- colour: dark yellow-gold
- layer structure: multi-layer
- coating process: PVD

ULTRA N



ULTRA-DC (diamond coated)

diamond coating for machining graphite. excels through extreme hardness and abrasion resistance as well as high chemical resistance.

- Vickers hardness: 10000 HV
- friction coefficient of steel: 0.2
- temperature resistance: 600 °C
- colour: grey
- layer structure: multi-layer
- coating process: CVD

ULTRA DC



ULTRA-M (stainless steel)

special multi-layer material on TiAlN/AlCrN base for high-performance machining of highly heat-resistant and high-alloy materials.

- Vickers hardness: 3200 HV
- friction coefficient of steel: 0.35
- temperature resistance: 1100 °C
- colour: bright grey
- layer structure: multi-layer
- coating process: PVD

ULTRA M



ULTRA-MS (stainless steel/special alloys)

extremely hard and temperature-resistant coating on AlCrN base for machining difficult-to-machine materials.

- Vickers hardness: 3200 HV
- friction coefficient of steel: 0.35
- temperature resistance: 1100 °C
- colour: blue grey
- layer structure: monolayer
- coating process: PVD

ULTRA MS





Clamping device recommendation for solid carbide milling



	Standard collet chuck	precision collet chuck	Shrink-fit chucks	Hydro expansion chuck	Surface chuck	Power chucks
Holding torques	○	●	●	●	●	●
concentricity	●	●	●	●	○	●
Vibration-reducing	●	●	○	●	○	●
Speed/balancing quality	●	●	●	●	○	●
internal cooling	Yes	Yes	Yes	Yes	Yes	Yes
Temperature resistance	●	●	●	○	●	●
Overall rating	Well suited	Well suited	Highly suitable	Highly suitable	Well suited	Highly suitable

● = very well suited

● = suitable

○ = limited suitability



milling troubleshooting

problem/error	solution/measure
poor surface quality	<ul style="list-style-type: none"> ▪ reduce feed rate ▪ reduce cutting depth ▪ increase cutting speed ▪ optimise tool and workpiece clamping ▪ increase number of teeth
vibration/chatter	<ul style="list-style-type: none"> ▪ reduce cutting speed ▪ synchronous milling ▪ optimise coolant feed ▪ reduce cutting depth ▪ optimise tool and workpiece clamping
chip jamming	<ul style="list-style-type: none"> ▪ reduce feed rate ▪ reduce cutting depth ▪ reduce number of teeth ▪ optimise coolant feed
cutting edge breakout	<ul style="list-style-type: none"> ▪ reduce feed rate ▪ increase cutting speed ▪ optimise tool and workpiece clamping
cutting edge wear	<ul style="list-style-type: none"> ▪ increase feed rate ▪ reduce cutting speed
built-up edges	<ul style="list-style-type: none"> ▪ increase feed ▪ increase cutting speed ▪ optimise coolant feed ▪ reduce cutting depth
millor breakage	<ul style="list-style-type: none"> ▪ reduce feed rate ▪ reduce cutting depth ▪ increase cutting speed ▪ optimise tool and workpiece clamping






hardness comparison table according to DIN 50150

conversion between hardness values is fundamentally inaccurate. therefore, a conversion should be carried out only if the prescribed test procedure cannot be applied.

the conversion table is only valid for unalloyed, low-alloy steels and cast steel in hot-formed, heat-treated condition. for high-alloy steels and strain-hardened steels, deviations are to be expected.

tensile strength R _m N/mm ²	Vickers hardness HV	Brinell hardness HB	Rockwell hardness HRC
255	80	76	
270	85	80,7	
285	90	85,5	
305	95	90,2	
320	100	95	
335	105	99,8	
350	110	105	
370	115	109	
385	120	114	
400	125	119	
415	130	124	
430	135	128	
450	140	133	
465	145	138	
480	150	143	
495	155	147	
510	160	152	
530	165	156	
545	170	162	
560	175	166	
575	180	171	
595	185	176	
610	190	181	
625	195	185	
640	200	190	
660	205	195	
675	210	199	
690	215	204	
705	220	209	
720	225	214	
740	230	219	
755	235	223	
770	240	228	20,3
785	245	233	21,3
800	250	238	22,2
820	255	242	23,1
835	260	247	24
850	265	252	24,8
865	270	257	25,6
880	275	261	26,4
900	280	266	27,1
915	285	271	27,8
930	290	276	28,5
950	295	280	29,2
965	300	285	29,8
995	310	295	31
1030	320	304	32,2
1060	330	314	33,3
1095	340	323	34,4

tensile strength R _m N/mm ²	Vickers hardness HV	Brinell hardness HB	Rockwell hardness HRC
1125	350	333	35,5
1155	360	342	36,6
1190	370	352	37,7
1220	380	361	38,8
1255	390	371	39,8
1290	400	380	40,8
1320	410	390	41,8
1350	420	399	42,7
1385	430	409	43,6
1420	440	418	44,5
1455	450	428	45,3
1485	460	437	46,1
1520	470	447	46,9
1555	480	-456	47,7
1595	490	-466	48,4
1630	500	-475	49,1
1665	510	-485	49,8
1700	520	-494	50,5
1740	530	-504	51,1
1775	540	-513	51,7
1810	550	-523	52,3
1845	560	-532	53
1880	570	-542	53,6
1920	580	-551	54,1
1955	590	-561	54,7
1995	600	-570	55,2
2030	610	-580	55,7
2070	620	-589	56,3
2105	630	-599	56,8
2145	640	-608	57,3
2180	650	-618	57,8
	660		58,3
	670		58,8
	680		59,2
	690		59,7
	700		60,1
	720		61
	740		61,8
	760		62,5
	780		63,3
	800		64
	820		64,7
	840		65,3
	860		65,9
	880		66,4
	900		67
	920		67,5
	940		68

Vickers hardness	HV		with diamond pyramid	diamond pyramid 136°, test force F ≥ 98 N
Brinell hardness calculated with: HB = 0.95 x HV	HB		with steel ball	0.102 x F/D ² = 30 N/mm ² F = test forces in N, D = taper diameter in mm
Rockwell hardness C	HRC		with diamond cone	diamond cone 120°, total test force 1471 ± 9 N



Solid carbide profiling and special cutter

		Cutting material	Type	Surface	P	M	N	K	S	H	
16564	Solid carbide graver Pre-profiled	VHM			●	○	●	●	○		
16521	Cemented carbide keyway cutter	Carbide	N		●	○	○	●	○		
16525	Cemented carbide T-groove cutter	Carbide	N		●	○	○	●	○		
16530	Cemented carbide angular milling cutter	Carbide			●	○	○	●	○		
16711	Solid carbide quarter circle milling cutter Concave	VHM	N		●	●	●	●	○		
16711	Solid carbide quarter circle milling cutter Concave	VHM	N	TiAlN	●	●	●	●	○		
16704	Solid carbide chamfer cutter 2 cutting edges, uncoated	VHM	N		●	●	●	●	○		
16705	Solid carbide chamfer cutter 2 cutting edges, uncoated	VHM	N		●	●	●	●	○		
16706	Solid carbide chamfer cutter 2 cutting edges, uncoated	VHM	N		●	●	●	●	○		










universal machining – 2 cutters

	Z	Type	Surface	Tool holding device	P	M	N	K	S	H	
16733	2	W	TiAlN	HB		●	●				
16727	2	N		HB	●	●	●	●	○		
16728	2	N	ULTRA	HB	●	●	●	●	○		
16717	2	N	TiAlN	HB	●	●	●	●	○		
16713	2	N		HA	●	●	●	●	○		
16725	2	N		HA	●	●	●	●	○		
16750	2	N		HA parallel shank	●	●	●	●	○		









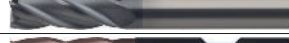





universal machining – 3 cutters

	Z	Type	Surface	Tool holding device	P	M	N	K	S	H	
16760	3	N		HB	●	●	●	●	○		
16763	3	N	ULTRA	HB	●	●	●	●	○		
16770	3	W		HB	●	●	●	○	○		
16771	3	W	ULTRA	HB	●	●	●	○	○		
16787	3	N		HB	●	●	○	●	○		
16788	3	N	ULTRA	HB	●	●	○	●	○		
16778	3	N	TiAlN	HB	●	●	○	●	●		
16781	3	N	TiAlN	HB	●	●	●	●	○		
16784	3	N	TiAlN	HA	●	●	●	●	○		

	Z	Type	Surface	Tool holding device	P	M	N	K	S	H	
16780	3	N		HA	●	●	●	●	○		
16790	3	N		HB	●	●	●	●	○		
16792	3	N	ULTRA	HB	●	●	●	●	○		
16793	3	N		HB	●	●	●	●	○		
16794	3	N	ULTRA	HB	●	●	●	●	○		
16799	3	N	TiAIN	HB	●	●	●	●	○		
16785	3	N		HA	●	●	●	●	○		








universal machining – 4 cutters

	Z	Type	Surface	Tool holding device	P	M	N	K	S	H	
16828	4	W	TiAIN	HB		●	●		○		
16830	4	N		HA	●	●	●	●	○		
16822	4	N	TiAIN	HA	●	●	●	●	○		
16823	4	N	TiAIN	HB	●	●	●	●	○		
16850	4	N		HB	●	●	●	●	○		
16837	4	H	TiAIN	HB	●			●		●	
16838	4	H	TiAIN	HB	●			●		●	
16857	4	N	ULTRA	HB	●	●	●	●	○		
16862	4	N	ULTRA	HA	●	○			○	●	
16851	4	N	ULTRA	HB	●	●	●	●	●		
16851	4	N	ULTRA	HB	●	●	●	●	●		
16853	4	N	TiAIN	HB	●	○	●	●	○		



universal machining – 6-8 cutters

	Z	Type	Surface	Tool holding device	P	M	N	K	S	H	
16886	8	VA	ULTRA	HB	●	●	●	●	●		
16876040-200	6	N	TiAIN	HB	●	●	●	○	○		
16881040-200	6	N	TiAIN	HB	●	●	●	○	○		
16883040-200	6	H	TiAIN	HA	●			○		●	
16883051-251	8	H	TiAIN	HA	●			○		●	



universal machining – roughing cutter

	Z	Type	Surface	Tool holding device	P	M	N	K	S	H	
16848	3	NR	ULTRA	HB	●	●	●	●	●		
16848	4	NR	ULTRA	HB	●	●	●	●	●		
16847	4	NF	TiAlN	HB	●	○		●	○		
16849	4	VA	ULTRA	HA	●	○	●	●	○		
16849	6	VA	ULTRA	HB	●	○	●	●	○		
16849	4	HR	TiAlN	HB	●	○	●	●	○		
16852	3	NR	TiAlN	HB	●		●	●			
16852	3	NR	TiAlN	HB	●		●	●			



universal machining – torus milling cutter

	Z	Type	Surface	Tool holding device	P	M	N	K	S	H	
16856	4	N	ULTRA	HB	●	●	●	●	●		
16862	3	H	TiAlN	HA	●	○			○	●	



universal machining – radius cutter

	Z	Type	Surface	Tool holding device	P	M	N	K	S	H	
16738	2	N		HA	●	●	●	●	○		
16740	2	N		HB	●	○	●	●	○		
16741	2	N	TiAlN	HB	●	○	●	●	○		
16744	2	N		HB	●	○	●	●	○		
16745	2	N	ULTRA	HB	●	○	●	●	○		
16743	2	N	TiAlN	HB	●	○	●	●	○		
16749	2	N	TiAlN	HA	●	○	●	●	○		
16868	4	N	ULTRA	HB	●	●	●	●	●		
16868	4	N	ULTRA	HB	●	●	●	●	●		
16866	4	NR	ULTRA	HB	●	○	○	●			



solid carbide TVC cutter – trochoidal milling

	Z	Type	Surface	Tool holding device	P	M	N	K	S	H	
16859002-012	5	N	ULTRA	HB	●			●			
16859020-028	4	N	ULTRA	HB	●			●			
16859100-110	5	VA	ULTRA M	HB		●	●		●		
16859120-128	4	VA	ULTRA M	HB		●	●		●		
16859140-154	4	W		HB			●				
16859160-172	4	W		HB			●				



Solid carbide mills for machining aluminium

	Type	Surface	Tool holding device	P	M	N	K	S	H	
16652105-114	W		HA			●				
16700	W		HA			●				
16652010-095	W	ULTRA N	HA			●				
16652120-128	W		HB			●				
16652140-147	W	ULTRA N	HB			●				
16817	W		HB			●				
16821	WR		HB			●				
16652220-228	W		HB			●				
16652270-278	W	ULTRA N	HA			●				
16652300-308	W		HA			●				
16652320-328	W	ULTRA N	HA			●				
16652410-415	WF	ULTRA N	HB			●				
16652420-425	WF	ULTRA N	HA			●				
16652510-518	W	ULTRA N	HB			●				
16652521-527	W	ULTRA N	HA			●				
16652533-537	W	ULTRA N	HA			●				
16652600-608	W	ULTRA N	HA			●				
16652611-618	W	ULTRA N	HA			●				
16653010-095	W	ULTRA N	HA			●				
16653105-180	W	ULTRA N	HA			●				
16653205-280	W	ULTRA N	HA			●				
16653320-365	W	ULTRA N	HA			●				
16653620-680	W	ULTRA N	HB			●				
16651	WF	CALIDA Z	HA			●				
16654010-095	W	ULTRA N	HA			●				
16654105-140	W	ULTRA N	HA			●				
16654205-240	W	ULTRA N	HA			●				
16654305-330	W	ULTRA N	HA			●				



Solid carbide mills for machining stainless steel

	Z	Type	Surface	Tool holding device	P	M	N	K	S	H	
16670002-132	2	VA	ULTRA MS	HA	●	●			●		
16670150-166	3	VA	ULTRA MS	HB	●	●			●		
16670190-206	4	VA	ULTRA MS	HB	●	●			●		
16670260-274	4	VA	ULTRA MS	HB	●	●			●		
16670320-327	4	VA	ULTRA MS	HB	●	●			●		
16670340-347	5	VA	ULTRA MS	HB	●	●			●		
16670240-250	4	VA	ULTRA MS	HB	●	●			●		
16672002-128	2	VA	ULTRA MS	HA	●	●			●		
16672150-204	4	VA	ULTRA MS	HB	●	●			●		
16674004-132	2	VA	ULTRA MS	HA	●	●			●		
16674170-186	2	VA	ULTRA MS	HA	●	●			●		
16674200-216	2	VA	ULTRA MS	HB	●	●			●		



Solid carbide mills for machining steel up to 52 HRC

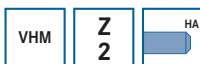
	Z	Type	Surface	Tool holding device	P	M	N	K	S	H	
16972001-009	2	N	RockTec 52	HA	●	●		●	●	●	
16972100-153	2	N	RockTec 52	HA	●	●		●	●	●	
16972200-208	4	N	RockTec 52	HA	●	●		●	●	●	
16972220-228	4	N	RockTec 52	HA	●	●		●	●	●	
16972230-238	4	N	RockTec 52	HA	●	●		●	●	●	
16972240-248	8	N	RockTec 52	HA	●	●		●	●	●	
16972250-258	6	N	RockTec 52	HA	●	●		●	●	●	
16973001-054	2	N	RockTec 52	HA	●	●		●	●	●	
16973100-127	4	N	RockTec 52	HA	●	●		●	●	●	
16973130-145	4	N	RockTec 52	HA	●	●		●	●	●	
16973150-165	4	N	RockTec 52	HA	●	●		●	●	●	
16973170-185	4	N	RockTec 52	HA	●	●		●	●	●	
16976190-201	4	H	RockTec 65	HA	●	●				●	
16974001-008	2	N	RockTec 52	HA	●	●		●	●	●	
16974100-153	2	N	RockTec 52	HA	●	●		●	●	●	
16974200-210	2	N	RockTec 52	HA	●	●		●	●	●	
16974220-230	2	N	RockTec 52	HA	●	●		●	●	●	
16974240-250	2	N	RockTec 52	HA	●	●		●	●	●	
16974260-268	4	N	RockTec 52	HA	●	●		●	●	●	
16974270-278	4	N	RockTec 52	HA	●	●		●	●	●	



Solid carbide mills for machining steel up to 65 HRC

	Z	Type	Surface	Tool holding device	P	M	N	K	S	H	
16975001-009	2	H	RockTec 65	HA	●	●		●	●	●	
16975100-153	2	H	RockTec 65	HA	●	●		●	●	●	
16975200-208	4	H	RockTec 65	HA	●	●		●	●	●	
16975220-228	4	H	RockTec 65	HA	●	●		●	●	●	
16975230-238	4	H	RockTec 65	HA	●	●		●	●	●	
16975240-248	8	H	RockTec 65	HA	●	●		●	●	●	
16975250-258	6	H	RockTec 65	HA	●	●		●	●	●	
16976001-054	2	H	RockTec 65	HA	●	●		●	●	●	
16976100-127	4	H	RockTec 65	HA	●	●		●	●	●	
16976130-145	4	H	RockTec 65	HA	●	●		●	●	●	
16976150-165	4	H	RockTec 65	HA	●	●		●	●	●	
16976170-185	4	H	RockTec 65	HA	●	●		●	●	●	
16942	4	H	TiAlN	HA	●					●	
16977001-008	2	H	RockTec 65	HA	●	●		●	●	●	
16977100-153	2	H	RockTec 65	HA	●	●		●	●	●	
16977200-210	2	H	RockTec 65	HA	●	●		●	●	●	
16977220-230	2	H	RockTec 65	HA	●	●		●	●	●	
16977240-250	2	H	RockTec 65	HA	●	●		●	●	●	
16977260-268	4	H	RockTec 65	HA	●	●		●	●	●	
16977270-278	4	H	RockTec 65	HA	●	●		●	●	●	

ORION® Solid carbide engraving needle
Pre-profiled



Application:
For machining moulding and engraving tools for tool manufacturing and mould forming

- Profile pre-ground for adapting to the material to be machined
- Allowance +0.1 mm

Type A

Execution:

- Form A pre-profiled
- One side halved

Notes:

Must be ready-ground prior to use.

Cutting edge Ø (mm)	Cutting edge length (mm)	Length (mm)	Shaft Ø (mm)	16564... Ident. No.	
3	4.5	40	3	030	●
5	7.5	50	5	050	●
6	9	70	6	060	●
8	12	80	8	080	●
10	15	80	10	100	●

Prod. Gr. 148

ORION® Cemented carbide keyway cutter (Milling cutter design standard DIN 850)



Application:
For producing slots.

- with smooth straight shank
- hollow-ground on side
- in accordance with DIN 850
- from 13.5 mm in diameter, carbide-tipped

Execution:

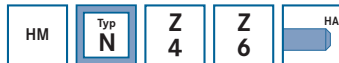
- solid carbide

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16521	70	60	50	40	30	100	225	80	85	55	60	75		45	23				

Cutting edge Ø (mm)	Width of cutting edge (mm)	Length (mm)	Shaft Ø (mm)	Z (PCS)	fz steel 1000 ● (mm)	16521... Ident. No.	
10.5	2	50	8	6	0.035	010	●
10.5	4	50	8	6	0.035	015	●
12.5	2	50	10	6	0.035	020	●
12.5	4	50	10	6	0.035	025	●
13.5	4	50	10	6	0.035	030	●
16.5	5	55	10	6	0.04	035	●
19.5	6	55	10	6	0.04	040	●
22.5	8	60	10	6	0.045	045	●
25.5	6	60	10	6	0.045	050	●
28.5	10	60	10	6	0.045	055	●
32.5	10	65	10	8	0.045	060	●

Prod. Gr. 165

ORION® Cemented carbide T-slot cutter (Milling cutter design standard DIN 851)



Application:
For making T-slots conforming to DIN 650

Execution:
▪ Straight shank according to DIN 1835 A

- Stable cemented carbide cutters
- Cross-toothing
- Corners 0.3 mm x 45°, chamfered
- In accordance with DIN 650



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16525	80	65	55	40	35	100	225	80	85	55	60	75		45	23				

Cutting edge Ø (mm)	Width of cutting edge (mm)	Suitable for T-groove (mm)	Length (mm)	Neck Ø (mm)	Shaft Ø (mm)	Z (PCS)	fz steel 1000 (mm)	Type	N
								●	Ident. No.
16	8	8	63	6.5	10	4	0.03	●	16525... 080
19	9	10	71	8	12	6	0.035	●	100
22	10	12	71	10	12	6	0.035	●	120
25	11	14	90	12	16	6	0.035	●	140
28	12	16	90	13	16	6	0.035	●	160
32	14	18	110	15	20	6	0.045	●	180
36	16	20	115	17	25	6	0.05	●	200
40	18	22	120	19	25	6	0.05	●	220

Prod. Gr. 165

ORION® Cemented carbide single angle milling cutter, 50° and 60°



Application:
For milling ducts and other angular geometries in tool and mechanical engineering.

- Execution:**
- Straight shank according to DIN 1835 A
 - Cutter angles chamfered 0.5 mm x 60° to planing side



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16530016-040	70	60	50	40	30	100	225	80	85	55	60	75		45	23				
16530216-240	70	60	50	40	30	100	225	80	85	55	60	75		45	23				

Chamfer angle (Degree)	Cutting edge Ø (mm)	Width of cutting edge (mm)	Immersion depth (mm)	Length (mm)	Shaft Ø (mm)	Z (PCS)	fz steel 1000 (mm)	Form	C
								●	Ident. No.
50	16	4	15	50	10	4	0.04	●	16530... 016
60	16	6	15	50	10	4	0.04	●	216
50	20	5	21	56	12	6	0.04	●	020
60	20	7	21	56	12	6	0.04	●	220
50	25	6	23	63	12	6	0.045	○	025
60	25	8	23	63	12	6	0.045	●	225
50	32	8	25	70	16	6	0.045	●	032
60	32	10	25	70	16	6	0.045	●	232
50	40	10	30	80	20	6	0.05	●	040
60	40	12	30	80	20	6	0.05	●	240

Prod. Gr. 165

ORION® Solid carbide quarter circle milling cutter Concave



Application:
Quarter circle milling cutter for machining complex forms, e.g. for very small radii on bores. With reduced diameter on the radius runoff so it can be used even in confined working conditions.

- Execution:**
- Straight shank pursuant to DIN 1636 HA
 - Straight grooved
 - K15 micro-fine grain





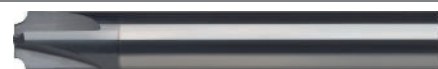
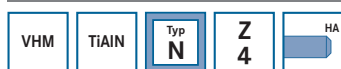
Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16711625-850	170	150	100	90	75	185	230	75	75	65	65	160		120	20	20	20		

Radius (mm)	Min. cutting edge Ø (mm)	Max. cutting edge Ø (mm)	Clearance length (mm)	Length (mm)	Clearance Ø (mm)	Shaft Ø (mm)	Z (PCS)	fz steel 1000 ● (mm)	16711... Ident. No.
0.25	0.5	1	2.5	50	1	3	2	0.005	625 ●
0.3	0.5	1.2	2.5	50	1.2	3	2	0.006	630 ●
0.4	0.5	1.4	2.5	50	1.4	3	2	0.006	640 ●
0.5	0.5	1.6	2.5	50	1.6	3	2	0.007	650 ●
0.6	0.5	1.8	3	50	1.8	3	2	0.008	660 ●
0.7	0.5	2.1	3	50	2.1	3	2	0.008	670 ●
0.8	0.8	2.5	4	50	2.5	3	2	0.009	680 ●
0.9	0.8	2.9	4	50	2.9	3	2	0.01	690 ●
1	0.8	2.9	4	50	2.9	3	2	0.012	700 ●
1.25	0.8	3.4	4	50	3.4	5	2	0.015	725 ●
1.5	1.5	4.6	6	50	4.6	5	2	0.017	750 ●
1.75	1.5	5.6	6	50	5.6	6	2	0.019	775 ●
2	1.5	5.6	8	50	5.6	6	2	0.022	800 ●
2.25	1.5	6.6	10	50	6.6	8	2	0.025	825 ●
2.5	1.5	6.6	10	50	6.6	8	2	0.028	850 ●

Prod. Gr. 150

ORION® Solid carbide quarter circle milling cutter

Concave



Application:

Quarter circle milling cutter for machining complex forms, e.g. bore radii in materials up to 1300 N/mm².

Execution:

- Straight shank pursuant to DIN 1636 HA
- Tolerance R = +/- 0.01 mm

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16711905-960	170	150	100	90	75	185	230	75	75	65	65	160		120	20	20	20		

Radius (mm)	Min. cutting edge Ø (mm)	Max. cutting edge Ø (mm)	Length (mm)	Shaft Ø (mm)	Z (PCS)	fz steel 1000 ● (mm)	16711... Ident. No.
0.5	7	8	70	8	4	0.007	905 ●
1	6	8	70	8	4	0.012	910 ●
1.5	7	10	75	10	4	0.017	915 ●
2	6	10	75	10	4	0.023	920 ●
2.5	7	12	75	12	4	0.028	925 ●
3	6	12	75	12	4	0.032	930 ●
3.5	9	16	80	16	4	0.036	935 ●
4	8	16	80	16	4	0.04	940 ●
4.5	7	16	80	16	4	0.043	945 ●
5	10	20	80	20	4	0.05	950 ●
6	8	20	80	20	4	0.06	960 ●

Prod. Gr. 150

ORION® Solid carbide chamfer cutter



Application:

For cutting chamfers, drilling and countersinking on machining centres and CNC machines.

Execution:

- solid carbide ultra-fine grain
- straight shank in accordance with DIN 1636 HA

▪ uncoated

- No. 16704: 60°
- No. 16705: 90°
- No. 16706: 120°

Notes:

chamfer point flattened 10% of diameter, e.g. dia. 10 = 1 mm



No. 16704



No. 16705



No. 16706

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16704	70	60	35	35	30	280	350	60	70	40	45	135		45	23	18	18		
16705	70	60	35	35	30	280	350	60	70	40	45	135		45	23	18	18		
16706	70	60	35	35	30	280	350	60	70	40	45	135		45	23	18	18		

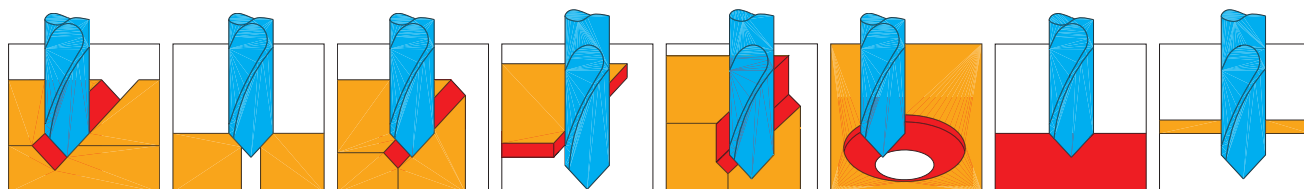
Milling tools monoblock \ Solid carbide form milling cutter

Cutting edge Ø (mm)	Cutting edge length (mm)	Length (mm)	Shaft Ø (mm)	Chamfer angle (Degree)		90		60		120	
				Protective chamfer for milling point (mm)	fz steel 1000 (mm)	16705... Ident. No.		16704... Ident. No.		16706... Ident. No.	
1	2	39	3	0.1	0.01	210	●	-	-	-	-
1.2	2.4	39	3	0.12	0.01	212	●	-	-	-	-
1.5	3	39	3	0.15	0.01	215	●	-	-	-	-
2	4	39	3	0.2	0.01	220	●	-	-	-	-
2.5	5	39	3	0.25	0.01	225	●	-	-	-	-
3	6	50	4	0.3	0.01	230	●	230	●	230	●
4	8	50	5	0.4	0.02	240	●	240	●	240	●
5	10	50	6	0.5	0.02	250	●	250	●	250	●
6	12	60	8	0.6	0.03	260	●	260	●	260	●
8	16	70	10	0.8	0.04	280	●	280	●	280	●
10	18	70	12	1	0.05	300	●	300	●	300	●
12	20	70	12	1.2	0.06	320	●	320	●	320	●
16	26	80	16	1.6	0.08	360	●	360	●	360	●
20	32	100	20	2	0.1	400	●	400	●	400	●

Prod. Gr. 150



Possible applications: solid carbide chamfer cutter



V slot milling

Countersinking

Angle milling

Face milling

Comb. face and bevel milling

Spot drilling*

Drilling*

* Drilling and spot drilling only in cast and non-ferrous metals.



ARE YOU LOOKING FOR PRODUCTS THAT MEET THE TOUGHEST DEMANDS?

WE HAVE WHAT IT TAKES.

For a complete range of products that meet the toughest demands, visit www.iconridge.com



Marking tools
...and your machine marks economically



the AMF-Writer and AMF-Marker are tools for permanently marking workpieces. they are preferably clamped in collet chucks and Weldon chucks, and mounted in the machine spindle of a CNC machine.

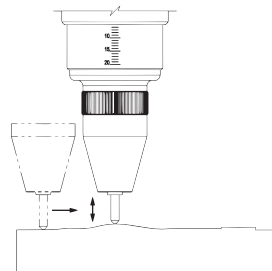
marking is achieved through a combination of material compaction and material displacement, which we call "rolling". in other words, the mark is generated by means of a special needle with extremely hard ball.

through the special design and very high-quality guides, it is possible for this tool to produce uniform and high-quality marking on rough or smooth surfaces which are uneven by between 3 and 9 mm without height compensation from the spindle. it can be infinitely adapted to different materials, material hardnesses and to realise different marking depths.

this tool is especially economical due to the low purchase costs, long service life and the enormous time saving.

advantages at a glance:

- the surface is not weakened or damaged, but compacted and thus strengthened
- high marking speeds are possible
- high wear resistance, resulting in long service life
- also suitable for thin-walled workpieces
- no ridge is produced on the marking line
- high-quality typeface
- workpiece unevenness is compensated for
- also suitable for marking rounded surfaces (up to 15°)
- depending on the version, it is possible to mark surfaces with a hardness of up to 57 HRC
- no noise generated



Are you producing or are you still marking?
...faster rationalisation through significantly reduced marking times



using the marking tools has proven to reduce marking time in the machining centre by over 75 %.

if 60 minutes used to be spent per shift on 60 marking operations in a machining centre, deploying the AMF marking tool will reduce the pure marking time to 12 minutes.

through automated workpiece loading and the ability of the tool to mark at speed, you can achieve savings in series. our customer example shows savings of € 60,000 per year, based on three-shift manufacturing utilisation. This guarantees rapid amortisation of the invested sum.

process	conventional marking method	with marking tool
machine cost (in €/h)	100	100
number of marking operations per shift (8 hrs)	60 pieces	60 pieces
time per marking operation	60 seconds	12 seconds
time per marking operation per shift	60 minutes	12 minutes
costs for marking per shift	€100	€20
annual marking costs (250 working days)	€25,000	€5000
savings per year/shift	€20,000	

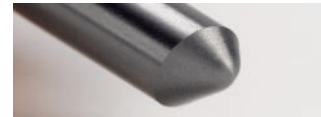


The perfect needle?

the intricate needle is the heart of the marking tool and the guarantee of a perfect typeface. this enables marking by a combination of material compaction and material displacement, which we call "rolling". in other words, the mark is created by a rounded tip, also known as a "ball". the ideal radius of this "ball" varies depending on the material to be marked, the width and depth of the lines and the font size. that's why we offer several versions of the needle, to ensure the best marking results.

the needle design is classified according to the angle, radius and eccentricity of the tip. this means that a needle of 90R10Ex01 design has an angle of 90° at the tip, a radius of 1.0 mm and 0.1 mm eccentricity. a needle of 90R05Ex00 would thus have an angle of 90°, a radius of 0.5 mm and 0.0 mm eccentricity, meaning this would be a centred needle.

we would be glad to support you in the search for the optimal needle for your application.



Marker Extra Large Nadel 90R05 Ex00
Marker Extra Large Nadel 90R10 Ex00
Marker Extra Large Nadel 90R10 Ex01
Marker Extra Large Nadel 90R10 Ex02
Marker Extra Large Nadel 90R10 Ex03
Marker Large Nadel 90R05 Ex00
Marker Large Nadel 90R10 Ex00
Marker Large Nadel 90R10 Ex01
Marker Large Nadel 90R10 Ex02
Marker Large Nadel 90R10 Ex03

ORION® Solid carbide single tooth cutter (Milling cutter design standard Company standard)
1 flute, uncoated



Application:

For milling, recessing and contour milling of non-ferrous metals and plastics.

- uncoated
- right-hand cutting

Execution:

- solid carbide ultra-fine grain
- straight shank in accordance with DIN 6535 HA
- sharp-edged





Delivery:

Up to 3 mm diameter = 10 pieces

Notes:

Minimum order: up to 3.0 mm diameter = 10 pieces

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
16700						180	350	150	200	145	180	260								

					Type	W	
					Surface	Uncoated	
					Tool holding device	HA parallel shank	
					Tolerance of cutting edge Ø	h10	
					Tolerance of shank Ø	h6	
					Z (PCS)	fz alu ● (mm)	16700... Ident. No.
							
1	4	38	3		1	0.008	110 ●
1,5	6	38	3		1	0.01	115 ●
2	8	38	3		1	0.012	120 ●
3	12	38	3		1	0.016	130 ●
4	12	50	6		1	0.03	140 ●
5	14	50	6		1	0.04	150 ●
6	16	50	6		1	0.055	160 ●
8	20	60	8		1	0.065	180 ●
10	22	70	10		1	0.075	200 ●

Prod. Gr. 150

ORION® Solid carbide miniature end mill (Milling cutter design standard Company standard)
2-cutter, uncoated



Application:

Mini end mill in short, sturdy version for universal machining.

Execution:

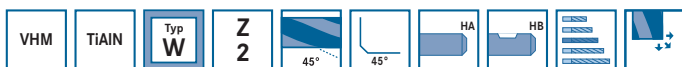
- solid carbide ultra-fine grain
- straight shank in accordance with DIN 6535 HA
- centre cutting

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16713	100	85	40	40	30	200	300	200	250	180	230	350		75	30	30	25		

							Type	N	
							Surface	Uncoated	
							Tool holding device	HA parallel shank	
							Tolerance of cutting edge Ø	+/-0.01	
							Tolerance of shank Ø	h6	
							Z (PCS)	16713... Ident. No.	
							fz steel 1000 ● (mm)		
							2	0.003	330 ●
0.3	1	39	3				2	0.003	340 ●
0.4	1	39	3				2	0.003	350 ●
0.5	1.5	39	3				2	0.003	360 ●
0.6	1.5	39	3				2	0.004	370 ●
0.7	2	39	3				2	0.004	380 ●
0.8	2	39	3				2	0.005	381 ●
0.8	6	39	3				2	0.005	390 ●
0.9	2.5	39	3				2	0.005	400 ●
1	3	39	3				2	0.005	401 ●
1	8	39	3				2	0.005	410 ●
1.1	3	39	3				2	0.006	420 ●
1.2	4	39	3				2	0.006	421 ●
1.2	9	39	3				2	0.006	440 ●
1.4	4	39	3				2	0.007	450 ●
1.5	4	39	3				2	0.008	451 ●
1.5	12	44	4				2	0.008	460 ●
1.6	4	39	3				2	0.009	480 ●
1.8	5	39	3				2	0.009	500 ●
2	5	39	3				2	0.01	501 ●
2	16	44	4				2	0.01	551 ●
2.5	20	60	5				2	0.013	

Prod. Gr. 150

ORION® Solid carbide end mill (Milling cutter design standard Company standard)
2 cutters, TiAlN-coated



No. 16732



No. 16733

Application:

Suitable for plunge milling, groove milling and fitting milling in non-ferrous metals.

Execution:






- Solid carbide ultra-fine grain
- TiAlN coated

- Centre cutting
- With edge protection chamfer
- No. 16732: Straight shank in accordance with DIN 6535 HA
- No. 16733: Straight shank in accordance with DIN 6535 HB

Milling tools monoblock \ Solid carbide mills for universal machining

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GJMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
16732					70	140	180	120	160	110	150	130								
16733					70	140	180	120	160	110	150	130								

Type Surface	W TiAlN	W TiAlN
Tool holding device	HA parallel shank	HB parallel shank
Tolerance of cutting edge Ø	e8	e8
Tolerance of shank Ø	h6	h6

					Z (PCS)	fz alu ● (mm)	16732... Ident. No.	16733... Ident. No.
1	3	50	3	0.05	2	0.008	010	● -
2	5	50	3	0.05	2	0.01	020	● -
3	8	57	6	0.05	2	0.013	030	● 030
4	11	57	6	0.1	2	0.016	040	● 040
5	13	57	6	0.1	2	0.022	050	● 050
6	13	57	6	0.1	2	0.026	060	● 060
8	19	63	8	0.2	2	0.04	080	● 080
10	22	72	10	0.2	2	0.05	100	● 100
12	26	83	12	0.2	2	0.07	120	● 120
14	26	83	14	0.2	2	0.08	140	● -
16	32	92	16	0.2	2	0.09	160	● 160
20	38	104	20	0.2	2	0.12	200	● 200

Prod. Gr. 154

ORION® Solid carbide end mill (Milling cutter design standard Company standard) 2 cutters, TiAlN-coated



No. 16716



No. 16717

Application:

Suitable for universal plunge, groove and clearance milling.

- With edge protection chamfer
- Straight shank pursuant to DIN 6535 HA






Execution:

- **No. 16716:**
 - Solid carbide ultra-fine grain
 - TiAlN-coated
 - Centre cutting

- **No. 16717:**
 - solid carbide ultra-fine grain
 - TiAlN-coated
 - centre cutting
 - with edge protection chamfer
 - straight shank in line with DIN 6535 HB

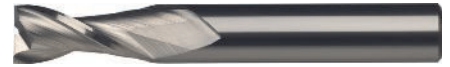
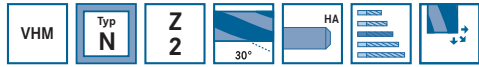
Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GJMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16716010-200	115	90	75	65	60	250	300	160	180	110	130	130		100	55	50	45		
16717030-200	115	90	75	65	60	250	300	160	180	110	130	130		100	55	50	45		

Type Surface	N TiAlN	N TiAlN
Tool holding device	HA parallel shank	HB parallel shank
Tolerance of cutting edge Ø	h8	e8
Tolerance of shank Ø	h6	h6

					Z (PCS)	fz steel 1000 ● (mm)	16716... Ident. No.	16717... Ident. No.
1	2	38	3	0.03	2	0.005	010	● -
1.5	3	38	3	0.03	2	0.008	015	● -
2	6	57	6	0.03	2	0.01	020	● -
2.5	7	57	6	0.05	2	0.02	025	● -
3	7	57	6	0.05	2	0.036	030	● 030
4	8	57	6	0.05	2	0.056	040	● 040
5	10	57	6	0.05	2	0.06	050	● 050
6	10	57	6	0.05	2	0.063	060	● 060
8	16	63	8	0.1	2	0.07	080	● 080
10	19	72	10	0.1	2	0.074	100	● 100
12	22	83	12	0.1	2	0.077	120	● 120
16	26	92	16	0.15	2	0.084	160	● 160
20	32	104	20	0.15	2	0.1	200	● 200

Prod. Gr. 154

ORION® Solid carbide end mill (Milling cutter design standard Company standard)
2-cutter, uncoated



Application:

Suitable for universal plunge milling, groove milling and fitting milling.

Execution:

- Solid carbide ultra-fine grain
- Straight shank in accordance with DIN 6535 HA
- Centre cutting
- Uncoated

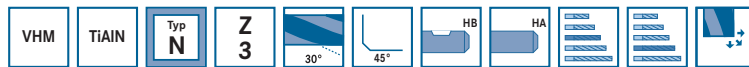
Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16725	105	80	65	60	55	225	270	145	160	100	115	115		90	50	45	40		

Type	N
Surface	Uncoated
Tool holding device	HA parallel shank
Tolerance of cutting edge Ø	h10
Tolerance of shank Ø	h6

mm	mm	mm	mm	Z (PCS)	fz steel 1000 ● (mm)	16725... Ident. No.	
						010	●
1	5	38	3	2	0.004	010	●
1.5	5	38	3	2	0.0055	015	●
2	9	38	3	2	0.0135	020	●
2.5	10	38	3	2	0.022	025	●
3	12	38	3	2	0.029	030	●
3.5	12	40	3.5	2	0.037	035	●
4	12	40	4	2	0.045	040	●
5	14	50	5	2	0.048	050	●
6	16	50	6	2	0.05	060	●
8	22	60	8	2	0.056	080	●
10	22	70	10	2	0.059	100	●
12	22	70	12	2	0.062	120	●
16	25	75	16	2	0.067	160	●

Prod. Gr. 150

ORION® Solid carbide end mill (Milling cutter design standard Company standard)
3 cutters, TiAlN-coated



Application:

Universal end mill for plunge, groove and slot milling as well as for face and circumferential milling.

Execution:

- solid carbide ultra-fine grain

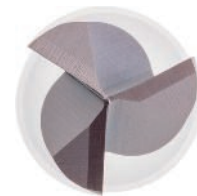
- TiAlN-coated
- centre cutting with new point geometry
- with edge protection chamfer
- No. 16781: straight shank in line with DIN 6535 HB
- No. 16784: straight shank in line with DIN 6535 HA



No. 16781 031, 16781 041, 16781 051, 16781 061, 16781 081, 16781 101, 16781 121, 16781 141, 16781 161, 16781 201








No. 16784 030, 16784 040, 16784 050, 16784 060, 16784 080, 16784 100, 16784 120, 16784 140, 16784 160, 16784 200



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16781030-200	115	90	75	65	60	250	300	160	180	110	130	130		100	55	50	45		
16781031-201	115	90	75	65	60	250	300	160	180	110	130	130		100	55	50	45		
16784030-200	115	90	75	65	60	250	300	160	180	110	130	130		100	55	50	45		
16784031-201	115	90	75	65	60	250	300	160	180	110	130	130		100	55	50	45		

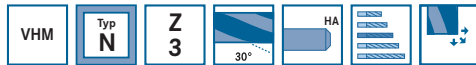
Milling tools monoblock \ Solid carbide mills for universal machining

					Type	N	N	
					Surface	TiAlN	TiAlN	
					Tool holding device	HB parallel shank	HA parallel shank	
					Tolerance of cutting edge Ø	e8	e8	
					Tolerance of shank Ø	h6	h6	
					Z (PCS)	fz steel 1000 ● (mm)	16781... Ident. No.	16784... Ident. No.
					3	0.01	030 ●	030 ●
3	8	57	6	0.05	3	0.01	031 ●	031 ●
4	11	57	6	0.06	3	0.02	040 ●	040 ●
4	19	63	6	0.06	3	0.02	041 ●	041 ●
5	13	57	6	0.08	3	0.02	050 ●	050 ●
5	24	68	6	0.08	3	0.02	051 ●	051 ●
6	13	57	6	0.09	3	0.03	060 ●	060 ●
6	24	72	6	0.09	3	0.03	061 ●	061 ●
8	19	63	8	0.12	3	0.04	080 ●	080 ●
8	38	88	8	0.12	3	0.04	081 ●	081 ●
10	22	72	10	0.15	3	0.05	100 ●	100 ●
10	45	95	10	0.15	3	0.05	101 ●	101 ●
12	26	83	12	0.18	3	0.07	120 ●	120 ●
12	53	110	12	0.18	3	0.07	121 ●	121 ●
14	26	83	14	0.2	3	0.07	140 ●	140 ●
14	53	110	14	0.2	3	0.07	141 ●	141 ●
16	32	92	16	0.2	3	0.09	160 ●	160 ●
16	63	123	16	0.2	3	0.09	161 ●	161 ●
20	38	104	20	0.25	3	0.12	200 ●	200 ●
20	75	141	20	0.25	3	0.12	201 ●	201 ●

Prod. Gr. 154

ORION® Solid carbide end mill (Milling cutter design standard Company standard)

3-cutter, uncoated







Application:
Universal end mill for plunge, groove and slot milling as well as for face and circumferential milling.

- Straight shank pursuant to DIN 6535 HA
- Up to Ø 3 mm - 3-cutter, cutting to the centre
- From Ø 3.5 mm - centre cutting

Execution:
▪ Solid carbide ultra-fine grain

Notes:
Minimum order quantity: up to diameter 3.0 mm = 10 pieces

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16780	105	80	67	60	55	225	270	145	160	100	115	115		90	50	45	40		

					Type	N	
					Surface	Uncoated	
					Tool holding device	HA parallel shank	
					Tolerance of cutting edge Ø	h10	
					Tolerance of shank Ø	h6	
					Z (PCS)	fz steel 1000 ● (mm)	16780... Ident. No.
					3	0.01	010 ●
1.5	5	38	3		3	0.01	015 ●
2	6	38	3		3	0.01	020 ●
2.5	7	38	3		3	0.01	025 ●
3	9	38	3		3	0.01	030 ●
3.5	12	40	3.5		3	0.01	035 ●
4	12	40	4		3	0.02	040 ●
4.5	14	50	4.5		3	0.02	045 ●
5	14	50	5		3	0.03	050 ●
6	16	50	6		3	0.03	060 ●
7	20	60	7		3	0.04	070 ●
8	20	60	8		3	0.05	080 ●
9	22	70	9		3	0.05	090 ●
10	22	70	10		3	0.06	100 ●
11	22	70	11		3	0.07	110 ●
12	22	70	12		3	0.07	120 ●

Prod. Gr. 148

ORION® Solid carbide end mill (Milling cutter design standard Company standard)
3 flutes, TiAlN coated



Application:

Universal end mill for plunge, groove and slot milling as well as for face and circumferential milling.

Execution:

▪ solid carbide ultra-fine grain

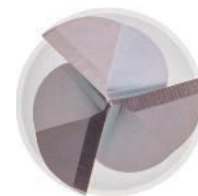
- centre cutting with new point geometry
- with edge protection chamfer
- TiAlN-coated
- **No. 16797:** straight shank in line with DIN 6535 HA
- **No. 16799:** straight shank in line with DIN 6535 HB








No. 16797



No. 16799

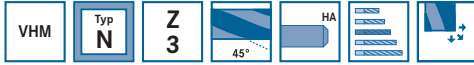


Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16797530-700	105	80	70	60	55	225	270	145	160	100	120	120		90	50	45	40		
16799530-700	105	80	70	60	55	225	270	145	160	100	120	120		90	50	45	40		

						Type	N	N	
						Surface	TiAlN	TiAlN	
						Tool holding device	HA parallel shank	HB parallel shank	
						Tolerance of cutting edge Ø	e8	e8	
						Tolerance of shank Ø	h6	h6	
						Z (PCS)	fz steel 1000 (mm)	16797... Ident. No.	16799... Ident. No.
						3	0.031	530 ●	530 ●
						3	0.048	540 ●	540 ●
						3	0.051	550 ●	550 ●
						3	0.054	560 ●	560 ●
						3	0.06	580 ●	580 ●
						3	0.063	600 ●	600 ●
						3	0.066	620 ●	620 ●
						3	0.069	640 ●	640 ●
						3	0.072	660 ●	660 ●
						3	0.084	700 ●	700 ●

Prod. Gr. 154

ORION® Solid carbide end mill (Milling cutter design standard Company standard)
3-cutter, uncoated



Application:

End mill for universal use when plunge milling, groove milling and keyway cutting as well as face milling and peripheral milling.

- straight shank in accordance with DIN 6535 HA
- up to 3-mm diameter – 3 blades for centre cutting
- from 4-mm diameter – centre cutting

Execution:

- solid carbide ultra-fine grain

Notes:

Minimum order quantity: up to 3.0 mm diameter = 5 pieces

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
16785	95	70	65	55	50	205	245	130	145	90	110	110			80	45	40	35		

Type	N
Surface	Uncoated
Tool holding device	HA parallel shank
Tolerance of cutting edge Ø	h10
Tolerance of shank Ø	h6

Diameter (mm)	Z (PCS)	fz steel 1000 ● (mm)	16785... Ident. No.	
			●	●
1	3	0.0035	010	●
1.5	3	0.0055	015	●
2	3	0.0125	020	●
2.5	3	0.021	025	●
3	3	0.028	030	●
4	3	0.043	040	●
5	3	0.046	050	●
6	3	0.049	060	●
8	3	0.054	080	●
10	3	0.057	100	●
12	3	0.059	120	●
16	3	0.065	160	●
20	3	0.076	200	●

Prod. Gr. 148

ORION® Solid carbide end mill (Milling cutter design standard Company standard)
4 flutes, TiAlN - coated



Application:

End mill for universal machining of non-ferrous metals.

- centre cutting
- with edge protection chamfer
- **No. 16827:** straight shank in accordance with DIN 6535 HA
- **No. 16828:** straight shank in accordance with DIN 6535 HB

Execution:

- solid carbide ultra-fine grain
- TiAlN-coated



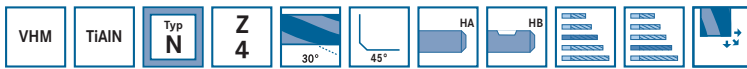
Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16827					40	280	350	125	140	115	125	115			40	35	35		
16828					40	280	350	125	140	115	125	115			40	35	35		

Type	W	W
Surface	TiAlN	TiAlN
Tool holding device	HA parallel shank	HB parallel shank
Tolerance of cutting edge Ø	e8	e8
Tolerance of shank Ø	h6	h6

Diameter (mm)	Z (PCS)	fz alu ● (mm)	16827... Ident. No.		16828... Ident. No.	
			●	●	●	●
2	4	0.01	020	●	020	●
3	4	0.01	030	●	030	●
4	4	0.02	040	●	040	●
5	4	0.02	050	●	050	●
6	4	0.03	060	●	060	●
8	4	0.04	080	●	080	●
10	4	0.05	100	●	100	●
12	4	0.06	120	●	120	●
14	4	0.08	140	●	140	●
16	4	0.08	160	●	160	●
20	4	0.1	200	●	200	●

Prod. Gr. 154

ORION® Solid carbide end mill (Milling cutter design standard Company standard)
4 flutes, TiAlN - coated



Application:
End mill for universal machining.

- with edge protection chamfer
- linear relief
- TiAlN-coated
- **No. 16822:** straight shank in line with DIN 6535 HA
- **No. 16823:** straight shank in line with DIN 6535 HB

Execution:

- solid carbide ultra-fine grain
- centre cutting



No. 16822 020–16822 030, 16822 040, 16822 050, 16822 060, 16822 080, 16822 100, 16822 120, 16822 160, 16822 200



No. 16823 031–16823 051, 16823 061, 16823 081, 16823 101, 16823 121, 16823 161, 16823 201

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16822020-200	115	90	75	65	60	250	300	160	180	110	130	130		100	55	50	45		
16822031-201	115	90	75	65	60	250	300	160	180	110	130	130		100	55	50	45		
16823031-201	115	90	75	65	60	250	300	160	180	110	130	130		100	55	50	45		
16823060-200	115	90	75	65	60	250	300	160	180	110	130	130		100	55	50	45		

					Type Surface	N		N	
					Tool holding device	TiAlN	TiAlN		
					Tolerance of cutting edge Ø	HA parallel shank	HB parallel shank		
					Tolerance of shank Ø	e8	e8		
					Z (PCS)	h6	h6		
					fz steel 1000 (mm)	16822... Ident. No.	16823... Ident. No.		
mm	mm	mm	mm	F _z mm					
2	8	32	2	0.03	4	0.02	020	●	-
3	12	38	3	0.05	4	0.02	030	●	-
3	15	57	6	0.05	4	0.02	031	●	031
4	12	40	4	0.05	4	0.03	040	●	-
4	19	63	6	0.05	4	0.03	041	●	041
5	15	50	5	0.05	4	0.04	050	●	-
5	24	68	6	0.05	4	0.04	051	●	051
6	16	57	6	0.05	4	0.04	060	●	060
6	24	68	6	0.05	4	0.04	061	●	061
8	22	68	8	0.1	4	0.05	080	●	080
8	38	88	8	0.1	4	0.05	081	●	081
10	25	72	10	0.1	4	0.06	100	●	100
10	45	95	10	0.1	4	0.06	101	●	101
12	28	83	12	0.1	4	0.07	120	●	120
12	53	110	12	0.1	4	0.07	121	●	121
16	35	92	16	0.15	4	0.1	160	●	160
16	63	125	16	0.15	4	0.1	161	●	161
20	40	104	20	0.15	4	0.12	200	●	200
20	75	141	20	0.15	4	0.12	201	●	201

Prod. Gr. 154

ORION® Solid carbide end mill (Milling cutter design standard Company standard)
4-cutter, uncoated



Application:

End mill for universal processing.

▪ Centre cutting

▪ Reinforced core cross-section for high stability

Execution:

▪ Solid carbide ultra-fine grain

▪ Straight shank in line with DIN 6535 HB

Notes:

Minimum order quantity: Diameter 3.0 mm = 10 units

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16850	115	90	75	65	60	250	300	160	180	110	130	130		100	55	50	45		

													Type	N							
													Surface	Uncoated							
													Tool holding device	HB parallel shank							
													Tolerance of cutting edge Ø	h10							
													Tolerance of shank Ø	h6							
				Z (PCS)				fz steel 1000 ● (mm)				16850... Ident. No.									
3	8	57	6																		
3.5	10	57	6																		
4	11	57	6																		
4.5	11	57	6																		
5	13	57	6																		
6	13	57	6																		
8	19	63	8																		
10	22	72	10																		
12	26	83	12																		
16	32	92	16																		
20	38	104	20																		

Prod. Gr. 148

ORION® Solid carbide end mill (Milling cutter design standard Company standard)
4 flutes, TiAlN - coated



No. 16837



No. 16838

Application:
End mill for universal processing.

- From Ø 6 mm straight shank in line with DIN 6535 HB
- TiAlN-coated
- Centre cutting
- **No. 16837:**
 - Short version
 - Very high feed rates possible
- **No. 16838:** Long version

Execution:

- Solid carbide ultra-fine grain
- Up to Ø 5 mm straight shank in line with DIN 6535 HA

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	>65 HRC
16837302-305	250	170	130											140				85	
16837306-325	250	170	130											140				85	
16838302-305	250	170	130											140				85	
16838306-325	250	170	130											140				85	

Type	Surface		Tool holding device		Tolerance of cutting edge Ø	Tolerance of shank Ø
	H	H	HB parallel shank	HB parallel shank		
	TiAlN	TiAlN	e8	e8	e8	e8
			h6	h6	h6	h6

D mm	D mm	D mm	D mm	F mm	Z (PCS)	fz steel 1000 (mm)	16837... Ident. No.				16838... Ident. No.								
							302	303	304	305	306	307	308	309	310	311	312	313	314
2	3	32	2	0.05	4	0.02	302	●	-	-	-	-	-	-	-	-	-	-	-
2	8	32	2	0.05	4	0.02	-	-	-	302	●	-	-	-	-	-	-	-	-
3	5	32	3	0.05	4	0.02	303	●	-	-	-	-	-	-	-	-	-	-	-
3	12	38	3	0.05	4	0.02	-	-	-	303	●	-	-	-	-	-	-	-	-
4	8	36	4	0.1	4	0.04	304	●	-	-	-	-	-	-	-	-	-	-	-
4	13	40	4	0.1	4	0.035	-	-	-	304	●	-	-	-	-	-	-	-	-
5	9	45	5	0.1	4	0.05	305	●	-	-	-	-	-	-	-	-	-	-	-
5	15	50	5	0.1	4	0.04	-	-	-	305	●	-	-	-	-	-	-	-	-
6	10	46	6	0.1	4	0.05	306	●	-	-	-	-	-	-	-	-	-	-	-
6	16	58	6	0.1	4	0.04	-	-	-	306	●	-	-	-	-	-	-	-	-
7	20	60	8	0.1	4	0.045	-	-	-	307	●	-	-	-	-	-	-	-	-
8	12	55	8	0.2	4	0.06	308	●	-	-	-	-	-	-	-	-	-	-	-
8	22	70	8	0.2	4	0.05	-	-	-	308	●	-	-	-	-	-	-	-	-
9	22	70	10	0.2	4	0.06	-	-	-	309	●	-	-	-	-	-	-	-	-
10	14	65	10	0.2	4	0.08	310	●	-	-	-	-	-	-	-	-	-	-	-
10	25	73	10	0.2	4	0.07	-	-	-	310	●	-	-	-	-	-	-	-	-
12	16	66	12	0.2	4	0.12	312	●	-	-	-	-	-	-	-	-	-	-	-
12	28	84	12	0.2	4	0.1	-	-	-	312	●	-	-	-	-	-	-	-	-
14	18	70	14	0.2	4	0.13	314	●	-	-	-	-	-	-	-	-	-	-	-
14	30	84	14	0.2	4	0.12	-	-	-	314	●	-	-	-	-	-	-	-	-
16	20	75	16	0.2	4	0.15	316	●	-	-	-	-	-	-	-	-	-	-	-
16	35	93	16	0.2	4	0.13	-	-	-	316	●	-	-	-	-	-	-	-	-
20	25	82	20	0.2	4	0.17	320	●	-	-	-	-	-	-	-	-	-	-	-
20	40	104	20	0.2	4	0.14	-	-	-	320	●	-	-	-	-	-	-	-	-
25	30	92	25	0.2	4	0.18	325	●	-	-	-	-	-	-	-	-	-	-	-
25	50	120	25	0.2	4	0.15	-	-	-	325	●	-	-	-	-	-	-	-	-

Prod. Gr. 150



ORION HPC drilling and stem mill cutters
drilling and ramping with maximum performance

grooves

- very quiet operation and high process stability
- highest feeds during insertion and grooving
- undersize tools for precise fitting grooves

drilling

- very good drilling properties up to 2xD
- no separate pilot tool necessary

ramping

- insertion angle up to 45° possible
- optimum chip removal through special face geometry

rough machining

- high material removal rate due to HPC geometry
- can also be used on less powerful machines due to low power consumption

finishing

- contours with high surface quality
- HPC geometry ensures low-vibration milling



circumferential milling



groove milling



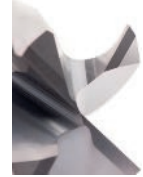
ramp milling



drilling

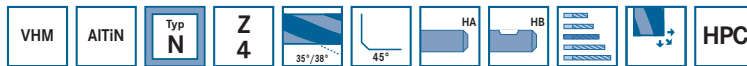


uneven pitch



optimised front chip spaces

ORION solid carbide HPC drilling and plunge milling cutter (Milling cutter design standard Company standard)
4 flutes, AlTiN-coated



Application:

Ramping, grooving, drilling and rough machining with maximum performance. The special point geometry allows for ramp angles up to 45° and drilling up to 2xD without a piloting tool.

- AlTiN-coated
- Centre cutting and clearance
- with 45° edge protection chamfer
- uneven twist angle

Execution:

- point geometry for ramping and drilling
- solid carbide ultra-fine grain

Technical data:

- Z: 4 PCS



Ident. No. 305-320



Ident. No. 405-420

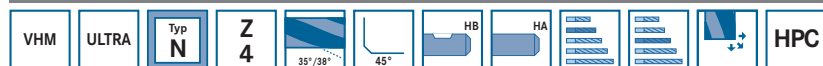
Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16860305-320	210	175	120	120	110									150	60	30	25		
16860405-420	210	175	120	120	110									150	60	30	25		

Type	N	N
Surface	AlTiN	AlTiN
Tool holding device	HA parallel shank	HB parallel shank
Tolerance of cutting edge Ø	h10	h10
Tolerance of shank Ø	h6	h6

Ø mm	Ø mm	Ø mm	Ø mm	Ø mm	Ø mm	F mm	fz steel 1000 ● (mm)	16860... Ident. No.	●	16860... Ident. No.	●
5.7	13	19	57	5.4	6	0.05	0.05	305	●	405	●
6	13	19	57	5.7	6	0.05	0.05	306	●	406	●
7.7	19	25	63	7.3	8	0.1	0.06	307	●	407	●
8	19	25	63	7.6	8	0.1	0.06	308	●	408	●
9.7	22	30	72	9.2	10	0.1	0.07	309	●	409	●
10	22	30	72	9.5	10	0.1	0.07	310	●	410	●
11.7	26	36	83	11.2	12	0.15	0.09	311	●	411	●
12	26	36	83	11.5	12	0.15	0.09	312	●	412	●
13.7	26	36	83	13.2	14	0.15	0.11	313	●	413	●
14	26	36	83	13.5	14	0.15	0.11	314	●	414	●
15.6	32	42	92	15.1	16	0.2	0.12	315	●	415	●
16	32	42	92	15.5	16	0.2	0.12	316	●	416	●
19.5	38	52	104	19	20	0.2	0.14	319	●	419	●
20	38	52	104	19.5	20	0.2	0.14	320	●	420	●

Prod. Gr. 150

ORION® Solid carbide HPC end mill (Milling cutter design standard Company standard)
4 flutes, ULTRA-coated



Application:
 HPC end mill with uneven twist and uneven pitch for universal rough machining and smoothing.

- Edge-rounded flutes
- Centre cutting
- Uneven flute pitch

Execution:

- Solid carbide ultra-fine grain
- Straight shank in line with DIN 6535 HB
- ULTRA-coated
- With clearance
- Uneven twist angle 35°/38°
- With edge protection chamfer

Advantage:

- Extremely smooth running
- Reduced oscillation
- Higher feed rates and cutting depths possible
- Ideal for static and dynamic trochoidal milling
- Defined edge rounding for outstanding service life



Ident. No. 200, 202, 204, 206, 208, 210, 212, 216, 220



Ident. No. 201, 203, 205, 207, 209, 211, 213, 217, 221

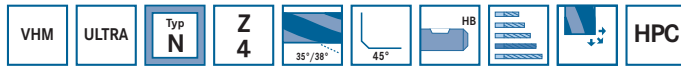


Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GJMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16851200-220	230	190	150	120	100			350	300	240	280			160	100	70	70		
16851201-221	230	190	150	120	100			350	300	240	280			160	100	70	70		
16851222-250	230	190	150	120	100			350	300	240	280			160	100	70	70		
16851223-251	230	190	150	120	100			350	300	240	280			160	100	70	70		

							Type Surface	N				
							Tool holding device	ULTRA	ULTRA			
							Tolerance of cutting edge Ø	HB parallel shank e8	HA parallel shank e8			
							Tolerance of shank Ø	h6	h6			
							Z (PCS)	fz steel 1000 (mm)	16851... Ident. No.	16851... Ident. No.		
3	8	10	54	2.8	6	0.05	4	0.03	200	●	250	●
3	8	13	57	2.8	6	0.05	4	0.03	201	●	251	●
4	8	14	54	3.8	6	0.1	4	0.035	204	●	224	●
4	11	17	57	3.8	6	0.1	4	0.035	205	●	225	●
5	9	14	54	4.7	6	0.1	4	0.04	202	●	222	●
5	13	17	57	4.7	6	0.1	4	0.04	203	●	223	●
6	10	17	54	5.8	6	0.1	4	0.05	206	●	226	●
6	13	19	57	5.8	6	0.1	4	0.05	207	●	227	●
8	12	22	58	7.7	8	0.2	4	0.06	208	●	228	●
8	21	25	63	7.7	8	0.2	4	0.06	209	●	229	●
10	14	26	66	9.7	10	0.2	4	0.07	210	●	230	●
10	22	30	72	9.7	10	0.2	4	0.07	211	●	231	●
12	16	28	73	11.6	12	0.2	4	0.08	212	●	232	●
12	26	36	83	11.6	12	0.2	4	0.08	213	●	233	●
16	22	34	82	15.5	16	0.2	4	0.12	216	●	236	●
16	36	42	92	15.5	16	0.2	4	0.12	217	●	237	●
20	26	42	92	19.5	20	0.2	4	0.14	220	●	240	●
20	41	52	104	19.5	20	0.2	4	0.14	221	●	241	●

Prod. Gr. 150

ORION® Solid carbide HPC end mill (Milling cutter design standard Company standard)
4 flutes, ULTRA-coated



Application:
HPC end mill with uneven twist and uneven pitch for universal rough machining and smoothing.

Execution:

- Solid carbide ultra-fine grain
- Straight shank in line with DIN 6535 HB
- ULTRA-coated
- With clearance
- Uneven twist angle 35°/38°
- With edge protection chamfer

- Edge-rounded flutes
- Centre cutting
- Uneven flute pitch
- Chip breaker on every flute

Advantage:

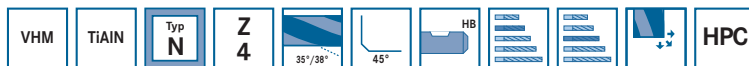
- Optimal suitability for trochoidal milling
- With chip breaker geometry for short chips
- HPC geometry for highest feed rates and smooth running
- Suitable for large cutting depths



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16851284-294	230	190	150	120	100			350	300	240	280			160	100	70	70		
																		Type	N
																		Surface	ULTRA
																		Tool holding device	HB parallel shank
																		Tolerance of cutting edge Ø	e8
																		Tolerance of shank Ø	h6
													Z (PCS)	fz steel 1000 ● (mm)	16851... Ident. No.				
6	18	24	24	62	5.8	6	0.1	4	0.05	284	●								
8	24	30	30	68	7.7	8	0.2	4	0.06	286	●								
10	31	38	38	80	9.7	10	0.2	4	0.07	288	●								
12	41	46	46	93	11.6	12	0.2	4	0.08	290	●								
16	51	58	58	108	15.5	16	0.2	4	0.11	292	●								
20	61	74	74	126	19.5	20	0.2	4	0.13	294	●								

Prod. Gr. 150

ORION® Solid carbide HPC end mill (Milling cutter design standard Company standard)
4 flutes, TiAlN - coated



Application:
HPC end mill with unequal twist and uneven distribution for universal roughing and finishing.

Execution:

- Solid carbide ultra-fine grain
- Straight shank pursuant to DIN 6535 HB
- TiAlN-coated
- With clearance
- Unequal twist angle 35°/38°








- With edge protection chamfer
- Rounded cutting edge
- Centre cutting
- Unequal cutter pitch

Advantage:

- Roughing and finishing with just one tool
- Ideally suitable for trochoidal milling
- Enables higher feed rates and greater cutting depths

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
16853201-217	200	160	130	105	85			300	255	205	240			135	85	60	60			
16853202-218	200	160	130	105	85			300	255	205	240			135	85	60	60			
																		Type	N	
																		Surface	TiAlN	
																		Tool holding device	HB parallel shank	
																		Tolerance of cutting edge Ø	e8	
																		Tolerance of shank Ø	h6	
															Z (PCS)	fz steel 1000 ● (mm)	16853... Ident. No.			
3	5	12	50	2.8	6	0.1	4	0.027	201	●										
3	8	15	57	2.8	6	0.1	4	0.027	202	●										
4	8	15	54	3.8	6	0.1	4	0.036	203	●										
4	11	18	57	3.8	6	0.1	4	0.036	204	●										



							Type	N	
							Surface	TiAlN	
							Tool holding device	HB parallel shank	
							Tolerance of cutting edge Ø	e8	
							Tolerance of shank Ø	h6	
							Z (PCS)	fz steel 1000 ● (mm)	16853... Ident. No.
5	9	15	54	4.8	6	0.1	4	0.03	205 ●
5	13	18	57	4.8	6	0.1	4	0.03	206 ●
6	10	18	54	5.7	6	0.15	4	0.045	207 ●
6	13	21	57	5.7	6	0.15	4	0.045	208 ●
8	12	22	58	7.7	8	0.15	4	0.055	209 ●
8	19	27	63	7.7	8	0.15	4	0.055	210 ●
10	14	26	66	9.5	10	0.2	4	0.06	211 ●
10	22	32	72	9.5	10	0.2	4	0.06	212 ●
12	16	28	73	11.5	12	0.2	4	0.07	213 ●
12	26	38	83	11.5	12	0.2	4	0.07	214 ●
16	22	34	82	15.5	16	0.35	4	0.1	215 ●
16	32	44	92	15.5	16	0.35	4	0.1	216 ●
20	26	42	92	19.5	20	0.45	4	0.13	217 ●
20	38	54	104	19.5	20	0.45	4	0.13	218 ●








Prod. Gr. 150

ORION® Solid carbide roughing and finishing cutter (Milling cutter design standard Company standard) ● ● ● ●
 4-6 flutes, TiAlN coated



- Application:**
 Roughing cutter for universal machining.
- Straight shank in accordance with DIN 6535 HB
 - TiAlN-coated
- Execution:**
- Solid carbide ultra-fine grain
 - Centre cutting
 - With clearance

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GJMw	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16847	95	80	75	55	55									120	35				

							Type	NF	
							Surface	TiAlN	
							Tool holding device	HB parallel shank	
							Tolerance of cutting edge Ø	h10	
							Tolerance of shank Ø	h6	
							Z (PCS)	fz steel 1000 ● (mm)	16847... Ident. No.
6	13	21	57	5.8	6	0.1	4	0.04	306 ●
8	16	27	63	7.8	8	0.2	4	0.043	308 ●
10	22	32	72	9.8	10	0.2	4	0.05	310 ●
12	26	38	83	11.8	12	0.2	4	0.058	312 ●
14	26	38	83	13.8	14	0.2	4	0.065	314 ●
16	32	44	92	15.8	16	0.3	6	0.108	316 ●
20	38	54	104	19.8	20	0.3	6	0.13	320 ●
25	45	54	121	24.8	25	0.3	6	0.15	325 ●

Prod. Gr. 150

ORION® SC roughing cutter (Milling cutter design standard Company standard)
4-6 flutes, TiAlN coated



Application:

For rough cutting at high feed rates and with rigid clamping, up to Vc 160 m/min possible

Execution:

- Solid carbide ultra-fine grain
- Straight shank in accordance with DIN 6535 HB
- TiAlN-coated
- Centre cutting

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16849306-320	100	90	80	70	65	300	250	135	145	110	125			115	35	30	30		

Type	HR
Surface	TiAlN
Tool holding device	HB parallel shank
Tolerance of cutting edge Ø	e8
Tolerance of shank Ø	h6

D (mm)	D (mm)	D (mm)	D (mm)	D (mm)	F (mm)	Z (PCS)	fz steel 1000 (mm)	16849... Ident. No.	
								306	•
6	16	57	6	0.1	4	0.044	306	•	
7	16	63	8	0.1	4	0.046	307	•	
8	16	63	8	0.2	4	0.048	308	•	
9	19	72	10	0.2	4	0.052	309	•	
10	22	72	10	0.2	4	0.056	310	•	
12	25	83	12	0.2	4	0.064	312	•	
14	32	83	14	0.2	4	0.072	314	•	
16	32	92	16	0.3	5	0.1	316	•	
18	32	92	18	0.3	6	0.13	318	•	
20	38	104	20	0.3	6	0.145	320	•	

Prod. Gr. 150

ORION® SC roughing cutter (Milling cutter design standard Company standard)
3-5 flutes, TiAlN - coated



Application:

For universal rough milling with maximum cutting performance.

Execution:

- Centre cutting
- With edge protection chamfer
- Fine notch separation
- Ident. No. 040, 051, 061, 081, 101, 121, 161, 201-251: Long version
- Ident. No. 050, 060, 080, 100, 120, 160, 200: Short version

Ident. No. 040, 051, 061, 081, 101, 121, 161, 201-251
Short version



Ident. No. 050, 060, 080, 100, 120, 160, 200

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16852040-251	110	80				175		135		110				100					
16852050-200	110	80				175		135		110				100					

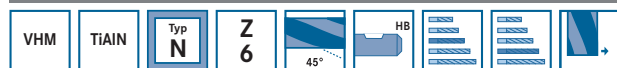
Type	NR
Surface	TiAlN
Tool holding device	HB parallel shank
Tolerance of cutting edge Ø	e8
Tolerance of shank Ø	h6

D (mm)	D (mm)	D (mm)	D (mm)	D (mm)	F (mm)	Z (PCS)	fz steel 1000 (mm)	16852... Ident. No.	
								040	•
4	8	54	6	0.1	3	0.024	040	•	
5	8	54	6	0.1	3	0.03	050	•	
5	16	57	6	0.1	3	0.03	051	•	
6	8	54	6	0.1	3	0.036	060	•	
6	16	57	6	0.1	3	0.036	061	•	
8	11	58	8	0.2	3	0.048	080	•	
8	19	63	8	0.2	3	0.048	081	•	
10	13	66	10	0.2	4	0.072	100	•	
10	22	72	10	0.2	4	0.072	101	•	
12	16	73	12	0.2	4	0.08	120	•	
12	26	83	12	0.2	4	0.08	121	•	
16	19	82	16	0.3	4	0.096	160	•	
16	32	92	16	0.3	4	0.096	161	•	
20	19	92	20	0.3	4	0.115	200	•	
20	38	104	20	0.3	4	0.115	201	•	
25	45	121	25	0.3	5	0.16	251	•	

Prod. Gr. 154

ORION® SC multi-tooth mills (Milling cutter design standard Company standard) ● ● ● ● ●

6 cutters, TiAlN-coated



Application:
For circumferential milling as a finishing process to create a high surface quality. Face cut only with shallow cutting depths.

- straight shank in line with DIN 6535 HB
- TiAlN-coated
- **No. 16876:** Standard version
- **No. 16881:** Long version

Execution:
▪ solid carbide ultra-fine grain



No. 16876



No. 16881



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)/FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16876040-200	115	85	70	60	57	330	380	170	210	150	180	135		125	50	40			
16881040-200	105	75	65	55	50	300	340	155	190	135	160	120		115	45	35			

Type Surface	N TiAlN	N TiAlN	Tool holding device	Tolerance of cutting edge Ø	Tolerance of shank Ø	Z (PCS)	fz steel 1000 (mm)	16876... Ident. No.		16881... Ident. No.	
								HB parallel shank	f8	h5	h5

Prod. Gr. 154

ORION® SC multi-tooth mills (Milling cutter design standard Company standard) ● ● ● ● ●

6-8 flutes, TiAlN coated



Application:
HSC milling also for dry machining, for machining up to 64 HRC

- Execution:**
- Solid carbide ultra-fine grain
 - Straight shank pursuant to DIN 6535 HA
 - TiAlN-coated
 - Without centre cutting







Ident. No. 040-050, 060, 080, 100, 120, 160, 200



Ident. No. 051, 061, 081, 101, 121, 161, 201-251

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)/FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16883040-200		90	80	60										125		40		80	60
16883051-251		80	70	55										115				70	55

Milling tools monoblock \ Solid carbide mills for universal machining

							Type	H
							Surface	TiAlN
							Tool holding device	HA parallel shank
							Tolerance of cutting edge \varnothing	e8
							Tolerance of shank \varnothing	h6
					Z (PCS)	fz hard 65 HRC \bullet (mm)	16883... Ident. No.	
4	11	57	6		6	0.01	040	●
5	13	57	6		6	0.01	050	●
5	18	62	6		6	0.008	051	●
6	13	57	6		6	0.014	060	●
6	18	62	6		6	0.01	061	●
8	19	63	8		6	0.02	080	●
8	24	68	8		6	0.016	081	●
10	22	72	10		6	0.025	100	●
10	30	80	10		6	0.02	101	●
12	26	83	12		6	0.03	120	●
12	36	93	12		6	0.025	121	●
16	32	92	16		8	0.04	160	●
16	48	108	16		8	0.035	161	●
20	38	104	20		8	0.045	200	●
20	60	126	20		8	0.04	201	●
25	95	160	25		8	0.05	251	●

Prod. Gr. 154

ORION® Solid carbide torus milling cutter (Milling cutter design standard Company standard) 3-4 flutes, TiAlN coated



Application:

Torus milling cutter for universal machining.






- TiAlN-coated

Execution:


- Solid carbide ultra-fine grain
- Straight shank in accordance with DIN 6535 HA

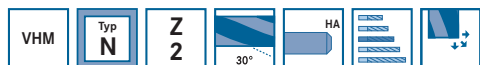
- 3-4 cutters
- Centre cutting
- Edge radius
- Chip chamber lowered from the face over the length of the diameter

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16862500-509	130	110	120															80	60

							Type	H	
							Surface	TiAlN	
							Tool holding device	HA parallel shank	
							Tolerance of cutting edge \varnothing	e8	
							Tolerance of shank \varnothing	h6	
						Z (PCS)	fz steel 1000 \bullet (mm)	16862... Ident. No.	
2	0.5	7	57	6		3	0.03	500	●
3	0.5	8	57	6		3	0.035	501	●
4	1	11	57	6		3	0.04	502	●
5	1	13	57	6		3	0.05	503	●
6	1	13	65	8		4	0.055	504	●
8	2	19	80	8		4	0.06	505	●
10	2	22	100	10		4	0.065	506	●
12	3	26	100	12		4	0.075	507	●
14	3	26	104	12		4	0.08	508	●
16	4	32	115	16		4	0.09	509	●

Prod. Gr. 148

ORION® Solid carbide mini radius milling cutter (Milling cutter design standard 
 Company standard)
 2-cutter, uncoated



Application:





Miniature radius milling cutter in a short, stable design for universal machining.

Execution:

- Solid carbide ultra-fine grain
- Straight shank in accordance with DIN 6535 HA
- With clearance
- Cutter tolerance: +/- 0.02 mm

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16738	90	60	55	40	35	175	190	110	130	90	120	125		60	30	30	25		

Type	N
Surface	Uncoated
Tool holding device	HA parallel shank
Tolerance of cutting edge Ø	+/-0.02
Tolerance of shank Ø	h6

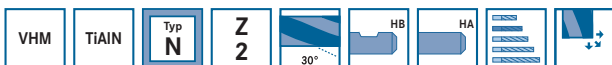
 mm	 mm	 mm	 mm	Z (PCS)	fz steel 1000 ● (mm)	16738... Ident. No.	
0.25	0.5	39	3	2	0.004	325	●
0.3	1	39	3	2	0.005	330	●
0.4	1	39	3	2	0.006	340	●
0.5	1.5	39	3	2	0.008	350	●
0.6	1.5	39	3	2	0.01	360	●
0.8	2	39	3	2	0.018	380	●
1	3	39	3	2	0.024	400	●
1.2	4	39	3	2	0.029	420	●
1.4	4	39	3	2	0.034	440	●
1.5	4	39	3	2	0.036	450	●
1.6	4	39	3	2	0.037	460	●
1.8	5	39	3	2	0.038	480	●
2	5	39	3	2	0.04	500	●
2.5	7	39	3	2	0.044	550	●

Prod. Gr. 150

ORION® Solid carbide radius cutter (Milling cutter design standard Company standard)



2 cutters, TiAlN-coated



Application:

Radius milling cutter for universal use for copy milling in dip working and mould construction.

Execution:

- Solid carbide ultra-fine grain
- TiAlN-coated
- Full radius

- Centre cutting

▪ **Ident. No. 020, 030, 040, 050, 060, 080, 100, 120, 160, 200:** Straight shank in accordance with DIN 6535 HB

▪ **Ident. No. 021, 031, 041, 051, 061, 081, 101, 121, 161, 201:** Straight shank in accordance with DIN 6535 HA



Ident. No. 020, 030, 040, 050, 060, 080, 100, 120, 160, 200
Shank HB



Ident. No. 021, 031, 041, 051, 061, 081, 101, 121, 161, 201

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)/FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16741020-200	85	75	65	45	45	300	350	130	160	110	135	225		100	35	30	30		
16741021-201	85	75	65	45	45	300	350	130	160	110	135	225		100	35	30	30		

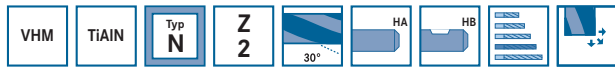
Type	N						
	TiAlN	TiAlN					
Surface	HB parallel shank	HA parallel shank					
Tool holding device	h10	h10					
Tolerance of cutting edge Ø	h5	h5					
Tolerance of shank Ø	h5	h5					
Z (PCS)	fz steel 1000 (mm)	16741... Ident. No.	16741... Ident. No.				
2	5	50	6	2	0.0155	020	021
3	5	50	6	2	0.024	030	031
4	8	54	6	2	0.036	040	041
5	9	54	6	2	0.045	050	051
6	10	54	6	2	0.054	060	061
8	12	58	8	2	0.072	080	081
10	14	66	10	2	0.084	100	101
12	16	73	12	2	0.096	120	121
16	22	82	16	2	0.12	160	161
20	26	92	20	2	0.145	200	201

Prod. Gr. 154

ORION® Solid carbide radius cutter (Milling cutter design standard Company standard)



2 cutters, TiAlN-coated



Application:
Radius milling cutter for universal use for copy milling in dip working and mould construction.

- Centre cutting
- Full radius
- **No. 16742:** Straight shank in accordance with DIN 6535 HA
- **No. 16743:** Straight shank in accordance with DIN 6535 HB



No. 16742
Shank HA



No. 16743

Execution:
▪ Solid carbide ultra-fine grain
▪ TiAlN-coated

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16742	90	80	70	50	50	495	495	150	170	130	150	250		110	40	35	35		
16743	90	80	70	50	50	495	495	150	170	130	150	250		110	40	35	35		

							Type	N		
							Surface	TiAlN		
							Tool holding device	HA parallel shank		
							Tolerance of cutting edge Ø	e8		
							Tolerance of shank Ø	h6		
							Z (PCS)	fz steel 1000 (mm)	16742... Ident. No.	16743... Ident. No.
							2	0.02	030	•
							2	0.03	040	•
							2	0.038	050	•
							2	0.045	060	•
							2	0.06	080	•
							2	0.07	100	•
							2	0.08	120	•
							2	0.1	160	•
							2	0.12	200	•

Prod. Gr. 154

ORION® Solid carbide radius cutter (Milling cutter design standard Company standard)



2 cutters, TiAlN-coated



Application:
Radius milling cutter for universal use for copy milling in dip working and mould construction.

- Straight shank in accordance with DIN 6535 HA
- TiAlN-coated
- Centre cutting
- Exact radius with a milling angle of 220°



Execution:
▪ Solid carbide ultra-fine grain

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16749	90	80	70	50	50	495	495	150	170	130	150	250		110	40	35	35		

							Type	N		
							Surface	TiAlN		
							Tool holding device	HA parallel shank		
							Tolerance of cutting edge Ø	f8		
							Tolerance of shank Ø	h6		
							Z (PCS)	fz steel 1000 (mm)	16749... Ident. No.	
							2	0.014	110	•
							2	0.021	115	•
							2	0.028	120	•
							2	0.042	130	•
							2	0.056	140	•
							2	0.07	150	•
							2	0.084	160	•
							2	0.115	180	•
							2	0.14	200	•

Prod. Gr. 150



ORION® Solid carbide single tooth cutter (Milling cutter design standard Company standard)

1 flute, uncoated



Application:

For milling, recessing and contour milling of non-ferrous metals and plastics.

- uncoated
- right-hand cutting

Execution:

- solid carbide ultra-fine grain
- straight shank in accordance with DIN 6535 HA
- sharp-edged

Delivery:

Up to 3 mm diameter = 10 pieces

Notes:

Minimum order: up to 3.0 mm diameter = 10 pieces

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
16700						180	350	150	200	145	180	260								

										Type	W		
										Surface	Uncoated		
										Tool holding device	HA parallel shank		
										Tolerance of cutting edge Ø	h10		
										Tolerance of shank Ø	h6		
										Z (PCS)	fz alu ● (mm)	16700... Ident. No.	
										1	0.008	110	●
1.5	6	38	3							1	0.01	115	●
2	8	38	3							1	0.012	120	●
3	12	38	3							1	0.016	130	●
4	12	50	6							1	0.03	140	●
5	14	50	6							1	0.04	150	●
6	16	50	6							1	0.055	160	●
8	20	60	8							1	0.065	180	●
10	22	70	10							1	0.075	200	●

Prod. Gr. 150

ORION® Solid carbide end mill (Milling cutter design standard Company standard)

2-3 flutes, uncoated



No. 16815



No. 16817

Application:

End mill for plunge milling, groove milling and keyway cutting as well as face and side milling in all non-ferrous metals.

- centre cutting
- finishing teeth
- cemented carbide quality K30/40

Execution:

- solid carbide ultra-fine grain

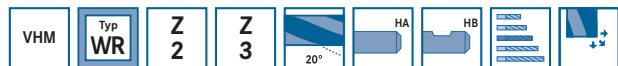
- **No. 16815:** straight shank in accordance with DIN 6535 HA
- **No. 16817:** straight shank in accordance with DIN 6535 HB

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
16815						700	800	240	260	200	220	250								
16817						700	800	240	260	200	220	250								

										Type	W	W			
										Surface	Uncoated	Uncoated			
										Tool holding device	HA parallel shank	HB parallel shank			
										Tolerance of cutting edge Ø	h12	h12			
										Tolerance of shank Ø	h6	h6			
										Z (PCS)	fz alu ● (mm)	16815... Ident. No.	16817... Ident. No.		
										2	0.044	304	●	304	●
5	13	21	57	4.8	6					2	0.049	305	●	305	●
6	13	21	57	5.8	6					2	0.054	306	●	306	●
8	19	27	63	7.8	8					2	0.064	308	●	308	●
10	22	32	72	9.8	10					2	0.072	310	●	310	●
12	26	38	83	11.8	12					3	0.12	312	●	312	●
14	26	38	83	13.8	14					3	0.145	314	○	314	●
16	32	44	92	15.8	16					3	0.17	316	●	316	●
20	38	54	104	19.8	20					3	0.22	320	●	320	●
25	45	65	121	24.8	25					3	0.24	325	●	325	○

Prod. Gr. 150

ORION® SC roughing cutter (Milling cutter design standard Company standard)
2-3 flutes, uncoated



Application:

Suitable for plunge, groove and fret milling on NF metals.

Execution:

- Solid carbide ultra-fine grain
- Centre cutting

- Roughing teeth
- HM quality K30/40
- **No. 16819:** Straight shank in accordance with DIN 6535 HA
- **No. 16821:** Straight shank in accordance with DIN 6535 HB



No. 16819



No. 16821

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GJMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
16819						700	800	240	260	200	220	250								
16821						700	800	240	260	200	220	250								

		Type	
		Surface	
		Tool holding device	
		Tolerance of cutting edge Ø	
		Tolerance of shank Ø	
		Z (PCS)	fz alu ● (mm)
		16819... Ident. No.	
		16821... Ident. No.	
6	13	21	57
8	19	27	7.8
10	22	32	7.8
12	26	38	8
16	32	44	9.8
20	38	54	10
25	45	65	11.8
			121
			24.8
			25
			2
			2
			2
			3
			3
			3
			0.054
			0.064
			0.072
			0.12
			0.17
			0.22
			0.24
			306
			308
			310
			312
			316
			320
			325
			●
			●
			●
			●
			●
			●
			●
			○

Prod. Gr. 150

ORION Solid carbide HSC torus milling cutter (Milling cutter design standard Company standard)
4 flutes, TiAlN - coated



Application:

HSC torus milling cutter with a short cutter for machining steels up to 1300 N/mm² and for hard milling.

Execution:

- Solid carbide ultra-fine grain
- Straight shank in accordance with DIN 6535 HA

- TiAlN-coated
- With clearance
- Edge radius
- Standard design

Advantage:

- specially developed coating for hard machining
- Optimised cutting geometry for plunge milling



Ident. No. 001-028
Standard design



Ident. No. 050-077

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
16942		130	110															100	90






Type	H
Surface	TiAlN
Tool holding device	HA parallel shank
Tolerance of cutting edge Ø	f8
Tolerance of shank Ø	h6

Ø mm	R mm	Ø mm	Ø mm	Ø mm	Ø mm	Ø mm	Z (PCS)	fz hard 65 HRC ● (mm)	16942... Ident. No.	●
3	0.3	6	14	50	2.7	3	4	0.03	001	●
3	0.5	6	14	50	2.7	3	4	0.03	002	●
3	1	6	14	50	2.7	3	4	0.03	003	●
3	0.3	6	32	75	2.7	3	4	0.025	050	●
3	0.5	6	32	75	2.7	3	4	0.025	051	●
3	1	6	32	75	2.7	3	4	0.025	052	●
4	0.4	7	16	50	3.7	4	4	0.04	004	●
4	0.5	7	16	50	3.7	4	4	0.04	005	●
4	1	7	16	50	3.7	4	4	0.04	006	●
4	0.4	7	36	75	3.7	4	4	0.035	053	●
4	0.5	7	36	75	3.7	4	4	0.035	054	●
4	1	7	36	75	3.7	4	4	0.035	055	●
5	0.5	8	18	54	4.6	5	4	0.045	007	●
5	1	8	18	54	4.6	5	4	0.045	008	●
5	1.5	8	18	54	4.6	5	4	0.045	009	●
5	2	8	18	54	4.6	5	4	0.045	010	●
5	0.5	8	40	75	4.6	5	4	0.04	056	●
5	1	8	40	75	4.6	5	4	0.04	057	●
5	1.5	8	40	75	4.6	5	4	0.04	058	●
5	2	8	40	75	4.6	5	4	0.04	059	●
6	0.5	10	21	57	5.5	6	4	0.06	011	●
6	1	10	21	57	5.5	6	4	0.06	012	●
6	1.5	10	21	57	5.5	6	4	0.06	013	●
6	2	10	21	57	5.5	6	4	0.06	014	●
6	0.5	10	44	80	5.5	6	4	0.05	060	●
6	1	10	44	80	5.5	6	4	0.05	061	●
6	1.5	10	44	80	5.5	6	4	0.05	062	●
6	2	10	44	80	5.5	6	4	0.05	063	●
8	0.5	12	27	63	7.4	8	4	0.07	015	●
8	1	12	27	63	7.4	8	4	0.07	016	●
8	1.5	12	27	63	7.4	8	4	0.07	017	●
8	2	12	27	63	7.4	8	4	0.07	018	●
8	0.5	12	63	100	7.4	8	4	0.06	064	●
8	1	12	63	100	7.4	8	4	0.06	065	●
8	1.5	12	63	100	7.4	8	4	0.06	066	●
8	2	12	63	100	7.4	8	4	0.06	067	●
10	0.5	13	32	72	9.2	10	4	0.08	019	●
10	1	13	32	72	9.2	10	4	0.08	020	●
10	1.5	13	32	72	9.2	10	4	0.08	021	●
10	2	13	32	72	9.2	10	4	0.08	022	●
10	0.5	13	72	100	9.2	10	4	0.07	068	●
10	1	13	72	100	9.2	10	4	0.07	069	●
10	1.5	13	72	100	9.2	10	4	0.07	070	●
10	2	13	72	100	9.2	10	4	0.07	071	●
12	0.5	16	38	83	11	12	4	0.09	023	●
12	1	16	38	83	11	12	4	0.09	024	●
12	1.5	16	38	83	11	12	4	0.09	025	●
12	2	16	38	83	11	12	4	0.09	026	●
12	0.5	16	83	120	11	12	4	0.08	072	●
12	1	16	83	120	11	12	4	0.08	073	●
12	1.5	16	83	120	11	12	4	0.08	074	●
12	2	16	83	120	11	12	4	0.08	075	●
16	1	20	44	92	15	16	4	0.11	027	●
16	2	20	44	92	15	16	4	0.11	028	●
16	1	20	92	150	15	16	4	0.1	076	●
16	2	20	92	150	15	16	4	0.1	077	●

Prod. Gr. 148



HSS/HSSE profiling and disc milling cutter

		Cutting material	Type	P	M	N	K	S	H	
15005	HSSE graver	HSSE		●	○	●	●	○		
15461010-080	Quarter circle milling cutter HSSE Co 5 Concave		N	●	○	●	○	○		
15792	T-slot milling cutter HSSE Co 5	HSSE Co5	N	●	○	●	○	○		
15794	T-slot milling cutter HSSE Co 5	HSSE Co5	NF	●	○	●	○	○		
15800	Keyway cutter HSSE Co 5	HSSE Co5	H	●		●	○	●		
15804	Keyway cutter HSSE Co 5	HSSE Co5	N	●		●	○			
15806	Keyway cutter HSSE Co 5	HSSE Co5	N	●		●	○			
15814120-155	Angular milling cutter HSSE Co 5	HSSE Co5	N	●	○	○	○			
15815015-055	Angular milling cutter HSSE Co 5	HSSE Co5	N	●	○	○	○			
14312091-121	Double equal angle milling cutter HSS Type H	HSS	N	●	○	○	○			
14314	HSS single angle milling cutter Type H	HSS	H	●	○	○	○	○		
14332	Radius milling cutter HSSE Co 5 Convex, backed off			●	○	○	○	○		
14345	Profiling cutter HSSE Co 5 For Charpy test specimens		N	●	○	○	○	○		
14103	Narrow disc milling cutter HSSE Co 5 Type N		N	●	○	●	●	●		
14105	HSSE Co 5 narrow disc milling cutter Type N		N	●	○	●	●	●		
14123	Disc milling cutter HSSE Co 5 Type N		N	●	○	●	●	●		
14131	Disc milling cutter HSSE Co 5 Type H		H	●	○	○	●	●		



HSSE/HSSE PM shell end mill

	Cutting material	Z	Type	Surface	P	M	N	K	S	H	
14164		6	N		●	○	●	●			
14169		8	NF		●	○	●	○			
14168		8	NR		●	○	●	○			
14193		6	N		●	○	●	○			
14195		6	W		●	○	●	○			
14244		6	NF		●	○	●	○	○		
14248		8	NF	TiAlN	●	○	●	○	○		
14242		6	NR		●	○	●	○	○		
14247		10	NR	TiAlN	●	○	●	○	○		
14989	HSSE-PM	6	N		●	●	●	●	●		
14990	HSSE-PM	10	N	TiAlN	●	●	●	●	●		
14208	HSSE-PM	6	HF	TiAlN	●	○		●	●		
14207	HSSE-PM	10	HR	TiAlN	●	○		●	●		
14233	HSSE-PM	8	HR		●	○		●	●		
14992	HSSE-PM	10	NF	TiAlN	●	●	●	●	○		
14991	HSSE-PM	6	NR	TiAlN	●	●	●	●	○		



HSSE/HSSE PM angular milling cutter and radius cutter

	Z	Type	Surface	Tool holding device	P	M	N	K	S	H	
15007	1	W		HA			●				
15020020-360	2	N		HB	●	○	○	●	○		
15023010-015	2	N	TiAlN	HB	●	○	○	●	○		
15061	2	W		HB	●	○	●		○		
15063	2	W		HB	●	○	●		○		
15053	2	N		HB	●	○	○	●	○		
15055	2	N	TiAlN	HB	●	○	○	●	○		
15091	3	N		HB	●	○	○	○	○		
15093	3	N	TiCN	HB	●	○	○	○	○		
15102	3	N		HB	●	○	○	○	○	○	
15105	3	N	TiAlN	HB	●	○	○	○	○	○	
15112	3	N		HB	●	○	○	○	○		
15118	3	N	TiAlN	HB	●	○	○	○	○		
15116	3	NR		HB	●	○	○	○	○		
15119	3	NR	TiAlN	HB	●	○	○	○	○		
15215	3	N	TiAlN	HB	●	○	●	○	○		
15124	3	N		HB	●	○	○	○	○		
15901	3	N	TiAlN	HB	●	●	○	○	●		
15159	3	NR	TiAlN	HB	●	●	○	○	●		
15158	3	W	TiAlN	HB	●	●	●	○	●		
15176	4	N		HB	●	○	○	○	○		
15178	6	N	TiAlN	HB	●	○	○	○	○		
15193	4	N		HB	●	○	○	○	○		
15195	6	N	TiAlN	HB	●	○	○	○	○		
15904	4	N	TiAlN	HB	●	○	○	○	○		
15324	6	N		HB	●	○	○	○	○		
15325	4	NR		HB	●	○	○	○	○		
15914	5	N	TiAlN	HB	●	●	○	○	●		
15188	4	N	TiAlN	HB	●	○	○	○	○		
15261	4	NR		HB	●	○	○	○	○		
15263	6	NR	TiAlN	HB	●	○	○	○	○		
15278	4	NF		HB	●	●	○	○	○		
15280	4	NF	TiAlN	HB	●	●	○	○	○		

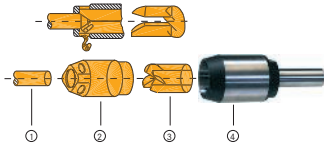


Milling tools monoblock \ Overview page of HSSE/HSSE PM tools

	Z	Type	Surface	Tool holding device	P	M	N	K	S	H	
15272	4	NR		HB	●	●	○	○	○		
15275	4	NR	TiAlN	HB	●	●	○	○	○		
15290	4	HR	TiCN	HB	●	○	○	○	●		
15300	6	HR	TiCN	HB	●	○	○	○	●		
15269	4	NRF	TiAlN	HB	●	○	○	○	○		
15905	5	NR	TiAlN	HB	●	○	○	○	○		
15907	4	NF	TiAlN	HB	●	○	○	○	○		
15311	4	HR	TiAlN	HB	●	○	○	○	●		
15312	6	HF	TiAlN	HB	●	○	○	○	●		
15906	4	NR	TiAlN	HB	●	○	○	○	●		
15908	4	NF	TiAlN	HB	●	○	○	○	●		
15319	4	HR	TiAlN	HB	●	○	○	○	●		
15242	4	NR		HD	●	○	○	○	○		
15350	6	N		Morse taper shank	●	○	○	○	○		
15351	4	NR		Morse taper shank	●	○	○	○	○		
15251	6	N		HB	●	○	○	○	○		
15252	8	N	TiCN/TiN	HB	●	○	○	○	○		
15257	6	NR		HB	●	○	○	○	○		
15258	8	NR	TiCN/TiN	HB	●	○	○	○	○		
15361	2	N		HB	●	○	○	○	○		
15366	2	N		HB	●	○	○	○	○		

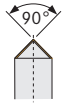


Milling tool for wire and rod ends

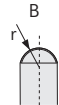


- ① Workpiece
- ② Centring ring
- ③ Cutter
- ④ Clamping chucks

Application: for centred rounding, pointing, levelling and chamfering of wire and rod ends and mass-produced parts with cylindrical or polygonal cross-sections. The HSS milling blade and workpiece centring discs are replaceable. The end-milling tools are used in an advantageous rotary motion.

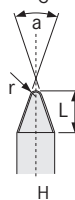
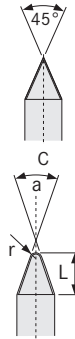


F

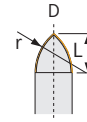


G

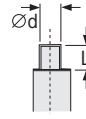
Overview – blade shapes:



H



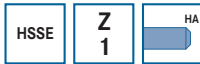
J



E

➔ Prices on request.

ORION® Gravers HSSE
Pre-profiled



Application:

For machining moulding and engraving tools for tool manufacturing and mould forming

- One side halved
- Profile pre-ground for adapting to the material to be machined

Execution:

- Form A pre-profiled

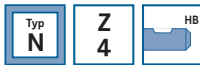
Notes:

Must be ready-ground prior to use.

Cutting edge Ø (mm)	Cutting edge length (mm)	Length (mm)	Shaft Ø (mm)	15005... Ident. No.	
2.5	4	40	2.5	025	●
4	6	60	4	040	●
6	9	80	6	060	●
8	12	90	8	080	●
8	12	125	8	083	●
10	15	125	10	100	●
12	18	125	12	120	●

Prod. Gr. 106

ORION® HSSE Co 5 quarter circle milling cutter (Milling cutter design standard ● ● ● ● ○)
DIN 6518)
Concave



Application:

Quarter circle milling cutter for machining complex forms, e.g. bore radii in materials up to 1000 N/mm².

- From 5.5 mm radius - ground chamfers
- Up to 8 mm radius - combination shank in accordance with DIN 1835 B and D
- From 8.5 mm radius - straight shank in accordance with DIN 1835 B
- For mounting in self-clamping chucks, e. g. Clarkson, Bahnmüller

Execution:

- Finishing teeth
- 5° cutting angle
- Up to 5 mm radius - backed off radially and axially

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15461010-080	34	27	20	18	15	70	175	70	70	45	45	60		30	15	15	15		
15461085-200	34	27	20	18	15	70	175	70	70	45	45	60		30	15	15	15		



Milling tools monoblock \ HSSE form milling tool

Radius (mm)	Min. cutting edge Ø (mm)	Max. cutting edge Ø (mm)	Length (mm)	Shaft Ø (mm)	Z (PCS)	fz steel 700 (mm)	15461... Ident. No.	
1	6	8	60	10	4	0.01	010	●
1.5	6	9	60	10	4	0.01	015	●
2	6	10	60	10	4	0.01	020	●
2.5	6	11	60	10	4	0.01	025	●
3	6	12	60	12	4	0.01	030	●
3.5	6	13	60	12	4	0.01	035	●
4	6	14	60	12	4	0.01	040	●
4.5	6	15	60	12	4	0.01	045	●
5	6	16	60	12	4	0.01	050	●
5.5	8	19	67	16	4	0.02	055	●
6	8	20	67	16	4	0.02	060	●
6.5	8	21	71	16	4	0.02	065	●
7	8	22	71	16	4	0.02	070	●
8	8	24	71	16	4	0.02	080	●
8.5	8	25	85	25	4	0.02	085	●
9	8	26	85	25	4	0.02	090	●
10	8	28	85	25	4	0.02	100	●
11	10	32	90	25	4	0.04	110	●
12	10	34	90	25	4	0.04	120	●
13	16	42	100	25	4	0.06	130	●
14	16	44	100	25	4	0.06	140	●
15	16	46	100	25	4	0.06	150	●
16	16	48	100	25	4	0.06	160	●
18	16	52	112	32	4	0.06	180	●
20	16	56	112	32	4	0.06	200	●

Prod. Gr. 106

ORION® HSSE Co 5 T-slot milling cutter (Milling cutter design standard DIN 851)



Type N / NF

HSSE Co5	Typ N	Typ NF	Z 6	Z 8	Z 10	HB
----------	-------	--------	-----	-----	------	----

Application:
for cutting T-slots conforming to DIN 650

Execution:

- straight shank in accordance with DIN 1835 B
- in accordance with DIN 650
- **No. 15792:**

- type N
- finishing teeth
- cross-cut teeth
- **No. 15794:**
- type NF
- rough machining-finishing teeth
- right-hand twist, approx. 25°



No. 15792



No. 15794

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15792	34	27	20	18	15	70	175	70	70	45	45	60		30	15	15	15		
15794	34	27	20	15	18	70	175	45	45	70	70	60		30	15	15	15		

Cutting edge Ø (mm)	Width of cutting edge (mm)	Suitable for T-groove (mm)	Length (mm)	Neck Ø (mm)	Shaft Ø (mm)	Z (PCS)	fz steel 700 (mm)	Type	N		NF	
									15792... Ident. No.		15794... Ident. No.	
12.5	6	6	57	5	10	6	0.03	060	●	-	-	
16	8	8	62	7	10	6	0.04	080	●	080	●	
18	8	10	70	8	12	6	0.04	090	●	090	●	
19	9	10	71	8	12	6	0.04	100	●	100	●	
21	9	12	74	10	12	8	0.06	110	●	110	●	
22	10	12	75	10	12	8	0.06	120	●	120	●	
25	11	14	82	12	16	8	0.06	140	●	140	●	
28	12	16	85	13	16	8	0.06	160	●	160	●	
32	14	18	90	15	16	8	0.07	180	●	180	●	
36	16	20	103	17	25	8	0.08	200	●	-	-	
36	16	20	103	17	25	10	0.08	-	-	200	●	
40	18	22	108	19	25	8	0.09	220	●	-	-	
40	18	22	108	19	25	10	0.09	-	-	220	●	
45	20	24	113	21	25	10	0.1	240	●	240	●	

Prod. Gr. 106

ORION® HSSE Co 5 keyway cutter (Milling cutter design standard DIN 850)
Type H



HSSE Co5 Typ **H** Z 6 Z 8 Z 10 Z 12 Z 14 HB

Application:
For making grooves (P9) according to DIN 6888.

- Straight-toothed
- Laterally hollow-ground
- Straight shank according to DIN 1835 B

Execution:
▪ HSSE Co 5



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15800	34	27	20	15		70			70		45			30	15	15	15		

Cutting edge Ø (mm)	Width of cutting edge (mm)	Suitable for wood-ruff key	Length (mm)	Shaft Ø (mm)	Z (PCS)	fz steel 700 (mm)	15800... Ident. No.	
4.5	1	1 x 1.4 mm	50	6	6	0.03	010	●
7.5	1.5	1.5 x 2.6 mm	50	6	8	0.03	020	●
7.5	2	2 x 2.6 mm	50	6	8	0.03	030	●
10.5	2	2 x 3.7 mm	50	6	10	0.03	040	●
10.5	2.5	2.5 x 3.7 mm	50	6	10	0.03	050	●
10.5	3	3 x 3.7 mm	50	6	10	0.03	060	●
13.5	3	3 x 5 mm	56	10	10	0.04	070	●
13.5	4	4 x 5 mm	56	10	10	0.04	090	●
16.5	3	3 x 6.5 mm	56	10	10	0.04	080	●
16.5	4	4 x 6.5 mm	56	10	10	0.04	100	●
16.5	5	5 x 6.5 mm	56	10	10	0.04	120	●
19.5	4	4 x 7.5 mm	63	10	12	0.05	110	●
19.5	5	5 x 7.5 mm	63	10	12	0.05	130	●
19.5	6	6 x 7.5 mm	63	10	12	0.05	150	●
22.5	5	5 x 9 mm	63	10	12	0.06	140	●
22.5	6	6 x 9 mm	63	10	12	0.06	160	●
25.5	6	6 x 10 mm	63	10	14	0.07	170	●
28.5	6	6 x 11 mm	63	10	14	0.07	180	●

Prod. Gr. 106

ORION® HSSE Co 5 keyway cutter (Milling cutter design standard DIN 850)
Type N



HSSE Co5 Typ **N** Z 6 Z 8 Z 10 Z 12 Z 14 HB

Application:
For making grooves (P9) according to DIN 6888.

- Cross-toothed
- Straight shank according to DIN 1835 B.
- No. 15804: Laterally hollow-ground
- No. 15806: Cuts on 3 sides

Execution:
▪ HSSE Co 5



No. 15804

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15804	34	16				70	175	70	70	45	45	60		30					
15806	34	16				70	175	45	45	70	70	60		30					

Cutting edge Ø (mm)	Width of cutting edge (mm)	Suitable for woodruff key	Length (mm)	Shaft Ø (mm)	Z (PCS)	fz steel 700 (mm)	15804... Ident. No.		15806... Ident. No.
4.5	1	1 x 1.4 mm	50	6	6	0.02	010	●	-
7.5	1.5	1.5 x 2.6 mm	50	6	6	0.02	020	●	-
7.5	2	2 x 2.6 mm	50	6	6	0.02	030	●	-
10.5	2	2 x 3.7 mm	50	6	8	0.02	040	●	-
10.5	2.5	2.5 x 3.7 mm	50	6	8	0.02	050	●	-
10.5	3	3 x 3.7 mm	50	6	8	0.02	060	●	-
13.5	3	3 x 5 mm	56	10	8	0.03	070	●	-
13.5	4	4 x 5 mm	56	10	8	0.03	090	●	-
16.5	3	3 x 6.5 mm	56	10	8	0.03	080	●	-
16.5	4	4 x 6.5 mm	56	10	8	0.03	100	●	100
16.5	5	5 x 6.5 mm	56	10	8	0.03	120	●	120
19.5	4	4 x 7.5 mm	63	10	10	0.04	110	●	110
19.5	5	5 x 7.5 mm	63	10	10	0.04	130	●	130
19.5	6	6 x 7.5 mm	63	10	10	0.04	150	●	150

Milling tools monoblock \ HSSE form milling tool

Cutting edge Ø (mm)	Width of cutting edge (mm)	Suitable for woodruff key	Length (mm)	Shaft Ø (mm)	Z (PCS)	fz steel 700 (mm)	15804... Ident. No.	15806... Ident. No.
22.5	5	5 x 9 mm	63	10	10	0.05	140	140
22.5	6	6 x 9 mm	63	10	10	0.05	160	160
22.5	8	8 x 9 mm	63	10	10	0.05	190	190
25.5	6	6 x 10 mm	63	10	10	0.05	170	170
28.5	6	6 x 11 mm	63	10	10	0.05	180	180
28.5	8	8 x 11 mm	63	10	10	0.05	200	200
32.5	8	8 x 13 mm	71	12	12	0.07	210	210
32.5	10	10 x 13 mm	71	12	12	0.07	230	230
45.5	10	10 x 16 mm	71	12	14	0.09	240	240

Prod. Gr. 106

ORION® 45° and 60° HSSE Co 5 angle milling cutter Type H



HSSE Co5	Typ N	Z 10	Z 12	HB
----------	-------	------	------	----

Application:

For milling ducts and other angular geometries in tool and mechanical engineering.

Execution:

- Straight-grooved

- Finely toothed
- Straight shank according to DIN 1835 B.
- **No. 15814:** For cutting on periphery and end face
- **No. 15815:** For cutting on periphery



No. 15814



No. 15815

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15814015-055	34	27	20	18	15	70	175	70	70	45	45	60		30					
15814120-155	34	27	20	18	15	70	175	70	70	45	45	60		30					
15815015-055	34	27	20	15	18	70	175	45	45	70	70	60		30					
15815120-155	34	27	20	15	18	70	175	45	45	70	70	60		30					

Chamfer angle (Degree)	Cutting edge Ø (mm)	Width of cutting edge (mm)	Immersion depth (mm)	Length (mm)	Shaft Ø (mm)	Z (PCS)	fz steel 700 (mm)	Form	C	D
								15814... Ident. No.	15815... Ident. No.	
45	16	4	15	60	12	10	0.04	015	015	015
45	20	5	18	63	12	10	0.05	025	025	025
45	25	6.3	22	67	12	10	0.06	040	040	040
45	32	8	23	71	16	12	0.08	055	055	055
60	16	6.3	15	60	12	10	0.04	120	120	120
60	20	8	18	63	12	10	0.05	130	130	130
60	25	10	22	67	12	10	0.06	140	140	140
60	32	12.5	23	71	16	12	0.08	155	155	155

Prod. Gr. 106

ORION® HSS double equal angle milling cutter (Milling cutter design standard DIN 847) Type H



HSS

Application:

For profile milling in materials up to 1000 N/mm².

Execution:

- Bore with longitudinal groove conforming to DIN 138



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
14312011-041	40	32	18	24	19	85		45		50			40						
14312051-081	40	32	18	24	19	85		45		50			40						
14312091-121	40	32	18	24	19	85		45		50			40						

Chamfer angle (Degree)	Cutting edge Ø (mm)	Width (mm)	Bore Ø (mm)	Z (PCS)	fz steel 700 (mm)	14312... Ident. No.	
45	50	8	16	22	0.04	011	●
45	63	10	22	24	0.05	021	●
45	80	12	27	26	0.06	031	●
45	100	18	32	28	0.07	041	●
60	50	10	16	18	0.04	051	●
60	63	14	22	20	0.05	061	●
60	80	18	27	22	0.05	071	●
60	100	25	32	24	0.07	081	●
90	50	14	16	16	0.04	091	●
90	63	20	22	18	0.05	101	●
90	80	22	27	20	0.06	111	●
90	100	32	32	24	0.07	121	●

Prod. Gr. 1HH

ORION® HSS single angle milling cutter (Milling cutter design standard DIN 842) ● ● ● ●
Type H

HSS

Application:
For profile milling in materials up to 1000 N/mm².

Execution:
▪ Bore with longitudinal groove conforming to DIN 138



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
14314	40	32	18	24	19	85		45		50				40					

Cutting edge Ø (mm)	Chamfer angle (Degree)	Width (mm)	Bore Ø (mm)	Z (PCS)	fz steel 700 (mm)	14314... Ident. No.	
50	45	13	13	16	0.04	050	●
63	45	18	16	18	0.05	063	●
80	45	22	22	20	0.06	080	●
100	45	28	27	22	0.07	100	●
125	45	36	32	24	0.08	125	●

Prod. Gr. 1HH

ORION® HSSE Co 5 radius milling cutter (Milling cutter design standard DIN 856) ● ● ● ●
Convex, backed off

Application:
For profile milling in materials up to 1000 N/mm².

Execution:
▪ Bore with longitudinal groove conforming to DIN 138



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
14332	40	32	18	24	19	85		45		50				40					

Radius (mm)	Cutting edge Ø (mm)	Width (mm)	Bore Ø (mm)	Z (PCS)	fz steel 700 (mm)	14332... Ident. No.	
1	50	2	16	16	0.04	011	●
1.5	50	3	16	16	0.04	014	●
2	50	4	16	16	0.04	021	●



Milling tools monoblock \ HSSE form milling tool

Radius (mm)	Cutting edge Ø (mm)	Width (mm)	Bore Ø (mm)	Z (PCS)	fz steel 700 ● (mm)	14332... Ident. No.
2.5	63	5	22	12	0.05	026 ●
3	63	6	22	12	0.05	031 ●
3.5	63	7	22	12	0.05	035 ●
4	63	8	22	12	0.05	040 ●
5	63	10	22	12	0.05	050 ●
6	80	12	27	12	0.06	061 ●
7	80	14	27	12	0.06	071 ●
8	80	16	27	12	0.06	081 ●

Prod. Gr. 1HH

ORION® HSSE Co 5 form milling cutter For Charpy test specimens



- Execution:**
- In relief-ground precision version for ISO V-notch specimens (ISO/V) in accordance with DIN 50115
 - Milling angle 45°
 - V radius R 0.25 mm

Cutting edge Ø (mm)	Milling angle (Degree)	Width (mm)	Bore Ø (mm)	Z (PCS)	fz steel 700 ● (mm)	14345... Ident. No.
75	45	8	27	18	0.06	010 ●

Prod. Gr. 1HH



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
14345	40	32	18	24	19	85			45		50			40					

ORION® HSSE Co 5 narrow disc milling cutter (Milling cutter design standard DIN 1834) Type N, fine cross-cut toothing



- Application:**
For slot milling and parting off
- Execution:**
- Type A
 - Fine cross-toothing
 - Cuts on 3 sides
 - Hole with longitudinal groove according to DIN 138



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
14103	27	22	17	20	11	195	195	160	170	30	30	183		23	18	18	10		

Cutting edge Ø (mm)	Bore Ø (mm)	Z (PCS)	fz steel 700 ● (mm)	1.6		2		2.5		3		4		5		6	
				14103... Ident. No.	●	14103... Ident. No.	●	14103... Ident. No.	●	14103... Ident. No.	●	14103... Ident. No.	●	14103... Ident. No.	●	14103... Ident. No.	●
63	22	28	0.03	305	●	310	●	315	●	320	●	325	●	330	●	335	●
80	27	32	0.04	340	●	345	●	350	●	355	●	360	●	365	●	370	●
100	32	36	0.06	375	●	380	●	385	●	390	●	395	●	400	●	405	●
125	32	40	0.08	415	●	420	●	425	●	430	●	435	●	440	●	445	●
160	40	48	0.11	-	-	460	●	-	-	470	●	475	●	480	●	485	●
200	40	52	0.12	-	-	505	●	-	-	515	●	520	●	-	-	530	●

Prod. Gr. 1HH

ORION® HSSE Co 5 narrow disc milling cutter (Milling cutter design standard

DIN 1834)

Type N, coarse cross-cut toothing



Application:
For slot milling and cutting

- Coarse cross-toothing
- Cutting on 3 sides
- Bore with longitudinal groove to DIN 138

Execution:
▪ Type D



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
14105	27	22	17	20	11	195	195	160	170	30	30	183		23	18	18	10		

Cutting edge Ø (mm)	Bore Ø (mm)	Z (PCS)	Width of cutting edge (mm)	2		2.5		3		4		5	
				fz steel 700 (mm)	Ident. No.	fz steel 700 (mm)	Ident. No.	fz steel 700 (mm)	Ident. No.	fz steel 700 (mm)	Ident. No.	fz steel 700 (mm)	Ident. No.
63	22	16	0.02	310	●	-	-	320	●	-	-	-	-
80	27	20	0.02	345	●	-	-	355	●	360	●	-	-
100	32	24	0.04	380	●	-	-	390	●	395	●	-	-
125	32	26	0.05	420	●	425	●	430	●	435	●	440	●
160	40	30	0.07	460	●	-	-	470	●	-	-	-	-

Prod. Gr. 1HH

ORION® HSSE Co 5 disc milling cutter (Milling cutter design standard DIN 885 A)

Type N, coarse cross-cut toothing



Application:
For slot milling and parting off

- Cuts on 3 sides
- Hole with longitudinal groove according to DIN 138
- Cross-toothing requires less force and ensures quieter operation.

Execution:
▪ Cross-toothing



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
14123	27	22	17	20	11	195	195	160	170	30	30	183		23	18	18	10		

Cutting edge Ø (mm)	Bore Ø (mm)	Z (PCS)	Width of cutting edge (mm)	4		5		6		8		10	
				fz steel 700 (mm)	Ident. No.	fz steel 700 (mm)	Ident. No.	fz steel 700 (mm)	Ident. No.	fz steel 700 (mm)	Ident. No.	fz steel 700 (mm)	Ident. No.
63	22	12	0.03	330	●	335	●	340	●	345	●	350	●
50	16	12	0.02	-	-	310	●	315	●	320	●	-	-
80	27	14	0.04	-	-	375	●	380	●	385	●	390	●
100	32	14	0.06	-	-	-	-	420	●	425	●	430	●
125	32	16	0.08	-	-	-	-	-	-	470	●	475	●
160	40	18	0.1	-	-	-	-	-	-	575	●	580	●

Cutting edge Ø (mm)	Bore Ø (mm)	Z (PCS)	Width of cutting edge (mm)	12		14		16		20	
				fz steel 700 (mm)	Ident. No.	fz steel 700 (mm)	Ident. No.	fz steel 700 (mm)	Ident. No.	fz steel 700 (mm)	Ident. No.
63	22	12	0.03	-	-	-	-	-	-	-	-
50	16	12	0.02	-	-	-	-	-	-	-	-
80	27	14	0.04	395	●	400	○	405	●	-	-
100	32	14	0.06	435	●	440	●	445	●	-	-
125	32	16	0.08	480	●	485	●	490	●	500	●
160	40	18	0.1	-	-	-	-	-	-	-	-

Prod. Gr. 1HH

ORION® HSSE Co 5 disc milling cutter (Milling cutter design standard DIN 885 A)



Type H, fine cross-cut toothing

Application:

For slot milling and parting off

Execution:

▪ Cross-toothing

- Cuts on 3 sides
- Hole with longitudinal groove according to DIN 138
- Cross-toothing requires less force and ensures quieter operation.



Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
14131	27	22	17	20	11	195	195	160	170	30	30	183		23	18	18	10		

Cutting edge Ø (mm)	Bore Ø (mm)	Z (PCS)	Width of cutting edge (mm)	8		10		6		12	
				fz steel 1300 ● (mm)	14131... Ident. No.	14131... Ident. No.	14131... Ident. No.	14131... Ident. No.			
50	16	16	0.02	220	●	225	●	-	-	-	-
63	22	18	0.03	245	●	250	●	240	●	-	-
80	27	20	0.05	285	●	290	●	-	-	295	●
100	32	20	0.08	325	●	330	●	300	○	335	○
125	32	22	0.11	370	●	375	●	-	-	380	●

Prod. Gr. 1HH

ORION® HSSE Co 5 shell end mill (Milling cutter design standard DIN 841)



Typ N	Typ NR	Typ NF	Z 6	Z 8	
-------	--------	--------	-----	-----	--

Execution:

- Hole with longitudinal and lateral slot in line with DIN 138
- Cuts on periphery and end face



No. 14164
Type N



No. 14168
Type NR



No. 14169
Type NF

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
14164	31	26	20	21	17	66	180	57	44	36	36	75		33					
14168	31	26	20	21	17	66	180	57	44	36	36	75		33					
14169	31	26	20	21	17	66	180	57	44	36	36	75		33					

Cutting edge Ø (mm)	Height (mm)	Bore Ø (mm)	Z (PCS)	Surface	fz steel 700 ● (mm)	Type N		Type NR		Type NF	
						Design of cutting edges	Twist angle	Design of cutting edges	Twist angle	Design of cutting edges	Twist angle
30	30	13	6	Uncoated	0.05	Smoothing	30°	Roughing	30°	Rough finishing	30°
35	35	16	6	Uncoated	0.05	Smoothing	30°	Roughing	30°	Rough finishing	30°
40	40	16	8	Uncoated	0.08	Smoothing	30°	Roughing	30°	Rough finishing	30°
50	50	22	6	Uncoated	0.09	Smoothing	30°	Roughing	30°	Rough finishing	30°
50	50	22	8	Uncoated	0.09	Smoothing	30°	Roughing	30°	Rough finishing	30°
60	60	27	8	Uncoated	0.09	Smoothing	30°	Roughing	30°	Rough finishing	30°

Prod. Gr. 1HH

ORION® HSSE Co 5 shell end mill (Milling cutter design standard DIN 1880)



Typ **N** Typ **W** Z **6** Z **4** Z **8** Z **5** Z **10**

- Execution:** DIN 138
- Hole with longitudinal and lateral slot in line with
 - Cuts on periphery and end face



No. 14193
Type N



No. 14195
Type W

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
14193	31	26	20	21	17	66	180	57	44	36	36	75		33					
14195	31					66	180	57	44	36	36	75							

Cutting edge Ø (mm)	Bore Ø (mm)	Z (PCS)	fz steel 700 ● (mm)	Type	
				N	W
				Design of cutting edges	
				Twist angle	
				Surface	
				Uncoated	
				Uncoated	
40	16	6	0.08	14193... 140	14195... -
40	16	4	0.08	-	140
50	22	8	0.09	150	-
50	22	4	0.09	-	150
63	27	8	0.09	163	-
63	27	5	0.09	-	163
80	27	10	0.1	180	-
80	27	6	0.1	-	180

Prod. Gr. 1HH

ORION® HSSE Co 5 shell end roughing mill (Milling cutter design standard DIN 1880)



TiAlN Typ **NR** Typ **NF** Z **6** Z **8** Z **10**

- Execution:**
- **No. 14242 040-14244 080, 14248 040-14248 063:**
 - Hole with longitudinal and lateral slot in line with DIN 138
 - Cuts on periphery and end face
 - **No. 14247:**
 - Bore hole with longitudinal and lateral slot in conformity with DIN 138
 - Cutting around the circumference and on the end face



No. 14242
Type NR



No. 14244
Type NF



No. 14247
Type NR



No. 14248
Type NF

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
14242	31	26	20	21	15	66	180	57	44	36	36	75		33	11	9	9		
14244	31	26	20	21	15	66	180	57	44	36	36	75		33	11	9	9		
14247	52	43	33	25	35	110	300	60	60	95	73	125		55	18	15	15		

Milling tools monoblock \ HSSE/PM bore mill

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
14248	52	43	33	25	35	110	300	60	60	95	73	125		55	18	15	15		
Type												NR		NF		NR		NF	
Design of cutting edges												Roughing		Rough finishing		Roughing		Rough finishing	
Twist angle												25°		25°		25°		25°	
Surface												Uncoated		Uncoated		TiAlN		TiAlN	
Cutting edge Ø (mm)		Bore Ø (mm)		Z (PCS)		fz steel 700 ● (mm)		14242... Ident. No.		14244... Ident. No.		14247... Ident. No.		14248... Ident. No.					
40		16		6		0.08		040 ●		040 ●		040 ●		040 ●		040 ●			
50		22		8		0.09		050 ●		050 ●		050 ●		050 ●		050 ●			
63		27		8		0.09		063 ●		063 ●		063 ●		063 ●		063 ●			
80		27		8		0.1		080 ●		080 ●		080 ●		080 ●		080 ●			
100		32		10		0.11		-		-		-		100 ●		100 ●			

Prod. Gr. 1HH

ATORN® ORION® High-performance HSSE PM shell end mill (Milling cutter design standard DIN 1880)



HSSE-PM	TiAlN	Typ N	Z 6	Z 8	Z 10	
---------	-------	-------	-----	-----	------	--

Execution:

- Bore hole with longitudinal and lateral slot in conformity with DIN 138
- Cutting around the circumference and on the end face



No. 14989
Type N



No. 14990
Type N, TiAlN-coated

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
14989	44	32	24	26	24	78	201	66	50	37	42	84			13	10	10		
14990	73	53	40	40	43	130	335	62	70	110	83	140		63	22	17	17		

						ATORN®		ORION®	
Type						N		N	
Design of cutting edges						Smoothing		Smoothing	
Twist angle						40°		40°	
Surface						Uncoated		TiAlN	
Cutting edge Ø (mm)		Height (mm)		Bore Ø (mm)		Z (PCS)		fz steel 700 ● (mm)	
								14989... Ident. No.	
								14990... Ident. No.	
40		32		16		6		0.08	
40		32		16		8		0.08	
50		36		22		8		0.09	
63		40		27		8		0.09	
63		40		27		10		0.09	
80		45		27		10		0.1	
100		50		32		10		0.11	
								100 ●	

ORION = Prod. Gr. 1HH
ATORN® = Prod. Gr. 118

ORION® High-performance HSSE PM shell end roughing mill

(Milling cutter design standard DIN 1880)



HSSE-PM	TiAlN	Typ NR	Typ NF	Z 6	Z 8	Z 10	
---------	-------	--------	--------	-----	-----	------	--

Execution:

- Bore hole with longitudinal and lateral slot in conformity with DIN 138
- Cutting around the circumference and on the end face



No. 14991
Type NR



No. 14992
Type NF

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G)GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
14991	73	53	40	40	43	130	335	62	70	110	83	140		63	22	17	17		
14992	73	53	40	40	43	130	335	62	70	110	83	140		63	22	17	17		

Cutting edge Ø (mm)	Height (mm)	Bore Ø (mm)	Z (PCS)	fz steel 700 ● (mm)	Type	
					NR	NF
					Design of cutting edges	
					Twist angle	
					Surface	
					TiAlN	
					TiAlN	
					14991... Ident. No.	
					14992... Ident. No.	
40	32	16	6	0.08	040	●
40	32	16	8	0.08	-	●
50	36	22	8	0.09	050	●
63	40	27	8	0.09	063	●
63	40	27	10	0.09	-	●
80	45	27	10	0.1	080	●
100	50	32	10	0.11	100	●

Prod. Gr. 1HH

ORION® HSSE Co 5 single-tooth milling cutter (Milling cutter design standard Company standard)

1 cutter, uncoated

Typ W	Z 1		HA		
-------	-----	--	----	--	--

Application:

For milling, plunging and contour milling NF metals and plastics.

Execution:

- HSSE Co 5
- Straight shank pursuant to DIN 6535 HA
- Sharp-edged
- Uncoated

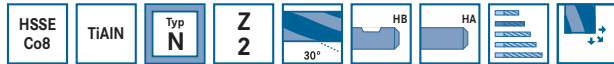


Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G)GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15007						60	186	30	35	25	32	77	30						

mm	mm	mm	mm	Z (PCS)	Type	
					Surface	W
					Tool holding device	
					fz alu ● (mm)	
					HA parallel shank	
					15007... Ident. No.	
3	12	60	8	1	0.005	030
4	12	60	8	1	0.006	040
5	13	60	8	1	0.009	050
6	14	60	8	1	0.012	060
7	14	60	8	1	0.015	070
8	14	80	8	1	0.018	080
9	14	80	9	1	0.02	090
10	14	80	10	1	0.021	100

Prod. Gr. 106

ORION HSSE Co 8 end mill (Milling cutter design standard DIN 327 B/D)
2 flutes, uncoated/TiAlN coated



Application:

No. 15013: Suitable for universal plunge, groove and clearance milling.

No. 15020-15023: Suitable for universal plunge milling, groove milling and tolerance milling.

Execution:

▪ HSSE Co 8

- **No. 15013:**
 - Finishing teeth
 - Centre cutting
 - Uncoated
 - Short version

▪ **No. 15020:** uncoated

▪ **No. 15020-15023:**

- finishing teeth
- centre cutting
- short version

▪ **No. 15023:** TiAlN coating for maximum service life



No. 15013



No. 15020



No. 15023

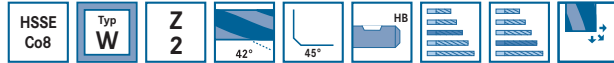
Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15013	28	23		13	17	60	186	30	35	25	32	77		28	11	11	11		
15020010-015	28	23		13	17	60	186	30	35	25	32	77		28	11	11	11		
15020020-360	28	23		13	17	60	186	30	35	25	32	77		28	11	11	11		
15023010-015	40	32		19	24	85	265	35	45	43	50	110		40	15	15	15		
15023020-360	40	32		19	24	85	265	35	45	43	50	110		40	15	15	15		

Type Surface	N			N			N		
	Uncoated			TiAlN			Uncoated		
Tool holding device	HB parallel shank			HB parallel shank			HA parallel shank		
Z (PCS)	15020... Ident. No.			15023... Ident. No.			15013... Ident. No.		
1	●	●	●	●	●	●	-	-	-
1.5	●	●	●	●	●	●	-	-	-
2	●	●	●	●	●	●	020	●	●
2.5	●	●	●	●	●	●	-	-	-
3	●	●	●	●	●	●	030	●	●
3.5	●	●	●	●	●	●	-	-	-
4	●	●	●	●	●	●	040	●	●
4.5	●	●	●	●	●	●	-	-	-
4.8	●	●	●	●	●	●	-	-	-
5	●	●	●	●	●	●	050	●	●

Type Surface	N			N			N		
	Uncoated			TiAlN			Uncoated		
Tool holding device	HB parallel shank			HB parallel shank			HA parallel shank		
Z (PCS)	15020... Ident. No.			15023... Ident. No.			15013... Ident. No.		
5.5	●	●	●	●	●	●	-	-	-
5.75	●	●	●	-	-	-	-	-	-
6	●	●	●	●	●	●	060	●	●
6.5	●	●	●	●	●	●	-	-	-
7	●	●	●	●	●	●	070	●	●
7.5	●	●	●	●	●	●	-	-	-
7.75	●	●	●	●	●	●	-	-	-
8	●	●	●	●	●	●	080	●	●
8.5	●	●	●	●	●	●	-	-	-
9	●	●	●	●	●	●	090	●	●
9.5	●	●	●	-	-	-	-	-	-
9.7	●	●	●	-	-	-	-	-	-
10	●	●	●	●	●	●	100	●	●
10.5	●	●	●	-	-	-	-	-	-
11	●	●	●	-	-	-	110	●	●
11.7	●	●	●	-	-	-	-	-	-
12	●	●	●	●	●	●	120	●	●
13	●	●	●	-	-	-	130	●	●
14	●	●	●	●	●	●	140	●	●
15	●	●	●	-	-	-	150	●	●
16	●	●	●	●	●	●	160	●	●
17	●	●	●	●	●	●	-	-	-
18	●	●	●	●	●	●	180	●	●
19	●	●	●	●	●	●	190	●	●
20	●	●	●	●	●	●	200	●	●
22	●	●	●	●	●	●	220	●	●
24	●	●	●	●	●	●	-	-	-
25	●	●	●	●	●	●	250	●	●
28	●	●	●	●	●	●	280	●	●
30	●	●	●	●	●	●	300	●	●
32	●	●	●	●	●	●	320	●	●
36	●	●	●	-	-	-	-	-	-
36	-	-	-	●	○	○	-	-	-

Prod. Gr. 106

ORION® HSSE Co 8 end mill
2-cutter, uncoated



No. 15061



No. 15063

Application:

Suitable for universal plunge milling, groove milling and tolerance milling in non-ferrous metals.

▪ straight shank in accordance with DIN 1835 B

▪ **No. 15061:**

- DIN 844 K
- standard design

▪ **No. 15063:**

- DIN 844 L
- long version

Execution:

- HSSE Co 8
- finishing teeth
- centre cutting

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15061	28			13	17	60	186	30	35	25	32	77			11				
15063	28			13	17	60	186	30	35	25	32	77			11				

					Type Surface	W	
					Tool holding device	Uncoated	Uncoated
					Z (PCS)	HB parallel shank	HB parallel shank
					fz alu ● (mm)	15061... Ident. No.	15063... Ident. No.
mm	mm	mm	mm	F mm			
2	7	51	6	0.05	2	0.008	020 ● - -
2	10	54	6	0.05	2	0.008	- - 020 ● -
3	8	52	6	0.05	2	0.01	030 ● - -
3	12	56	6	0.05	2	0.01	- - 030 ● -
4	11	55	6	0.1	2	0.01	040 ● - -
4	19	63	6	0.1	2	0.01	- - 040 ● -
5	13	57	6	0.1	2	0.017	050 ● - -
5	24	68	6	0.1	2	0.017	- - 050 ● -
6	13	57	6	0.1	2	0.024	060 ● - -
6	24	68	6	0.1	2	0.024	- - 060 ● -
7	30	80	10	0.1	2	0.03	- - 070 ● -
8	19	69	10	0.1	2	0.036	080 ● - -
8	38	88	10	0.1	2	0.036	- - 080 ● -
9	38	88	10	0.1	2	0.039	- - 090 ● -
10	22	72	10	0.2	2	0.042	100 ● - -

					Type Surface	W	
					Tool holding device	Uncoated	Uncoated
					Z (PCS)	HB parallel shank	HB parallel shank
					fz alu ● (mm)	15061... Ident. No.	15063... Ident. No.
mm	mm	mm	mm	F mm			
10	45	95	10	0.2	2	0.042	- - 100 ● -
11	22	79	12	0.2	2	0.045	110 ● - -
11	45	102	12	0.2	2	0.045	- - 110 ● -
12	26	83	12	0.2	2	0.048	120 ● - -
12	53	110	12	0.2	2	0.048	- - 120 ● -
13	26	83	12	0.2	2	0.05	130 ● - -
13	53	110	12	0.2	2	0.05	- - 130 ● -
14	26	83	12	0.2	2	0.052	140 ● - -
14	53	110	12	0.2	2	0.052	- - 140 ● -
15	53	110	12	0.2	2	0.054	- - 150 ● -
16	32	92	16	0.2	2	0.056	160 ● - -
16	63	123	16	0.2	2	0.056	- - 160 ● -
18	32	92	16	0.2	2	0.06	180 ● - -
18	63	123	16	0.2	2	0.06	- - 180 ● -
20	38	104	20	0.2	2	0.064	200 ● - -
20	75	141	20	0.2	2	0.064	- - 200 ● -

Prod. Gr. 143

ORION HSSE Co 8 end mill (Milling cutter design standard DIN 844 L)
2 flutes, uncoated/TiAIN coated



No. 15053



No. 15055

Application:

Suitable for universal plunge milling, groove milling and tolerance milling.

- finishing teeth
- centre cutting
- straight shank in accordance with DIN 1835 B
- long version
- **No. 15053:** uncoated
- **No. 15055:** TiAIN coating for maximum service life

Execution:

- HSSE Co 8

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G)GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15053	28	23		13	17	60	186	30	35	25	32	77		28	11	11	11		
15055	40	32		19	24	85	265	35	45	43	50	110		40					

mm	mm	mm	mm	Z (PCS)	Type Surface	N	
						Uncoated	TiAIN
					Tool holding device	HB parallel shank	HB parallel shank
					fz steel 700 ● (mm)	15053... Ident. No.	15055... Ident. No.
2	7	54	6	2	0.008	020	● 020 ●
3	8	56	6	2	0.01	030	● 030 ●
4	11	63	6	2	0.01	040	● 040 ●
5	13	68	6	2	0.017	050	● 050 ●
6	13	68	6	2	0.024	060	● 060 ●
7	16	80	10	2	0.03	070	● 070 ●
8	19	88	10	2	0.036	080	● 080 ●
9	19	88	10	2	0.039	090	● 090 ●
10	22	95	10	2	0.042	100	● 100 ●
11	22	102	12	2	0.045	110	● 110 ●
12	26	110	12	2	0.048	120	● 120 ●
14	26	110	12	2	0.052	140	● 140 ●
15	26	110	12	2	0.054	150	● 150 ●
16	32	123	16	2	0.056	160	● 160 ●
18	32	123	16	2	0.06	180	● 180 ●
20	38	141	20	2	0.064	200	● 200 ●
25	45	166	25	2	0.067	250	● - ●

Prod. Gr. 106

ORION® Disposable HSSE Co 8 milling cutter (Milling cutter design standard Company standard)
 3 flutes, uncoated/TiCN coated



Application:

For universal milling in all material groups. It is not financially viable to sharpen this milling cutter. It is cheaper to use the tool down to the wear limit and replace it with a new one from the factory.

Execution:

- HSSE Co 8
- straight shank in accordance with DIN 1835 B
- 3 cutters to centre
- **No. 15091:** uncoated
- **No. 15093:** TiCN coating for long service life



No. 15091



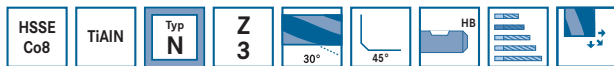
No. 15093

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15091	28	23		13	17	60	186	30	35	25	32	77		28	11	11	11		
15093	40	32		19	24	85	265	35	45	43	50	110		40	15	15	15		

mm	mm	mm	mm	Z (PCS)	Tool holding device fz steel 700 ● (mm)	Type Surface	N	N
						Uncoated	TiCN	
2	7	38	6	3	0.012	15091...	020	020
2.5	8	39	6	3	0.013	15091...	025	025
3	8	39	6	3	0.014	15091...	030	030
3.5	10	41	6	3	0.016	15091...	035	035
4	11	42	6	3	0.017	15091...	040	040
4.5	11	42	6	3	0.021	15091...	045	045
5	13	44	6	3	0.026	15091...	050	050
5.5	13	44	6	3	0.031	15091...	055	055
6	13	44	6	3	0.035	15091...	060	060
6.5	16	48	8	3	0.04	15091...	065	065
7	16	48	8	3	0.045	15091...	070	070
7.5	16	48	8	3	0.049	15091...	075	075
8	19	51	8	3	0.054	15091...	080	080
8.5	19	56	10	3	0.056	15091...	085	085
9	19	56	10	3	0.059	15091...	090	090
9.5	19	56	10	3	0.061	15091...	095	095
10	22	59	10	3	0.063	15091...	100	100

Prod. Gr. 106

ORION® HSSE Co 8 end mill (Milling cutter design standard DIN 327 B/D)
 3 flutes, uncoated/TiAlN coated



Application:

End mill for universal use when plunge milling, groove milling and keyway cutting as well as face milling and peripheral milling.

Execution:

- finishing teeth
- centre cutting
- straight shank in accordance with DIN 1835 B
- without edge protection chamfer
- **No. 15102:** uncoated
- **No. 15105:** TiAlN coating for maximum service life



No. 15102



No. 15105

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15102	28	23		13	17	60	186	30	35	25	32	77		28	11	11	11		
15105	40	32		19	24	85	265	35	45	43	50	110		40	15	15	15		

Milling tools monoblock \ HSSE/PM end mill

						Type	N		N	
						Surface	Uncoated		TiAIN	
						Tool holding device	HB parallel shank		HB parallel shank	
						fz steel 700 (mm)	15102... Ident. No.		15105... Ident. No.	
						Z (PCS)				
2	4	48	6	0.1	3	0.015	020	●	020	●
3	5	49	6	0.1	3	0.018	030	●	030	●
3.5	6	50	6	0.1	3	0.019	035	●	035	●
4	7	51	6	0.1	3	0.02	040	●	040	●
4.5	7	51	6	0.1	3	0.027	045	●	-	-
5	8	52	6	0.1	3	0.032	050	●	050	●
5.5	8	52	6	0.1	3	0.038	055	●	055	●
6	8	52	6	0.1	3	0.043	060	●	060	●
6.5	10	60	10	0.1	3	0.049	065	●	-	-
7	10	60	10	0.1	3	0.055	070	●	070	●
7.5	10	60	10	0.1	3	0.06	075	●	-	-
8	11	61	10	0.1	3	0.067	080	●	080	●
9	11	61	10	0.1	3	0.071	090	●	090	●
9.5	11	61	10	0.1	3	0.074	095	●	-	-
10	13	63	10	0.2	3	0.077	100	●	100	●
11	13	70	12	0.2	3	0.084	110	●	110	●
12	16	73	12	0.2	3	0.088	120	●	120	●
13	16	73	12	0.2	3	0.09	130	●	130	●
14	16	73	12	0.2	3	0.1	140	●	140	●
15	16	73	12	0.2	3	0.1	150	●	150	●
16	19	79	16	0.2	3	0.1	160	●	160	●
18	19	79	16	0.2	3	0.11	180	●	180	●
20	22	88	20	0.2	3	0.12	200	●	200	●
22	22	88	20	0.2	3	0.12	220	●	-	-
25	26	102	25	0.2	3	0.12	250	●	-	-
28	26	102	25	0.2	3	0.13	280	●	-	-
30	26	102	25	0.2	3	0.13	300	●	-	-
32	32	112	32	0.2	3	0.13	320	●	-	-

Prod. Gr. 106

ORION® HSSE Co 5/Co 8 end mill (Milling cutter design standard DIN 844 K) 3 flutes, uncoated/TiAIN coated



Application:

No. 15112 028–15112 250, 15118 028–15118 250: End mill for universal use when plunge milling, groove milling and keyway cutting as well as face milling and peripheral milling.

No. 15116 060–15116 200, 15119 060–15119 200: End mill for universal use in plunge milling, groove milling and keyway cutting, as well as front milling and peripheral milling.

Execution:

▪ **No. 15112:** uncoated

▪ **No. 15112 028–15112 250, 15118 028–15118 250:**

▪ HSSE Co 8

▪ centre cutting

▪ type N

▪ finishing teeth

▪ straight shank in accordance with DIN 1835 B

▪ **No. 15116:** Uncoated

▪ **No. 15116 060–15116 200, 15119 060–15119 200:**

▪ HSSE Co 5

▪ Centre cutting

▪ Type NR

▪ Roughing teeth

▪ Straight shank in accordance with DIN 1835 B

▪ **No. 15118:** TiAIN coating for maximum service life

▪ **No. 15119:** TiAIN coating for maximum service life



No. 15112



No. 15116



No. 15118



No. 15119

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plas-tics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15112	28	23		13	17	60	186	30	35	25	32	77		28	11	11	11		
15116	28	23		13	17	60	186	30	35	25	32	77		28	11	11	11		
15118	40	32		19	24	85	265	35	45	43	50	110		40	15	15	15		
15119	40	32		19	24	85	265	35	45	43	50	110		40	15	15	15		

						Type	N		NR		N		NR	
						Surface	Uncoated		Uncoated		TiAIN		TiAIN	
						Tool holding device	HB parallel shank		HB parallel shank		HB parallel shank		HB parallel shank	
						Z (PCS)	15112... Ident. No.		15116... Ident. No.		15118... Ident. No.		15119... Ident. No.	
						Z (PCS)								
2.8	8	52	6	0.1	3	0.014	028	●	-	-	028	●	-	-
3	8	52	6	0.1	3	0.014	030	●	-	-	030	●	-	-
3.8	11	55	6	0.1	3	0.016	038	●	-	-	038	●	-	-
4	11	55	6	0.1	3	0.017	040	●	-	-	040	●	-	-
4.8	13	57	6	0.1	3	0.024	048	●	-	-	048	●	-	-
5	13	57	6	0.1	3	0.026	050	●	-	-	050	●	-	-
5.75	13	57	6	0.1	3	0.033	057	●	-	-	057	●	-	-
6	13	57	6	0.1	3	0.035	060	●	060	●	060	●	060	●
6.75	16	66	10	0.1	3	0.042	067	●	-	-	067	●	-	-
7	16	66	10	0.1	3	0.045	070	●	-	-	070	●	-	-
7.75	19	69	10	0.1	3	0.052	077	●	-	-	077	●	-	-
8	19	69	10	0.1	3	0.054	080	●	080	●	080	●	080	●



					Type	N		NR		N		NR		
					Surface	Uncoated		Uncoated		TiAlN		TiAlN		
					Tool holding device		HB parallel shank		HB parallel shank		HB parallel shank		HB parallel shank	
					Z (PCS)	fz steel 700 (mm)	15112... Ident. No.		15116... Ident. No.		15118... Ident. No.		15119... Ident. No.	
					3	0.062	097	●	-	-	097	●	-	-
10	22	72	10	0.1	3	0.063	100	●	100	●	100	●	100	●
12	26	83	12	0.2	3	0.072	120	●	120	●	120	●	120	●
14	26	83	12	0.2	3	0.078	140	●	140	●	140	●	140	●
16	32	92	16	0.2	3	0.084	160	●	160	●	160	●	160	●
18	32	92	16	0.2	3	0.09	180	●	180	●	180	●	180	●
20	38	104	20	0.2	3	0.096	200	●	200	●	200	●	200	●
25	45	121	25	0.2	3	0.101	250	●	-	-	250	●	-	-

Prod. Gr. 106

ORION® HSSE Co 8 end mill (Milling cutter design standard DIN 844 K)
3 flutes, TiAlN coated



Application:

The high twist angle of 40° with reduced deflection forces during contour milling ensures smoother running and improved surface quality when finishing; not suitable for keyways.

Execution:

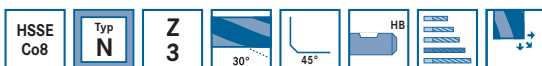
- HSSE Co 8
- finishing teeth
- centre cutting
- TiAlN coating for maximum service life
- straight shank in accordance with DIN 1835 B

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15215	40	32	18	24	19	85	265	43	50	35	45	110		40	15	15	15		

					Type	N		
					Surface	Uncoated		
					Tool holding device		HB parallel shank	
					Z (PCS)	fz steel 700 (mm)	15215... Ident. No.	
					3	0.035	060	●
8	19	69	10	0.1	3	0.054	080	●
10	22	72	10	0.1	3	0.063	100	●
12	26	83	12	0.2	3	0.072	120	●
16	32	92	16	0.2	3	0.084	160	●
20	38	104	20	0.2	3	0.096	200	●
25	45	121	25	0.2	3	0.101	250	●

Prod. Gr. 106

ORION® HSSE Co 8 end mill (Milling cutter design standard DIN 844 L)
3-cutter, uncoated



Application:

End mill for universal use when plunge milling, groove milling and keyway cutting as well as face milling and peripheral milling.






Execution:

- HSSE Co 8
- finishing teeth
- centre cutting
- straight shank in accordance with DIN 1835 B

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15124	28	23		17	13	60	186	30	35	25	32	77		28	11	11	11		

					Type	N		
					Surface	Uncoated		
					Tool holding device		HB parallel shank	
					Z (PCS)	fz steel 700 (mm)	15124... Ident. No.	
					3	0.014	030	●
4	19	63	6	0.1	3	0.017	040	●
5	24	68	6	0.1	3	0.026	050	●
6	24	68	6	0.1	3	0.035	060	●
7	30	80	10	0.1	3	0.045	070	●
8	38	88	10	0.1	3	0.054	080	●
9	38	88	10	0.1	3	0.059	090	●
10	45	95	10	0.1	3	0.063	100	●
12	53	110	12	0.2	3	0.072	120	●
14	53	110	12	0.2	3	0.078	140	●
16	63	123	16	0.2	3	0.084	160	●

Milling tools monoblock \ HSSE/PM end mill

					Type	N
					Surface	Uncoated
					Tool holding device	HB parallel shank
					fz steel 700 (mm)	15124... Ident. No.
					Z (PCS)	
18	63	123	16	0.2	3	0.09
20	75	141	20	0.2	3	0.096
22	75	141	20	0.2	3	0.098
25	90	166	25	0.2	3	0.101

Prod. Gr. 106

ATORN® ORION® End mill, HSSE-PM (Milling cutter design standard DIN 844 B) 3 flutes, TiAlN coated



Application:

Universal end mill for plunge, groove and slot milling as well as for face and circumferential milling. Optimized cutting material for unstable clamping conditions and increased service life. Also suitable for milling with compressed air.

Execution:

- HSSE PM
- Centre cutting
- Straight shank pursuant to DIN 1835 HB
- TiAlN-coating for maximum service life
- No. 15159: Roughing teeth
- No. 15901: Finishing teeth








No. 15159



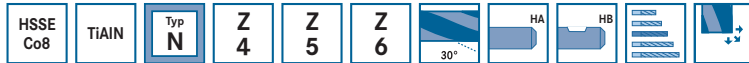
No. 15901

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15159	78	51	35	43	43	130	325	70	70	110	85	140		75	23	23	20		
15901	78	51	35	43	40	130	325	110	85	70	70	140		75	23	23	20		

							ATORN®		ORION®	
					Type	NR	N			
					Surface	TiAlN	TiAlN			
					Tool holding device	HB parallel shank	HB parallel shank			
					fz steel 700 (mm)	15159... Ident. No.	15901... Ident. No.			
					Z (PCS)					
6	13	57	6	0.1	3	0.057	060	060		
8	19	69	10	0.1	3	0.078	080	080		
10	22	72	10	0.1	3	0.093	100	100		
12	26	83	12	0.2	3	0.108	120	120		
14	26	83	12	0.2	3	0.115	140	-		
16	32	92	16	0.2	3	0.12	160	160		
18	32	92	16	0.2	3	0.13	180	-		
20	38	104	20	0.2	3	0.145	200	200		

ORION = Prod. Gr. 106
ATORN = Prod. Gr. 118

ORION® HSSE Co 8 end mill (Milling cutter design standard DIN 844 K)
4-6 flutes, uncoated/TiAlN coated



Application:
End mill for universal machining in a wide range of materials.

Execution:
 ▪ HSSE Co 8
 ▪ finishing teeth

- centre cutting
- without edge protection chamfer
- **No. 15170:** straight shank in accordance with DIN 1835 A
- **No. 15170–15176:** uncoated
- **No. 15176–15178:** straight shank in accordance with DIN 1835 B
- **No. 15178:** TiAlN coating for maximum service life



No. 15170



No. 15176



No. 15178

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15170	28	23	12	17	17	60	186	30	32	25	35	77		28	11	11	11		
15176	28	23	12	17	17	60	186	30	32	25	35	77		28	11	11	11		
15178	40	32	18	19	24	85	265	35	45	43	50	110		40	15	15	15		

				Type Surface		N Uncoated		N Uncoated		N TiAlN	
				Tool holding device		HA parallel shank		HB parallel shank		HB parallel shank	
				Z (PCS)	fz steel 700 (mm)	15170... Ident. No.		15176... Ident. No.		15178... Ident. No.	
mm	mm	mm	mm								
2	7	51	6	4	0.012	020	●	020	●	020	●
2.5	8	52	6	4	0.014	025	●	025	●	025	●
3	8	52	6	4	0.014	030	●	030	●	030	●
3.5	10	54	6	4	0.016	-	-	035	●	035	●
4	11	55	6	4	0.017	040	●	040	●	040	●
4.5	11	55	6	4	0.022	-	-	045	●	045	●
5	13	57	6	4	0.026	050	●	050	●	050	●
5.5	13	57	6	4	0.031	-	-	055	●	055	●
6	13	57	6	4	0.035	060	●	060	●	060	●
6.5	16	66	10	4	0.04	-	-	065	●	065	●
7	16	66	10	4	0.045	070	●	070	●	070	●
7.5	16	66	10	4	0.05	-	-	075	●	075	●
8	19	69	10	4	0.054	080	●	080	●	080	●
8.5	19	69	10	4	0.056	-	-	085	●	085	●
9	19	69	10	4	0.059	090	●	090	●	090	●
9.5	19	69	10	4	0.061	-	-	095	●	095	●
10	22	72	10	4	0.063	100	●	100	●	100	●
11	22	79	12	4	0.068	110	●	110	●	110	●
12	26	83	12	4	0.072	120	●	120	●	120	●
13	26	83	12	4	0.075	130	●	130	●	130	●
14	26	83	12	4	0.078	140	●	140	●	140	●
15	26	83	12	4	0.081	150	●	150	●	150	●
16	32	92	16	4	0.086	160	●	160	●	160	●
17	32	92	16	4	0.086	170	●	170	●	170	●
18	32	92	16	4	0.09	180	●	180	●	180	●
20	38	104	20	4	0.1	200	●	200	●	200	●
22	38	104	20	5	0.12	220	●	220	●	220	●
24	45	121	25	5	0.12	-	-	240	●	240	●
25	45	121	25	5	0.13	250	●	250	●	250	●
28	45	121	25	5	0.13	280	●	280	●	280	●
30	45	121	25	5	0.13	300	●	300	●	300	●
32	53	133	32	6	0.17	320	●	320	●	320	●
35	53	133	32	6	0.17	-	-	350	●	350	●
36	53	133	32	6	0.17	-	-	360	●	360	●
40	63	155	40	6	0.18	-	-	400	●	400	●

Prod. Gr. 106

ORION HSSE Co 8/HSSE PM end mill (Milling cutter design standard DIN 844 L) 4-6 flutes, uncoated/TiAlN coated



Application:

End mill for universal machining in a wide range of materials.

Execution:

- No. 15193: uncoated
- No. 15193-15195:
 - HSSE Co 8
 - finishing teeth
 - centre cutting
 - straight shank DIN 1835 B

- 40° twist angle
- No. 15195: TiAlN coating for maximum service life
- No. 15904:
 - HSSE PM - optimized cutting material for unstable clamping conditions and increased service life
 - Finishing teeth
 - Centre cutting
 - TiAlN-coating for maximum service life
 - Straight shank DIN 1835 B
 - Twist angle 30°



No. 15193

No. 15195

No. 15904

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)/FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15193	28	23	12	17	13	60	186	30	35	25	32	77		28	11	11	11		
15195	40	32	18	19	24	85	265	35	45	43	50	110		40	15	15	15		
15904	78	51	35	43	37	130	325	110	85	70	70	140		75	23	23	20		

Type Surface	N Uncoated			N TiAlN		N TiAlN													
	HB parallel shank	HB parallel shank	HB parallel shank	HB parallel shank	HB parallel shank	HB parallel shank	HB parallel shank												
Tool holding device	15193... Ident. No.		15195... Ident. No.		15904... Ident. No.														
mm	mm	mm	mm	F _z mm	Z (PCS)	fz steel 700 ● (mm)													
3	12	56	6	0.1	4	0.013	030	●	030	●	-	-	-	-	-	-	-	-	-
4	19	63	6	0.1	4	0.015	040	●	040	●	-	-	-	-	-	-	-	-	-
5	24	68	6	0.1	4	0.025	050	●	050	●	-	-	-	-	-	-	-	-	-
6	24	68	6	0.1	4	0.033	060	●	060	●	-	-	-	-	-	-	-	-	-
8	38	88	10	0.1	4	0.05	080	●	080	●	-	-	-	-	-	-	-	-	-
10	45	95	10	0.1	4	0.059	100	●	100	●	-	-	-	-	-	-	-	-	-
12	53	110	12	0.2	4	0.067	120	●	120	●	-	-	-	-	-	-	-	-	-
14	53	110	12	0.2	4	0.073	140	●	140	●	-	-	-	-	-	-	-	-	-
16	63	123	16	0.2	4	0.081	160	●	160	●	-	-	-	-	-	-	-	-	-
18	63	123	16	0.2	4	0.084	180	●	180	●	-	-	-	-	-	-	-	-	-
20	75	141	20	0.2	4	0.09	200	●	200	●	-	-	-	-	-	-	-	-	-
22	75	141	20	0.2	5	0.11	220	●	220	●	-	-	-	-	-	-	-	-	-
25	90	166	25	0.2	5	0.12	250	●	250	●	-	-	-	-	-	-	-	-	-
28	90	166	25	0.2	5	0.12	280	●	280	●	-	-	-	-	-	-	-	-	-
30	90	166	25	0.2	5	0.12	300	●	300	●	-	-	-	-	-	-	-	-	-
32	106	186	32	0.2	6	0.15	320	●	320	●	-	-	-	-	-	-	-	-	-
6	24	68	6	0.1	4	0.053	-	-	-	-	060	●	-	-	-	-	-	-	-
8	38	88	10	0.1	4	0.073	-	-	-	-	080	●	-	-	-	-	-	-	-
10	45	95	10	0.1	4	0.088	-	-	-	-	100	●	-	-	-	-	-	-	-
12	53	110	12	0.2	4	0.1	-	-	-	-	120	●	-	-	-	-	-	-	-
16	63	123	16	0.2	4	0.11	-	-	-	-	160	●	-	-	-	-	-	-	-
20	75	141	20	0.2	4	0.13	-	-	-	-	200	●	-	-	-	-	-	-	-

Prod. Gr. 106

ORION HSSE Co 5 end mill (Milling cutter design standard Company standard) 4-6 flutes, uncoated



Application:

No. 15324: End mill for universal machining in diverse materials.

No. 15325: End mill for universal machining in a wide range of materials.

Execution:

- HSSE Co 5

- No. 15324:
 - Straight shank in accordance with DIN 1835 B
 - Type N
 - Finishing teeth
- No. 15325:
 - straight shank in accordance with DIN 1835 B
 - type NR
 - roughing teeth



No. 15324



No. 15325

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)/FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15324	28	23	12	17	13	60	186	30	35	25	32	77		28	11	11	11		
15325	28	23	12	13	17	60	186	25	32	30	35	77		28	11	11	11		



					Type	N		NR		
					Surface	Uncoated		Uncoated		
					Tool holding device	HB parallel shank		HB parallel shank		
					Z (PCS)	fz steel 700 (mm)	15324... Ident. No.		15325... Ident. No.	
10	60	110	10	0.1	4	0.06	100	●	-	-
12	80	137	12	0.2	4	0.067	120	●	-	-
14	80	137	12	0.2	4	0.074	140	●	140	●
16	100	160	16	0.2	4	0.081	160	●	160	●
18	100	160	16	0.2	5	0.11	180	●	-	-
18	100	160	16	0.2	4	0.11	-	-	180	●
20	125	191	20	0.2	5	0.11	200	●	-	-
20	125	191	20	0.2	4	0.11	-	-	200	●
22	110	180	20	0.2	5	0.12	220	●	220	●
25	140	216	25	0.2	6	0.13	250	●	-	-
25	140	216	25	0.2	5	0.13	-	-	250	●
28	140	205	25	0.2	6	0.13	280	●	-	-
28	140	205	25	0.2	5	0.13	-	-	280	●
30	140	205	25	0.2	6	0.14	300	●	-	-
30	140	205	25	0.2	5	0.14	-	-	300	●
32	180	260	32	0.2	6	0.14	320	●	320	●

Prod. Gr. 106

ATORN® ORION® HSSE PM end mill (Milling cutter design standard DIN 844 K)
4-6 flutes, TiAlN coated



Application:

No. 15188: End mill for universal machining in a wide range of materials. Optimised cutting material for unstable clamping conditions and increased service life.

No. 15902: End mill for universal machining in a wide range of materials. Optimized cutting material for unstable clamping conditions and increased service life.

Execution:

- HSSE PM

No. 15188:

- finishing teeth
- centre cutting
- TiAlN coating for maximum service life
- straight shank in accordance with DIN 1835 B
- also for dry milling using compressed air

No. 15902:

- Finishing teeth
- Centre cutting
- TiAlN-coating for maximum service life
- Straight shank according to DIN 1835 B
- Also for dry milling with compressed air



No. 15188



No. 15902

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15188	78	51	35	43	38	130	325	110	85	70	70	140		75	23	23	20		
15902	78	51	35	43	43	130	325	70	70	110	85	140		75	23	23	20		

					Type	N		N		
					Surface	TiAlN		TiAlN		
					Tool holding device	HB parallel shank		HB parallel shank		
					Z (PCS)	fz steel 700 (mm)	15188... Ident. No.		15902... Ident. No.	
2	7	51	6	0.1	4	0.011	020	●	-	-
3	8	52	6	0.1	4	0.022	030	●	-	-
4	11	55	6	0.1	4	0.034	040	●	-	-
5	13	57	6	0.1	4	0.043	050	●	-	-
6	13	57	6	0.1	4	0.053	060	●	060	●
7	16	66	10	0.1	4	0.063	070	●	-	-
8	19	69	10	0.1	4	0.073	080	●	080	●
10	22	72	10	0.1	4	0.09	100	●	100	●
12	26	83	12	0.2	4	0.1	120	●	120	●
14	26	83	12	0.2	4	0.11	140	●	-	-
16	32	92	16	0.2	4	0.11	160	●	160	●
18	32	92	16	0.2	4	0.12	180	●	-	-
20	38	104	20	0.2	4	0.13	200	●	200	●
25	45	121	25	0.2	6	0.15	250	●	-	-
32	53	133	32	0.2	6	0.16	320	●	-	-

ORION = Prod. Gr. 106
ATORN® = Prod. Gr. 118

ORION® HSSE Co 5 roughing cutter (Milling cutter design standard DIN 844



K)

4-6 flutes, uncoated/TiAlN coated



Application:

No. 15261: Roughing cutter for universal machining in diverse materials.

No. 15263: Roughing cutter for universal machining.

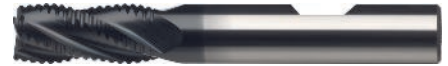
Execution:

▪ HSSE Co 5

- Roughing teeth
- Centre cutting
- Straight shank in accordance with DIN 1835 B
- **No. 15261:** Uncoated
- **No. 15263:** TiAlN coating for maximum service life



No. 15261



No. 15263

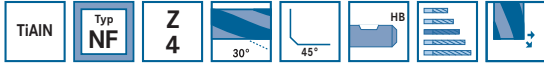
Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15261	28	23	12	17	13	60	186	30	35	25	32	77		28	11	11	11		
15263	40	32	18	19	24	85	265	35	45	43	50	110		40	15	15	15		

					Type Surface	Tool holding device		NR		NR		
					Uncoated	HB parallel shank		Uncoated		TiAlN		
					Ident. No.	15261...		15261...		15263...		
					Ident. No.	Ident. No.		Ident. No.		Ident. No.		
					Z (PCS)	fz steel 700 (mm)	4	0.033	060	●	060	●
6	13	57	6	0.1	4	0.033	4	0.033	060	●	060	●
7	16	66	10	0.1	4	0.042	4	0.042	070	●	070	●
8	19	69	10	0.1	4	0.05	4	0.05	080	●	080	●

					Type Surface	Tool holding device		NR		NR		
					Uncoated	HB parallel shank		Uncoated		TiAlN		
					Ident. No.	15261...		15261...		15263...		
					Ident. No.	Ident. No.		Ident. No.		Ident. No.		
					Z (PCS)	fz steel 700 (mm)	4	0.055	090	●	090	●
9	19	69	10	0.1	4	0.055	4	0.055	090	●	090	●
10	22	72	10	0.1	4	0.059	4	0.059	100	●	100	●
11	22	79	12	0.2	4	0.063	4	0.063	110	●	110	●
12	26	83	12	0.2	4	0.067	4	0.067	120	●	120	●
14	26	83	12	0.2	4	0.073	4	0.073	140	●	140	●
16	32	92	16	0.2	4	0.081	4	0.081	160	●	160	●
18	32	92	16	0.2	4	0.084	4	0.084	180	●	180	●
20	38	104	20	0.2	4	0.09	4	0.09	200	●	200	●
22	38	104	20	0.2	4	0.09	4	0.09	220	●	220	●
25	45	121	25	0.2	4	0.09	4	0.09	250	●	250	●
28	45	121	25	0.2	5	0.12	5	0.12	280	●	280	●
30	45	121	25	0.2	5	0.12	5	0.12	300	●	300	●
32	53	133	32	0.2	6	0.15	6	0.15	320	●	320	●

Prod. Gr. 106

ORION® HSSE Co 5 roughing cutter (Milling cutter design standard DIN 844 K)
4 flutes, uncoated/TiAlN coated



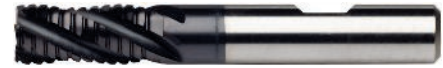
Application:
Roughing cutter for universal machining.

Execution:
▪ HSSE Co 5

- rough finishing teeth
- centre cutting
- straight shank in accordance with DIN 1835 B
- **No. 15278:** uncoated
- **No. 15280:** TiAlN coating for maximum service life



No. 15278
Uncoated



No. 15280

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GJMw	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15278	28	23	12	17	12	60	186	30	35	25	32	77		28	11	11	11		
15280	40	32	18	19	24	85	265	35	45	43	50	110		40	15	15	15		

						Type Surface	NF		NF	
						Tool holding device	Uncoated		TiAlN	
						Z (PCS)	HB parallel shank	15278...		15280...
						fz steel 700 (mm)	Ident. No.		Ident. No.	
mm	mm	mm	mm	mm	F _z mm					
6	13	57	6	0.1	4	0.033	060	●	060	●
7	16	66	10	0.1	4	0.042	070	●	070	●
8	19	69	10	0.1	4	0.05	080	●	080	●
9	19	69	10	0.1	4	0.055	090	●	090	●
10	22	72	10	0.1	4	0.059	100	●	100	●
11	22	79	12	0.2	4	0.063	110	●	110	●
12	26	83	12	0.2	4	0.067	120	●	120	●
14	26	83	12	0.2	4	0.073	140	●	140	●
16	32	92	16	0.2	4	0.081	160	●	160	●
18	32	92	16	0.2	4	0.084	180	●	180	●
20	38	104	20	0.2	4	0.09	200	●	200	●
22	38	104	20	0.2	4	0.09	220	●	220	●
25	45	121	25	0.2	4	0.09	250	●	250	●
30	45	121	25	0.2	4	0.1	300	●	300	●
32	53	133	32	0.2	4	0.1	320	●	-	-
28	45	121	25	0.2	4	0.1	-	-	280	●

Prod. Gr. 106

ORION® HSSE Co 5 roughing cutter (Milling cutter design standard DIN 844 L)
4-6 flutes, uncoated/TiAlN coated



Application:
Roughing cutter for universal machining.

Execution:
▪ HSSE Co 5
▪ centre cutting

- straight shank in accordance with DIN 1835 B
- type NR
- roughing teeth
- **No. 15272:** uncoated
- **No. 15275:** TiAlN coating for maximum service life



No. 15272



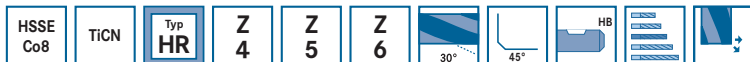
No. 15275

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GJMw	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15272	28	23	12	17	12	60	186	30	35	25	32	77		28	11	11	11		
15275	40	32	18	19	24	85	265	35	45	43	50	110		40	15	15	15		

						Type Surface	NR		NR	
						Tool holding device	Uncoated		TiAlN	
						Z (PCS)	HB parallel shank	15272...		15275...
						fz steel 700 (mm)	Ident. No.		Ident. No.	
mm	mm	mm	mm	mm	F _z mm					
6	24	68	6	0.1	4	0.033	060	●	060	●
8	38	88	10	0.1	4	0.05	080	●	080	●
10	45	95	10	0.1	4	0.059	100	●	100	●
12	53	110	12	0.2	4	0.067	120	●	120	●
14	53	110	12	0.2	4	0.073	140	●	140	●
16	63	123	16	0.2	4	0.081	160	●	160	●
18	63	123	16	0.2	4	0.084	180	●	180	●
20	75	141	20	0.2	4	0.09	200	●	200	●
25	90	166	25	0.2	4	0.09	250	●	250	●
30	90	166	25	0.2	4	0.1	300	●	300	●
32	106	186	32	0.2	4	0.1	320	●	320	●

Prod. Gr. 106

ORION® HSSE Co 8 roughing cutter (Milling cutter design standard DIN 844 K)
4 flutes, TiCN coated



Application:

Roughing cutter for universal machining.

- centre cutting (over dia. 20 mm without centre cutting)

Execution:

- HSSE Co 8

- fine roughing teeth

- TiCN coating for maximum service life requirements

- straight shank in accordance with DIN 1835 B

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15290	40	32	18	24	19	85		50		45				40	15	15	15		

D mm	D mm	D mm	D mm	F mm	Z (PCS)	Tool holding device fz steel 1300 (mm)	Type Surface	HR
							HR	TiCN
							HB parallel shank	15290... Ident. No.
6	13	57	6	0.1	4	0.038	060	●
7	16	66	10	0.1	4	0.048	070	●
8	19	69	10	0.1	4	0.058	080	●
9	19	69	10	0.1	4	0.062	090	●
10	22	72	10	0.1	4	0.068	100	●
11	22	79	12	0.2	4	0.072	110	●
12	26	83	12	0.2	4	0.076	120	●
13	26	83	12	0.2	4	0.08	130	●
14	26	83	12	0.2	4	0.084	140	●
15	26	83	12	0.2	4	0.088	150	●
16	32	92	16	0.2	4	0.09	160	●
17	32	92	16	0.2	4	0.09	170	●
18	32	92	16	0.2	4	0.1	180	●
20	38	104	20	0.2	4	0.1	200	●
22	38	104	20	0.2	4	0.1	220	●
25	45	121	25	0.2	5	0.12	250	●
30	45	121	25	0.2	6	0.14	300	●

Prod. Gr. 106

ORION® HSSE Co 8 roughing cutter (Milling cutter design standard DIN 844 L)
4 flutes, TiCN coated



Application:

End mill for universal use when plunge milling, groove milling and keyway cutting as well as face milling and peripheral milling.

- fine roughing teeth
- centre cutting (over diameter 20 mm without centre cutting)
- TiCN coating for long service life
- straight shank in accordance with DIN 1835 B

Execution:

- HSSE Co 8

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15300	40	32	18	24	19	85		50		45				40	15	15	15		

Diameter (mm)	Length (mm)	Diameter (mm)	Length (mm)	Diameter (mm)	Length (mm)	Diameter (mm)	Length (mm)	Diameter (mm)	Length (mm)	Diameter (mm)	Length (mm)	Fz (mm)	Z (PCS)	fz steel 1300 (mm)	Type	HR
															Surface	TiCN
															Tool holding device	HB parallel shank
6	24	68	6	0.1	3	0.025	060	•								
7	30	80	10	0.1	3	0.031	070	•								
8	38	88	10	0.1	3	0.038	080	•								
9	38	88	10	0.1	3	0.04	090	•								
10	45	95	10	0.1	4	0.06	100	•								
11	45	102	12	0.2	4	0.063	110	•								
12	53	110	12	0.2	4	0.067	120	•								
13	53	110	12	0.2	4	0.07	130	•								
14	53	110	12	0.2	4	0.074	140	•								
15	53	110	12	0.2	4	0.077	150	•								
16	63	123	16	0.2	4	0.081	160	•								
17	63	123	16	0.2	4	0.081	170	•								
18	63	123	16	0.2	4	0.084	180	•								
20	75	141	20	0.2	4	0.09	200	•								
22	75	141	20	0.2	5	0.12	220	•								
24	90	166	25	0.2	5	0.12	240	•								
25	90	166	25	0.2	5	0.12	250	•								
26	90	166	25	0.2	6	0.11	260	•								
28	90	166	25	0.2	6	0.12	280	•								
30	90	166	25	0.2	6	0.13	300	•								

Prod. Gr. 106

ATORN® ORION® HSSE PM roughing cutter (Milling cutter design standard DIN 844 K)
4-6 flutes, TiAlN coated



Application:

Roughing cutter for universal machining in a wide range of materials.

- Type NRF
- Fine roughing teeth
- **No. 15905:**
 - Type NR
 - Roughing teeth
- **No. 15907:**
 - Type NF
 - Roughing and finishing teeth

Execution:

- HSSE PM
- TiAlN-coating for maximum service life
- Straight shank according to DIN 1835 B
- **No. 15269:**



No. 15269



No. 15905



No. 15907

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15269	78	51	35	43	37	130	325	110	85	70	70	140		75	23	23	20		
15905	78	51	35	43	43	130	325	70	70	110	85	140		75	23	23	20		
15907	78	51	35	43	43	130	325	70	70	110	85	140		75	23	23	20		

Diameter (mm)	Length (mm)	Diameter (mm)	Length (mm)	Diameter (mm)	Length (mm)	Diameter (mm)	Length (mm)	Diameter (mm)	Length (mm)	Diameter (mm)	Length (mm)	Fz (mm)	Z (PCS)	fz steel 700 (mm)	ATORN®		ORION®	
															Type	Surface	NR	TiAlN
															Tool holding device	HB parallel shank	HB parallel shank	HB parallel shank
6	13	57	6	0.1	4	0.038	060	•	060	•	060	•	060	•				
8	19	69	10	0.1	4	0.052	080	•	080	•	080	•	080	•				
10	22	72	10	0.1	5	0.078	100	•	100	•	100	•	100	•				
12	26	83	12	0.2	5	0.09	120	•	120	•	120	•	120	•				

Milling tools monoblock \ HSSE/PM end mill

							ATORN®		ORION®		
							Type Surface	NRF	NR	NF	
							Tool holding device	TiAlN	TiAlN	TiAlN	
							HB parallel shank	HB parallel shank	HB parallel shank	HB parallel shank	
							fz steel 700 ● (mm)	15269... Ident. No.	15905... Ident. No.	15907... Ident. No.	
							Z (PCS)				
14	26	83	12	16	20	25	5	0.1	140	●	-
16	32	92	16	16	20	25	5	0.1	160	●	160
18	32	92	16	16	20	25	5	0.11	180	●	-
20	38	104	20	20	20	25	5	0.12	200	●	200
25	45	121	25	25	20	25	5	0.13	250	●	-
32	53	133	32	32	20	25	6	0.18	320	●	-

ORION = Prod. Gr. 106
 ATORN = Prod. Gr. 118

ORION® HSSE PM roughing cutter (Milling cutter design standard DIN 844 L) 4-6 flutes, TiAlN coated



HSSE-PM
TiAlN
Typ NR
Typ NF
Z 4
Z 5
Z 6
30°
45°
HB

Application:
 Roughing cutter for universal machining.

- Centre cutting
- TiAlN-coating for maximum service life
- Straight shank according to DIN 1835 B
- No. 15906: Type NR
- No. 15908: Type NF

- Execution:**
- HSSE PM
 - Roughing teeth



No. 15906



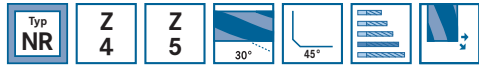
No. 15908

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G)GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15906	78	51	35	43	43	130	325	110	85	70	70	140		75	23	23	20		
15908	78	51	35	43	43	130	325	70	70	110	85	140		75	23	23	20		

							Type Surface	NR	NF		
							Tool holding device	TiAlN	TiAlN		
							HB parallel shank	HB parallel shank	HB parallel shank		
							fz steel 700 ● (mm)	15906... Ident. No.	15908... Ident. No.		
							Z (PCS)				
6	24	68	6	10	12	16	4	0.049	060	●	060
8	38	88	10	10	12	16	4	0.068	080	●	080
10	45	95	10	10	12	16	4	0.081	100	●	100
12	53	110	12	12	12	16	4	0.094	120	●	120
14	53	110	12	12	12	16	4	0.1	140	●	-
16	63	123	16	16	12	16	4	0.1	160	●	160
18	63	123	16	16	12	16	4	0.11	180	●	-
20	75	141	20	20	12	16	4	0.12	200	●	200
25	90	166	25	25	12	16	5	0.13	250	●	-
32	106	186	32	32	12	16	6	0.15	320	●	-

Prod. Gr. 106

ORION® HSSE Co 5 end mill (Milling cutter design standard DIN 844 L)
4-5 flutes, uncoated



- Application:**
End mill for universal machining in diverse materials.
- Centre cutting
 - Straight shank in accordance with DIN 1835 D
- Execution:**
- HSSE Co 5
 - Type NR
 - Roughing teeth

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15242	28	23	12	13	17	60	186	25	32	30	35	77		28	11	11	11		

							Type Surface	NR
							Tool holding device	Uncoated
							Z (PCS)	HD parallel shank
							fz steel 700 (mm)	15242... Ident. No.
mm	mm	mm	mm	mm	F mm			
6	24	68	6	0.1	4	0.033	060	●
8	38	88	10	0.1	4	0.05	080	●
10	45	95	10	0.1	4	0.059	100	●
12	53	110	12	0.2	4	0.067	120	●
14	53	110	12	0.2	4	0.073	140	●
16	63	123	16	0.2	4	0.081	160	●
18	63	123	16	0.2	4	0.084	180	●
20	75	141	20	0.2	4	0.09	200	●
25	90	166	25	0.2	4	0.09	250	●
30	90	166	25	0.2	5	0.12	300	●

Prod. Gr. 106

ORION® HSSE Co 5 end mill (Milling cutter design standard DIN 845 B/C)
4-6 flutes, uncoated



No. 15350



No. 15351

- Application:**
End mill for universal machining.
- Type N
 - Finishing teeth
 - Twist angle 30°
- Execution:**
- HSSE Co 5
 - No. 15350:
 - With Morse taper and internal draw-in thread (from Morse taper 4 with collar and driving surface in accordance with DIN 2207).
 - No. 15351:
 - type NR
 - roughing teeth
 - 25° twist angle

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15350	28	23	12	17	13	60	186	30	35	28	30	77		28	11	11	11		
15351	●	●	○	○	○	○	○	○	○	○	○	○		○	○	○	○		

							Type Surface	N	NR		
							Tool holding device	Uncoated	Uncoated		
							Morse taper size	Morse taper shank	Morse taper shank		
							Female thread (mm)	fz steel 700 (mm)	15350... Ident. No.	15351... Ident. No.	
mm	mm	mm	F mm								
10	22	92	0.1	MK 1	6	4	0.03	100	●	-	-
16	32	117	0.2	MK 2	10	4	0.05	160	●	160	●
18	32	117	0.2	MK 2	10	4	0.05	180	●	180	●
20	38	123	0.2	MK 2	10	4	0.05	200	●	200	●
22	38	123	0.2	MK 2	10	6	0.08	220	●	220	●
24	45	147	0.2	MK 3	12	6	0.08	240	●	240	●
25	45	147	0.2	MK 3	12	6	0.08	250	●	250	●
28	45	147	0.2	MK 3	12	6	0.08	280	●	280	●
30	45	147	0.2	MK 3	12	6	0.08	300	●	300	●
32	53	201	0.2	MK 4	16	6	0.09	320	●	320	●

Prod. Gr. 106

ORION® HSSE Co 8 end mill (Milling cutter design standard Company standard)
6-8 flutes, uncoated/TiCN+TiN coated



HSSE Co8	TiCN/TiN	Typ N	Z 6	Z 8					
----------	----------	-------	-----	-----	--	--	--	--	--

Application:
End mill for universal machining.

Execution:
 ▪ HSSE Co 8
 ▪ Finishing teeth

- Without centre cutting
- Straight shank in accordance with DIN 1835 B
- **No. 15251:** Uncoated
- **No. 15252:** TiCN + TiN-coating for maximum service life



No. 15251



No. 15252

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15251	28	23	12	17	13	60	186	30	35	25	32	77		28	11	11	11		
15252	40	32	18	19	24	85	265	35	45	43	50	110		40	15	15	15		

mm	mm	mm	mm	mm	F mm	Z (PCS)	Tool holding device fz steel 700 (mm)	Type Surface	N Uncoated	N TiCN/TiN
								HB parallel shank	HB parallel shank	
30	30	90	20	0.2	6	0.08	030	●	030	●
35	30	90	20	0.2	6	0.09	035	●	035	●
40	32	95	25	0.2	8	0.13	040	●	040	●
50	36	100	32	0.2	8	0.14	050	●	050	●

Prod. Gr. 106

ORION® HSSE Co 5 roughing cutter (Milling cutter design standard Company standard)
6-8 flutes, uncoated/TiCN+TiN coated



TiCN/TiN	Typ NR	Z 6	Z 8					
----------	--------	-----	-----	--	--	--	--	--

Application:
Roughing cutter for universal machining.

Execution:
 ▪ HSSE Co 5
 ▪ Roughing teeth

- Without centre cutting
- Straight shank in accordance with DIN 1835 B
- **No. 15257:** Uncoated
- **No. 15258:** TiCN + TiN-coating for maximum service life



No. 15257

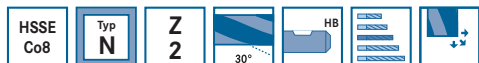


No. 15258

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15257	28	23	12	17	13	60	186	30	35	25	32	77		28	11	11	11		
15258	40	32	18	19	24	85	265	35	45	43	50	110		40	15	15	15		

mm	mm	mm	mm	mm	F mm	Z (PCS)	Tool holding device fz steel 700 (mm)	Type Surface	NR Uncoated	NR TiCN/TiN
								HB parallel shank	HB parallel shank	
30	30	90	20	0.2	6	0.08	030	●	030	●
35	30	90	20	0.2	6	0.09	035	●	035	●
40	32	92	25	0.2	8	0.13	040	●	040	●
50	36	100	32	0.2	8	0.14	050	●	050	●

ORION® HSSE Co 8 radius cutter (Milling cutter design standard DIN 844 K)
2-cutter, uncoated



Application:

Radius milling cutter, standard design, for universal use.

- Finishing teeth
- Centre cutting
- Straight shank according to DIN 1835 B

Execution:

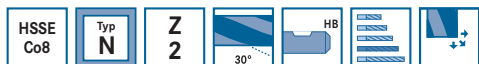
- HSSE Co 8
- Uncoated
- Standard design

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.		
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC	
15361	28	23	12	17	13	60	186	30	35	25	32	77			28	11	11	11		

mm	mm	mm	mm	mm	Type Surface	N	
						Uncoated	HB parallel shank
					Tool holding device fz steel 700 ● (mm)	15361... Ident. No.	
2	4	48	6	0.015	020	●	
3	5	49	6	0.018	030	●	
4	7	51	6	0.021	040	●	
5	8	52	6	0.033	050	●	
6	8	52	6	0.044	060	●	
7	10	60	10	0.056	070	●	
8	11	61	10	0.068	080	●	
9	11	61	10	0.074	090	●	
10	13	63	10	0.079	100	●	
12	16	73	12	0.09	120	●	
13	16	73	12	0.09	130	●	
14	16	73	12	0.1	140	●	
15	16	73	12	0.1	150	●	
16	19	79	16	0.11	160	●	
18	19	79	16	0.11	180	●	
20	22	88	20	0.12	200	●	
22	22	88	20	0.12	220	●	
24	26	102	25	0.12	240	●	
25	26	102	25	0.13	250	●	

Prod. Gr. 106

ORION® HSSE Co 8 radius cutter (Milling cutter design standard DIN 844 L)
2-cutter, uncoated



Application:

Radius milling cutter, long design, for universal use.

- Finishing teeth
- Centre cutting
- Straight shank according to DIN 1835 B
- Uncoated
- Long version

Execution:

- HSSE Co 8

Application No.	Steel (N/mm ²)			Stainless steel		Alu		Brass		Bronze		Plastics	Graphite G(C)FK	GG(G) GjMW	Titan-alloy	Nickel-alloy	Super-alloy	Hard mat.	
	<700	<1000	<1300	marten.	austen.	short	long	short	long	short	long							<55 HRC	<65 HRC
15366	28	23	12	17	13	60	186	30	35	25	32	77		28	11	11	11		

mm	mm	mm	mm	fz steel 700 ● (mm)	Type	N
					Surface	Uncoated
					Tool holding device	HB parallel shank
						15366... Ident. No.
2	7	54	6	0.014	020	●
3	8	56	6	0.017	030	●
4	11	63	6	0.02	040	●
5	13	68	6	0.031	050	●
6	13	68	6	0.041	060	●
7	16	80	10	0.053	070	●
8	19	88	10	0.063	080	●
9	19	88	10	0.069	090	●
10	22	95	10	0.074	100	●
11	22	102	12	0.08	110	●
12	26	110	12	0.084	120	●
13	26	110	12	0.09	130	●
14	26	110	12	0.09	140	●
15	26	110	12	0.09	150	●
16	32	123	16	0.1	160	●
18	32	123	16	0.11	180	●
20	38	141	20	0.11	200	●
22	38	141	20	0.11	220	●
25	45	166	25	0.12	250	●

Prod. Gr. 106



Designations of indexable inserts

D	S																																																																																												
C	P																																																																																												
M	K	<table border="1"> <tr> <th>± tolerances (µm)</th> <th>A</th> <th>C</th> <th>E</th> <th>G</th> <th>H</th> <th>J</th> <th>K</th> <th>M</th> <th>N</th> <th>U</th> </tr> <tr> <td>for incircle d</td> <td>25</td> <td>25</td> <td>25</td> <td>25</td> <td>13</td> <td>50-150</td> <td>50-150</td> <td>50-150</td> <td>50-150</td> <td>80-250</td> </tr> <tr> <td>for test dimension m</td> <td>5</td> <td>13</td> <td>25</td> <td>25</td> <td>13</td> <td>5</td> <td>13</td> <td>80-200</td> <td>80-200</td> <td>130-380</td> </tr> <tr> <td>for thickness s</td> <td>25</td> <td>25</td> <td>25</td> <td>50-130</td> <td>25</td> <td>25</td> <td>25</td> <td>50-130</td> <td>25</td> <td>130</td> </tr> </table>																± tolerances (µm)	A	C	E	G	H	J	K	M	N	U	for incircle d	25	25	25	25	13	50-150	50-150	50-150	50-150	80-250	for test dimension m	5	13	25	25	13	5	13	80-200	80-200	130-380	for thickness s	25	25	25	50-130	25	25	25	50-130	25	130																																
± tolerances (µm)	A	C	E	G	H	J	K	M	N	U																																																																																			
for incircle d	25	25	25	25	13	50-150	50-150	50-150	50-150	80-250																																																																																			
for test dimension m	5	13	25	25	13	5	13	80-200	80-200	130-380																																																																																			
for thickness s	25	25	25	50-130	25	25	25	50-130	25	130																																																																																			
T	N	<table border="1"> <tr> <th>Scalene insert shape or dimensions of symbols 5, 6, or 7 differing from the standard</th> <th>A</th> <th>C</th> <th>F</th> <th>G</th> <th>H</th> <th>J</th> <th>M</th> <th>N</th> <th>R</th> <th>Q</th> <th>T</th> <th>U</th> <th>W</th> </tr> <tr> <td></td> <td>70-90°</td> <td>70-90°</td> <td>70-90°</td> <td>70-90°</td> <td>70-90°</td> <td>70-90°</td> <td>70-90°</td> <td>70-90°</td> <td>40-60°</td> <td>40-60°</td> <td>40-60°</td> <td>40-60°</td> <td>40-60°</td> </tr> </table>																Scalene insert shape or dimensions of symbols 5, 6, or 7 differing from the standard	A	C	F	G	H	J	M	N	R	Q	T	U	W		70-90°	70-90°	70-90°	70-90°	70-90°	70-90°	70-90°	70-90°	40-60°	40-60°	40-60°	40-60°	40-60°																																																
Scalene insert shape or dimensions of symbols 5, 6, or 7 differing from the standard	A	C	F	G	H	J	M	N	R	Q	T	U	W																																																																																
	70-90°	70-90°	70-90°	70-90°	70-90°	70-90°	70-90°	70-90°	40-60°	40-60°	40-60°	40-60°	40-60°																																																																																
11	12	<table border="1"> <tr> <th>C</th> <th>04</th> <th>05</th> <th>06</th> <th>08</th> <th>09</th> <th>12</th> <th>16</th> <th>19</th> <th>25</th> <th>T</th> <th>08</th> <th>09</th> <th>11</th> <th>13</th> <th>16</th> <th>22</th> <th>27</th> <th>33</th> </tr> <tr> <td>D</td> <td></td> <td></td> <td></td> <td>11</td> <td>15</td> <td></td> <td></td> <td></td> <td></td> <td>V</td> <td></td> <td></td> <td>11</td> <td>13</td> <td>16</td> <td></td> <td></td> <td></td> </tr> <tr> <td>S</td> <td></td> <td></td> <td>06</td> <td>09</td> <td>12</td> <td>15</td> <td>19</td> <td>25</td> <td></td> <td>W</td> <td></td> <td></td> <td>03</td> <td>04</td> <td>05</td> <td>06</td> <td>08</td> <td></td> </tr> <tr> <td>Incircle d</td> <td>4.76</td> <td>5.56</td> <td>6.35</td> <td>7.94</td> <td>9.52</td> <td>12.7</td> <td>15.88</td> <td>19.05</td> <td>25.4</td> <td>Incircle d</td> <td>4.76</td> <td>5.56</td> <td>6.35</td> <td>7.94</td> <td>9.52</td> <td>12.7</td> <td>15.88</td> <td>19.05</td> </tr> </table>																C	04	05	06	08	09	12	16	19	25	T	08	09	11	13	16	22	27	33	D				11	15					V			11	13	16				S			06	09	12	15	19	25		W			03	04	05	06	08		Incircle d	4.76	5.56	6.35	7.94	9.52	12.7	15.88	19.05	25.4	Incircle d	4.76	5.56	6.35	7.94	9.52	12.7	15.88	19.05
C	04	05	06	08	09	12	16	19	25	T	08	09	11	13	16	22	27	33																																																																											
D				11	15					V			11	13	16																																																																														
S			06	09	12	15	19	25		W			03	04	05	06	08																																																																												
Incircle d	4.76	5.56	6.35	7.94	9.52	12.7	15.88	19.05	25.4	Incircle d	4.76	5.56	6.35	7.94	9.52	12.7	15.88	19.05																																																																											
T3	03	<table border="1"> <tr> <th>Thickness s</th> <th>01</th> <th>T1</th> <th>02</th> <th>03</th> <th>T3</th> <th>04</th> <th>05</th> <th>06</th> <th>07</th> <th>09</th> </tr> <tr> <td></td> <td>1.59</td> <td>1.98</td> <td>2.38</td> <td>3.18</td> <td>3.97</td> <td>4.76</td> <td>5.56</td> <td>6.35</td> <td>7.94</td> <td>9.52</td> </tr> </table>																Thickness s	01	T1	02	03	T3	04	05	06	07	09		1.59	1.98	2.38	3.18	3.97	4.76	5.56	6.35	7.94	9.52																																																						
Thickness s	01	T1	02	03	T3	04	05	06	07	09																																																																																			
	1.59	1.98	2.38	3.18	3.97	4.76	5.56	6.35	7.94	9.52																																																																																			
08	ED	<table border="1"> <tr> <th>Radius r</th> <th>00</th> <th>02</th> <th>04</th> <th>08</th> <th>12</th> <th>16</th> <th>20</th> <th>24</th> <th>32</th> <th>00</th> <th>MO</th> <th>MO</th> <th>MO</th> <th>MO</th> <th>MO</th> <th>MO</th> <th>MO</th> <th>MO</th> <th>MO</th> </tr> <tr> <td>Corner radius</td> <td>0</td> <td>0.2</td> <td>0.4</td> <td>0.8</td> <td>1.2</td> <td>1.6</td> <td>2.0</td> <td>2.4</td> <td>3.2</td> <td>Round plate (inch)</td> <td>Round plate (metr.)</td> <td>Round plate (inch)</td> <td>Round plate (metr.)</td> <td>Round plate (inch)</td> <td>Round plate (metr.)</td> <td>Round plate (inch)</td> <td>Round plate (metr.)</td> <td>Round plate (inch)</td> <td>Round plate (metr.)</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>45°</td> <td>60°</td> <td>75°</td> <td>85°</td> <td>90°</td> <td>Misc.</td> <td>5°</td> <td>7°</td> <td>15°</td> <td>20°</td> <td>25°</td> <td>30°</td> <td>0°</td> <td>11°</td> <td>Misc.</td> </tr> </table>																Radius r	00	02	04	08	12	16	20	24	32	00	MO	MO	MO	MO	MO	MO	MO	MO	MO	Corner radius	0	0.2	0.4	0.8	1.2	1.6	2.0	2.4	3.2	Round plate (inch)	Round plate (metr.)	Round plate (inch)	Round plate (metr.)	Round plate (inch)	Round plate (metr.)	Round plate (inch)	Round plate (metr.)	Round plate (inch)	Round plate (metr.)											45°	60°	75°	85°	90°	Misc.	5°	7°	15°	20°	25°	30°	0°	11°	Misc.											
Radius r	00	02	04	08	12	16	20	24	32	00	MO	MO	MO	MO	MO	MO	MO	MO	MO																																																																										
Corner radius	0	0.2	0.4	0.8	1.2	1.6	2.0	2.4	3.2	Round plate (inch)	Round plate (metr.)	Round plate (inch)	Round plate (metr.)	Round plate (inch)	Round plate (metr.)	Round plate (inch)	Round plate (metr.)	Round plate (inch)	Round plate (metr.)																																																																										
										45°	60°	75°	85°	90°	Misc.	5°	7°	15°	20°	25°	30°	0°	11°	Misc.																																																																					
	R																																																																																												
	-41	<p>These indications do not form part of the standard and are facultative. e. g. -41 for chip former geometry 01520 for chip face bezel 0.15 mm x 20°</p>																																																																																											

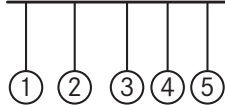
Example: turning
 Example: milling
 DCMT 11 T3 08-41
 SPKN 12 03 ED R



Cemented carbide key



* **HC 7620**



- ① H = Cemented carbide
- ② C = Coated / W = Uncoated
- ③ 7 = Generation of cemented carbide grade
- ④ ISO Group 6 = P; 5 = M; 4 = K ; 3 = N; 2 = S
- ⑤ As per ISO Group P10; P20; P30;

***Note:** ORION cemented carbide grades follow the same pattern, with the difference that an O is placed in front, e.g. OHC 7625



overview: cemented carbide qualities ATORN/ORION

appli- cation	coating	range of applications									
		01	05	10	15	20	25	30	35	40	45
ISO P	CVD	HC7610									
	CVD			HC7620							
	CVD					HC7630					
	CVD				OHC7615						
	CVD			OHC7625							
	CVD					OHC7635					
ISO M	PVD	HC7510									
	PVD			HC7520							
	PVD					HC7530					
	PVD				OHC7515						
	PVD			OHC7520							
	PVD			OHC7525							
	PVD					OHC7530					
	PVD					OHC7535					
ISO K	CVD	OHC6410									
	CVD			OHC6420							
ISO N	CVD	OHC7310									
	CVD	OHC6310									
	CVD	OHW6310									
	CVD	HC6310									
	CVD	HW6310									
ISO S	CVD	HC7210									
	CVD			HC7220							

← wear resistance toughness →



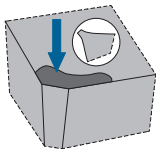
cutting data
on packaging



the HK ISO range of indexable inserts is always delivered with cut data on the packaging. this provides the user with a high degree of safety and good handling.

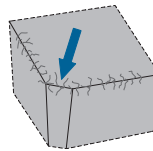


Indexable inserts - Types of wear and solution proposals



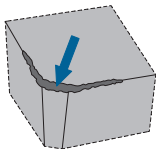
Built-up edges

- Select cutting material types with less friction resistance
- Increase the cutting speed
- Increase the feed
- Do not use water-soluble coolant
- Check coolant use
- Check indexable insert classification
- Check chip breaker selection
- Increase clearance angle
- Reduce chamfer and rounding of cutting edge



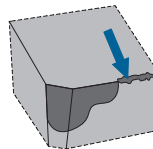
Ridge cracking at the cutting edge

- Select cutting material type less sensitive to temperature fluctuations
- Reduce cutting speed
- Reduce feed
- Reduce cutting depth
- Do not use water-soluble coolant
- Check coolant use
- Check chip breaker selection
- Increase clearance
- Reduce chamfer and rounding of cutting edge



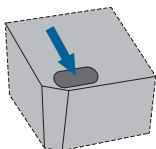
Brittle damage to the cutting edge

- Use tougher cemented carbide type
- Select less intensive cutting conditions
- Apply different cutting edge geometry
- Reduce feed when inserting into opening



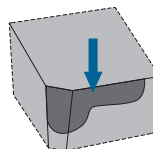
Damage to the cutting edge (outside opening)

- Change feed
- Select tool with different adjustment angle
- Apply different cutting edge geometry (different chip former)
- Use tougher cemented carbide type



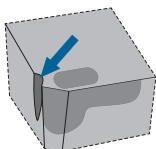
Scour wear

- Select harder cutting material
- Reduce cutting speed
- Reduce feed
- Reduce cutting depth
- Check coolant use
- Check chip breaker selection
- Increase clearance angle



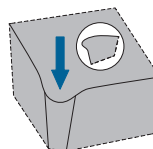
Breaking of cutting edge

- Select tougher cutting material
- Select cutting material type less sensitive to temperature fluctuations
- Reduce feed
- Reduce cutting depth
- Check chip breaker selection
- Increase size of chamfer and rounding of cutting edge
- Select machine with higher performance and rigidity



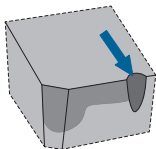
Oxidation gouging on secondary cutting edge

- Apply coated or wear-resistant cemented carbide types, if possible apply coated indexable inserts with Al₂O₃ content.
- Apply cooling emulsion or Increase cooling intensity
- Reduce cutting speed



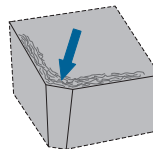
Plastic deformation

- Apply wear-resistant cemented carbide type
- Reduce cutting speed
- Reduce feed
- Apply cooling emulsion or Increase cooling intensity
- Apply indexable inserts with a larger rounding radius of the tip
- Apply indexable inserts with larger tip angle



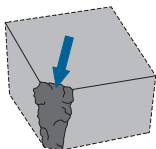
Notch wear on main cutting edge

- Apply coated or wear-resistant cemented carbide type, if possible apply coated indexable inserts with Al₂O₃ content.
- Use tool with a smaller adjustment angle
- Distribute chip unevenly



Fatigue crack along the open space

- Select tougher cemented carbide type
- Change retracting and extending of tool
- Change contact conditions
- Apply different cutting edge geometry or Indexable inserts with a different design of cutting edge
- Change feed



Breaking of cutting edge

- Select tougher cutting material
- Select cutting material type less sensitive to temperature fluctuations
- Reduce feed
- Reduce cutting depth
- Check chip breaker selection
- Increase size of chamfer and rounding of cutting edge
- Select machine with higher performance and rigidity

ORION® Face milling cutter 45°

For milling cutter indexable inserts SEET 12T3..

Application:

For universal use in all materials, predestined for cast processing.

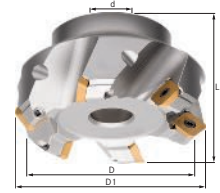
Execution:

- Nickel-plated supports
- Long-term tested support design

- Normal and fine pitch
- Clamping screw tightening torque (indexable insert) M3.5 = 3.9 Nm

Advantage:

- Highly positive indexable milling inserts for low-vibration, steady cutting
- Outstanding value for money











D (mm)	D1 max (mm)	L1 (mm)	d (mm)	max. ap (mm)	Number of cutting edges (PCS)	Suitable for indexable inserts	Face milling cutter 45°		Clamping screw for indexable inserts		Shims		Clamping screw for shims	
							16003... Ident. No.		16108... Ident. No.		16108... Ident. No.		16108... Ident. No.	
50	61	40	22	6	3	SEET 12T3..	200	●	163	●	-	-	-	-
63	74	40	22	6	4	SEET 12T3..	201	●	163	●	-	-	-	-
63	74	40	22	6	5	SEET 12T3..	206	●	163	●	-	-	-	-
80	91	50	27	6	4	SEET 12T3..	202	●	163	●	-	-	-	-
80	91	50	27	6	6	SEET 12T3..	207	●	163	●	-	-	-	-
100	107	50	32	6	5	SEET 12T3..	203	●	163	●	-	-	-	-
100	107	50	32	6	7	SEET 12T3..	208	●	163	●	-	-	-	-
125	137.5	63	40	6	6	SEET 12T3..	204	●	163	●	-	-	-	-
125	137.5	63	40	6	8	SEET 12T3..	209	●	164	●	165	●	168	●
160	170	63	40	6	10	SEET 12T3..	210	●	164	●	165	●	168	●

Prod. Gr. 148

ORION® Indexable milling insert SEET 12T3..
for face milling cutters no. 16003

Application:
Ident. No. 008: Wide finishing plates for optimised surface qualities

Delivery:
Box quantity: 10 pieces



					Surface Carbide type		Coated OHC4540	Uncoated OHW4410	Coated OHC4410	Coated OHC4620	Coated OHC4544		
					Material to be processed		Steel Stainless steel Special alloy	Non-ferrous metal	Cast metal	Steel Stainless steel	Stainless steel Special alloy		
					Suitable for material group P		●			●			
					Suitable for material group M		●			●	●		
					Suitable for material group N			●					
					Suitable for material group K				●				
					Suitable for material group S		○						
					Suitable for material group H							○	
ISO name	Type	Knife edge length (mm)	Corner chamfer (mm)	16109... Ident. No.	16109... Ident. No.		16109... Ident. No.		16109... Ident. No.		16109... Ident. No.		
	SEET 12T3-DF..	Smoothing	13	2.6	001	●	-	-	-	-	-	-	-
	SEET 12T3-DM..	Medium machining	13	2.6	002	●	-	-	-	-	-	-	-
	SEET 12T3-DR..	Rough machining	13	2.6	003	●	-	-	-	-	-	-	-
	SEET 12T3-LH..	Smoothing, medium machining	13	2.6	-	-	004	●	-	-	-	-	-
	SEET 12T3-CM..	Medium machining	13	2.6	-	-	-	-	005	●	-	-	-
	SEET 12T3-CR..	Rough machining	13	2.6	-	-	-	-	007	●	-	-	-
	SEET 12T3-W..	Wide finishing	13	2.6	-	-	-	-	-	-	008	●	-
	SEET 12T3-EM..	Medium machining	13	2.6	-	-	-	-	-	-	-	-	010

Prod. Gr. 148

ATORN® ORION® Indexable milling insert AP.. 16..

For cutters with indexable inserts no. 16019/16055



Delivery:
Packaging unit: 10 pieces

				ATORN®				ORION®			
Surface				Coated		Coated		Coated		Coated	
Carbide type				HC4535		HC4615		HC4635		HC4620	
Material to be processed				Steel Stainless steel		Steel		Steel Cast metal		Steel Stainless steel	
Suitable for material group P				●		●		●		●	
Suitable for material group M				●						○	
Suitable for material group N											
Suitable for material group K								○			
Suitable for material group S											
Suitable for material group H											
ISO name	Knife edge length (mm)	Edge radius (mm)	Indexable insert type	16109... Ident. No.		16109... Ident. No.		16109... Ident. No.		16109... Ident. No.	
 APKT 1604 PDER-S	17	0.8	27	128	●	127	●	129	●	-	-
 APKT 160408 PDER	17.88	0.8	28	-	-	-	-	-	-	140	●

ORION = Prod. Gr. 133
ATORN = Prod. Gr. 156

ORION® Indexable milling insert APKT 11/15

Delivery:
Packaging unit: 10 pieces

			Surface		Coated		Coated		Coated		Coated	
Carbide type			OHC4410		OHC4620		OHC4626		OHC4626		OHC4540	
Material to be processed			Steel Non-ferrous metal Cast metal		Steel Stainless steel Cast metal Special alloy		Steel Cast metal		Steel Cast metal		Steel Stainless steel Cast metal Special alloy	
Suitable for material group P			○		●		●		●		●	
Suitable for material group M					○						●	
Suitable for material group N			○									
Suitable for material group K			●		●		●		●		○	
Suitable for material group S					○						●	
Suitable for material group H												
ISO name	Knife edge length (mm)	Edge radius (mm)	16109... Ident. No.		16109... Ident. No.		16109... Ident. No.		16109... Ident. No.		16109... Ident. No.	
 APKT 1505 PDER-M	15	0.8	429	●	430	●	428	●	-	-	-	-
ADKT 1505 PD-ER-M	15	0.8	-	-	-	-	-	-	-	431	●	-
 APKT 1103 PDER	9.68	0.8	-	-	440	●	-	-	-	-	-	-

Prod. Gr. 156

ORION® Angular milling cutter 90°

For milling cutter indexable inserts SEET 1203..

Application:
Universal use for exact 90° cuts.

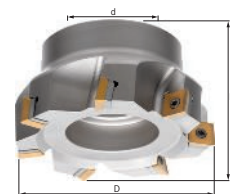
▪ Clamping screw tightening torque (indexable insert) M3.5 = 3.5 Nm

Execution:

- Wear-resistant, nickel-plated version
- Precision supports ensure insert fits perfectly
- Unequal division for excellent smooth running

Advantage:

- Low-vibration running
- Nickel-plated for long service life
- Very high surface quality
- Excellent value for money



D (mm)	L1 (mm)	d (mm)	max. ap (mm)	Number of cutting edges (PCS)	Suitable for indexable inserts	Angular milling cutter 90°		Clamping screw for indexable inserts		Shims		Clamping screw for shims	
						16004... Ident. No.	16004... Ident. No.	16108... Ident. No.	16108... Ident. No.	16108... Ident. No.	16108... Ident. No.	16108... Ident. No.	16108... Ident. No.
50	40	22	11.4	4	SEET 1203..	001	●	163	●	-	-	-	-
63	40	22	11.4	5	SEET 1203..	002	●	163	●	167	●	168	●
80	50	27	11.4	6	SEET 1203..	003	●	163	●	167	●	168	●
100	50	32	11.4	7	SEET 1203..	004	●	163	●	167	●	168	●
125	63	40	11.4	8	SEET 1203..	005	●	163	●	167	●	168	●







Prod. Gr. 148

ORION® Indexable milling insert SEET 1203..

for angular milling cutter no. 16004

Delivery:

Box quantity: 10 pieces

		Surface Carbide type	Coated OHC4620	Coated OHC4540	Coated OHC4410	Uncoated OHW4410
		Material to be processed	Steel Stainless steel	Steel Stainless steel Special alloy	Steel Cast metal	Non-ferrous metal
		Suitable for material group P	●	●	○	
		Suitable for material group M	●	●		
		Suitable for material group N				●
		Suitable for material group K			●	
		Suitable for material group S		○		
		Suitable for material group H				
ISO name	Knife edge length (mm)	Edge radius (mm)	16109... Ident. No.	16109... Ident. No.	16109... Ident. No.	16109... Ident. No.
 SEET 120308 PDER-PF	13.3	0.8	011	●	-	-
 SEET 120308 PDER-PM	13.3	0.8	013	●	-	-
 SEET 120308 PDER-PR	13.3	0.8	-	-	015	●
 SEET 120308 PDER-PM	13.3	0.8	-	-	-	017
 SEET 120308 PDER-PR	13.3	0.8	-	-	-	019
 SEET 120308 PDER-LH	13.3	0.8	-	-	-	-
						021

Prod. Gr. 148



ORION® Copy and face milling cutter heads

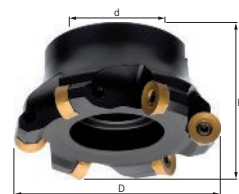
For indexable milling inserts RCKT1606.., RCKT2006..

Application:

For face milling and copy milling for medium to rough milling

Execution:

- Sturdy support design, tested over many years
- With internal cooling
- Clamping screw tightening torque (indexable insert) M5 = 8 Nm



D (mm)	L1 (mm)	d (mm)	max. ap (mm)	Number of cutting edges (PCS)	Suitable for indexable inserts	Copy and face milling cutter heads		Clamping screw for indexable inserts	
						16037... Ident. No.	16108... Ident. No.	16108... Ident. No.	16108... Ident. No.
63	50	22	5	4	RCKT 1606..	001	●	030	●
80	50	27	5	5	RCKT 1606..	002	●	030	●
100	50	32	5	6	RCKT 1606..	003	●	030	●
100	50	32	5	6	RCKT 2006..	004	●	031	●
125	63	40	5	7	RCKT 2006..	005	●	031	●
160	63	40	5	8	RCKT 2006..	006	●	031	●



Prod. Gr. 148

ORION® Indexable milling insert RCKT

For copying and face milling cutter no. 16037

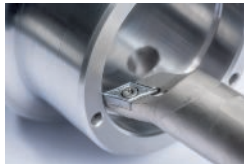
Delivery:

Box quantity: 10 pieces

	Surface Carbide type	Coated OHC4544		Coated OHC4620		Coated OHC4540		Coated OHC4410	
		Stainless steel Special alloy	Steel Stainless steel Cast metal	Steel Stainless steel Special alloy	Steel Cast metal	Steel Cast metal	Steel Cast metal	Steel Cast metal	
	Suitable for material group P		●	●	●	●	○		
	Suitable for material group M	●		○		●			
	Suitable for material group N								
	Suitable for material group K			●				●	
	Suitable for material group S	○				○			
	Suitable for material group H								
	ISO name	16109... Ident. No.		16109... Ident. No.		16109... Ident. No.		16109... Ident. No.	
	RCKT 1606 MO-DM	802	●	-	-	-	-	-	-
	RCKT 2006 MO-DM	804	●	806	●	-	-	-	-
	RCKT 1606 MO-DR	-	-	-	-	801	●	803	●
	RCKT 2006 MO-DR	-	-	-	-	805	●	807	●

Prod. Gr. 148

i Determination of the correct design for lathing



The following structural designs are distinguished for lathing:

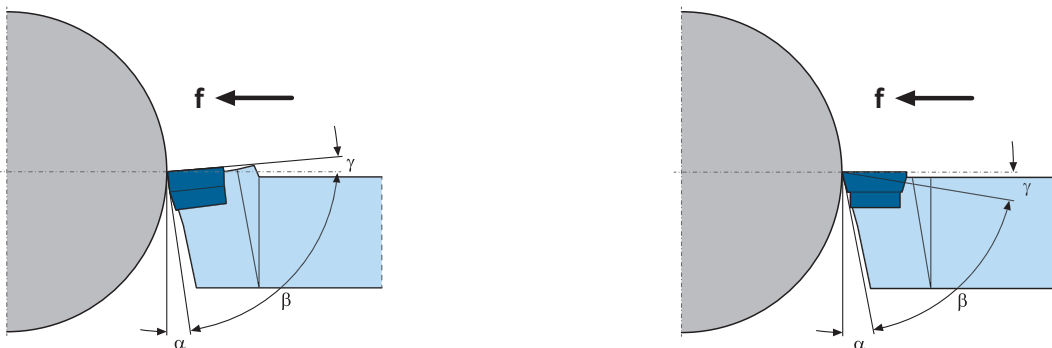
negative structural design

The negative structural design has been developed for rough pre-machining and is characterised by excellent force absorption. With this structural design, high infeeds are possible and heavy duty machining steps, such as interrupted cuts or overtightening of scale films, can be implemented.

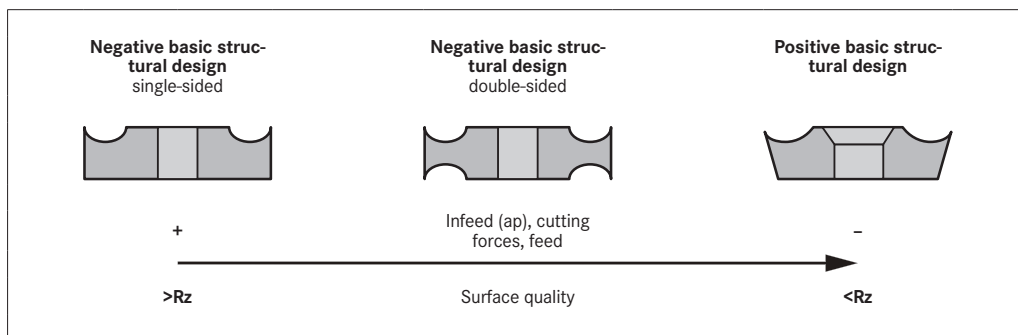
Prerequisites for this design are stable workpiece clamping and a stable machine.

Positive structural design

The positive structural design has been developed for the final finishing of components with high surface quality. Positive engagement with the workpiece minimises cutting forces. This structural shape offers particular advantages in the case of unstable tool clamping or machining conditions, such as in the event of a high projection length in internal machining.



The following graph again illustrates the correlation:



i Selection of indexable insert design

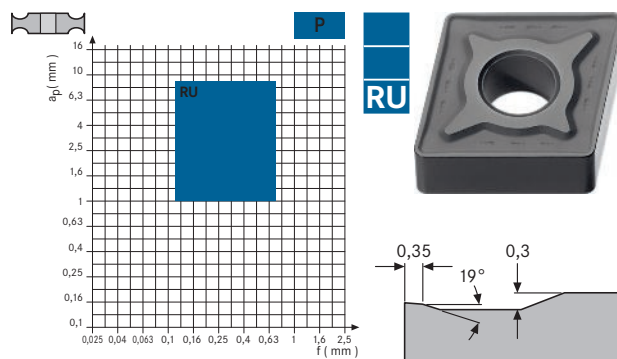
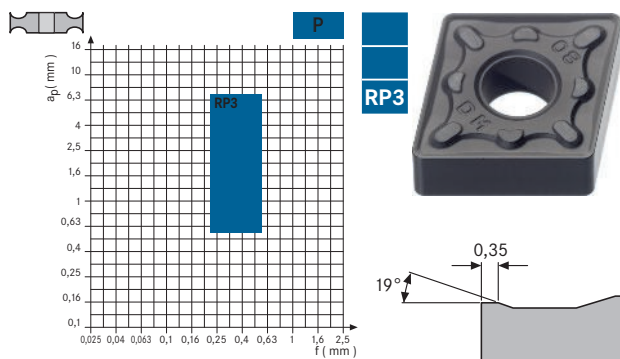
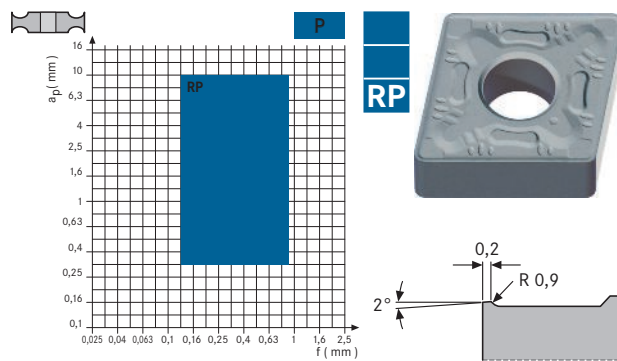
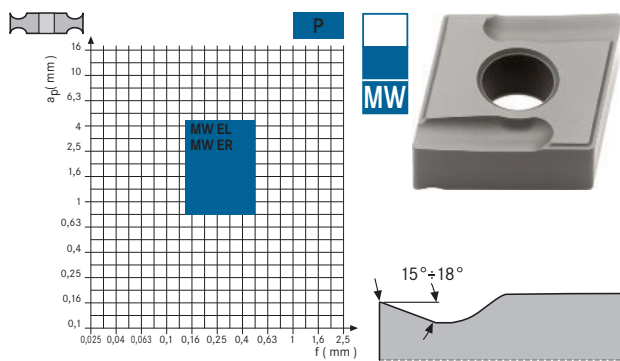
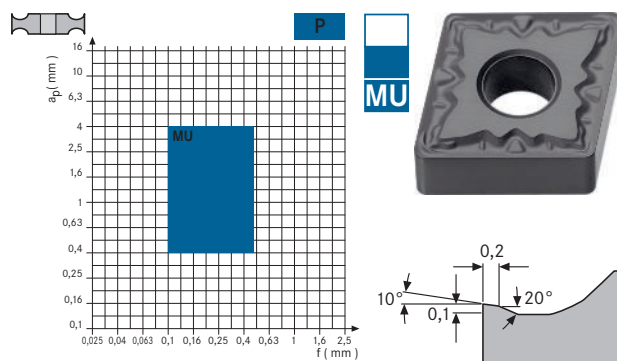
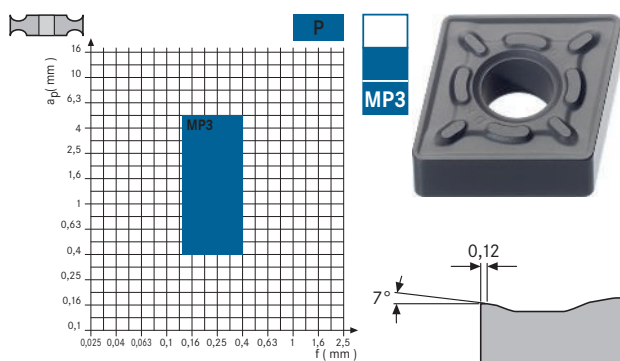
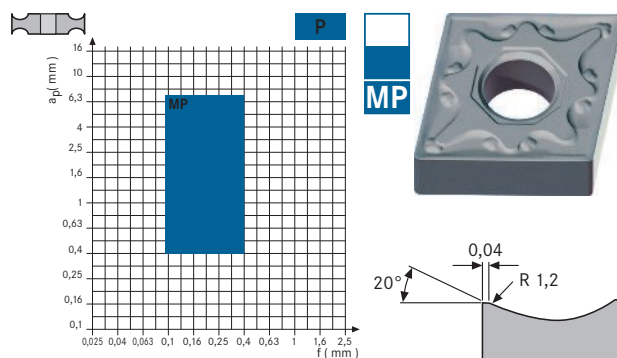
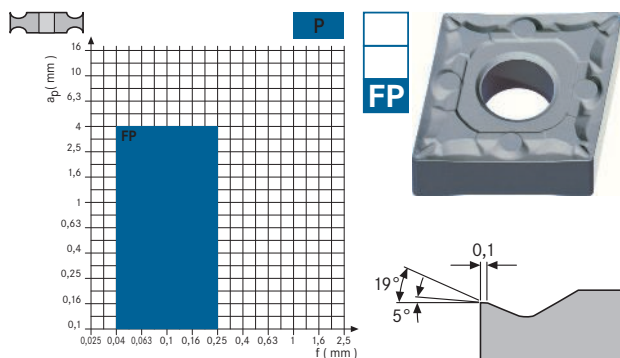
After correctly selecting the appropriate structural design, determining the insert form is an important component during machining. The following table illustrates the issue:

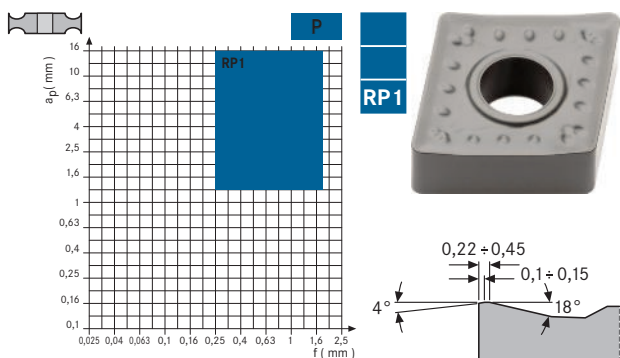
Machining type	R	S	C	W	T	D	V
		90°	80°	80°	60°	55°	35°
Rough machining with favourable cutting conditions	++	++	++	+			
Rough machining with unfavourable cutting conditions	++	++	+	+			
Medium machining with favourable cutting conditions		+	++	+	++	++	
Medium machining with unfavourable cutting conditions		++	++	++	+	+	
Smoothing			++	++	++	++	++
Longitudinal turning and facing			++	++			
Profile turning				++			++
Low vibrations					++	++	++
Machining of hard materials	++	++					++



selection of chip breaker – negative chip breaker steel materials

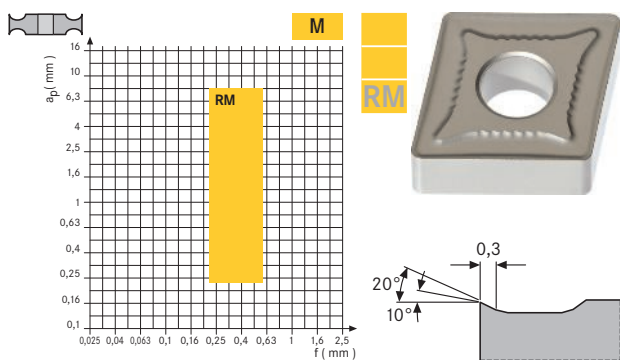
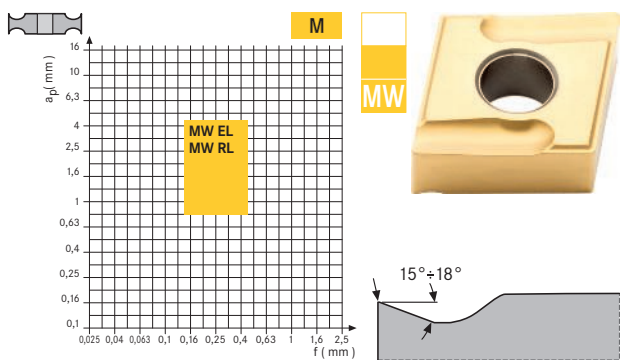
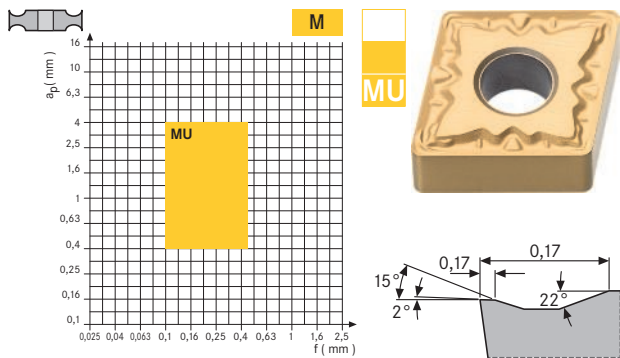
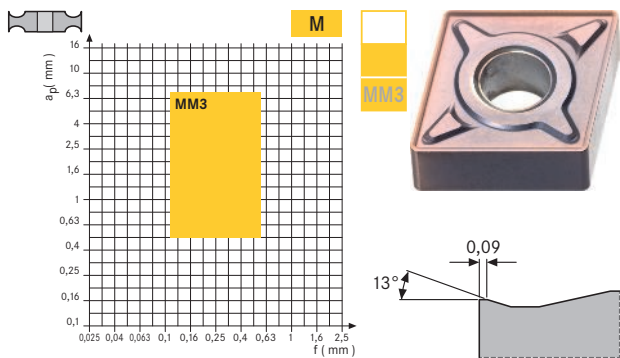
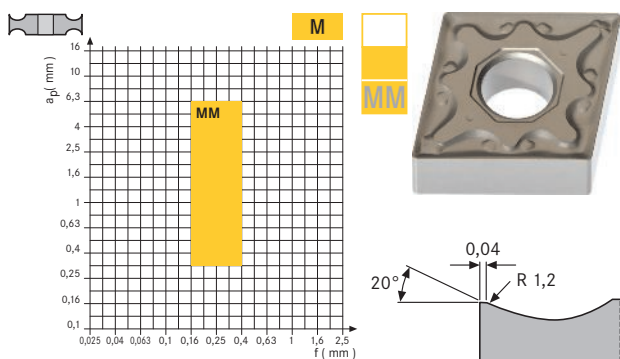
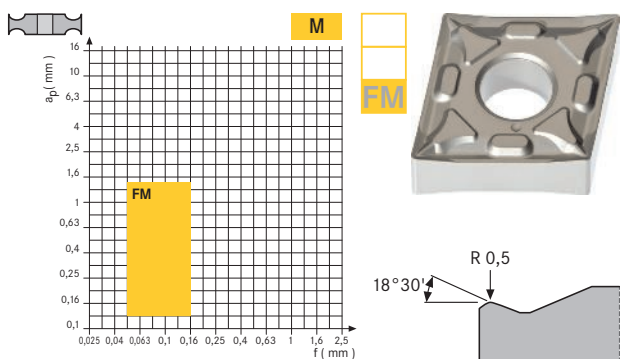
selecting the correct chip breaker depends on the infeed (a_p), the cutting conditions and the feed values to be achieved. the aim is to achieve optimal chip breakage with a defined infeed. the following graphs illustrate the different chip breakers and their applications.

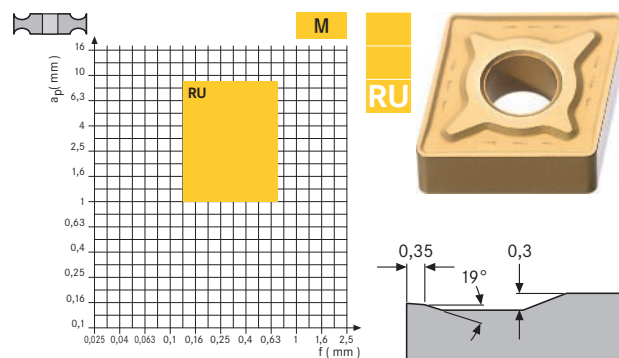
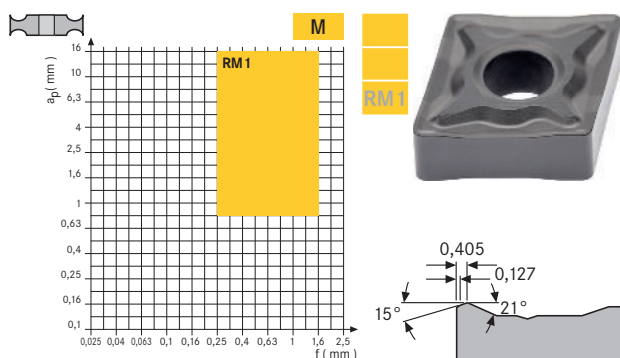




i selection of chip breaker – negative chip breaker
stainless steels

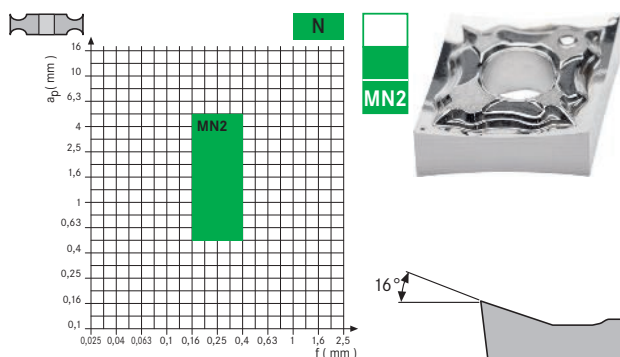
selecting the correct chip breaker depends on the infeed (a_p), the cutting conditions and the feed values to be achieved. the aim is to achieve optimal chip breakage with a defined infeed. the following graphs illustrate the different chip breakers and their applications.





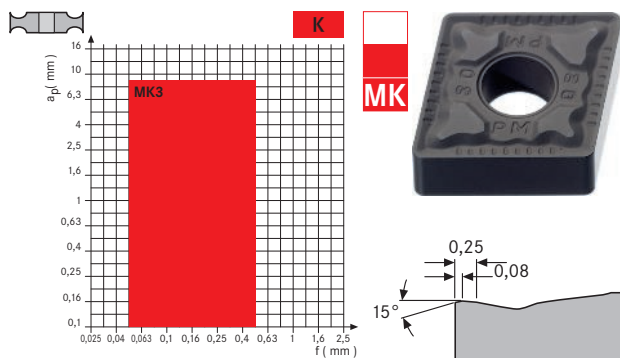
i selection of chip breaker – negative chip breaker non-ferrous metals

selecting the correct chip breaker depends on the infeed (a_p), the cutting conditions and the feed values to be achieved. the aim is to achieve optimal chip breakage with a defined infeed. the following graphs illustrate the different chip breakers and their applications.



i selection of chip breaker – negative chip breaker cast materials

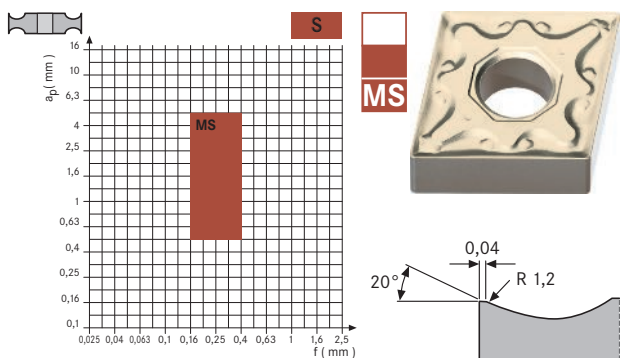
selecting the correct chip breaker depends on the infeed (a_p), the cutting conditions and the feed values to be achieved. the aim is to achieve optimal chip breakage with a defined infeed. the following graphs illustrate the different chip breakers and their applications.





selection of chip breaker – negative chip breaker
special alloys

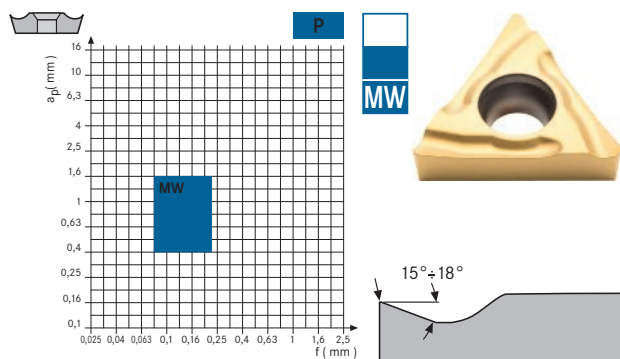
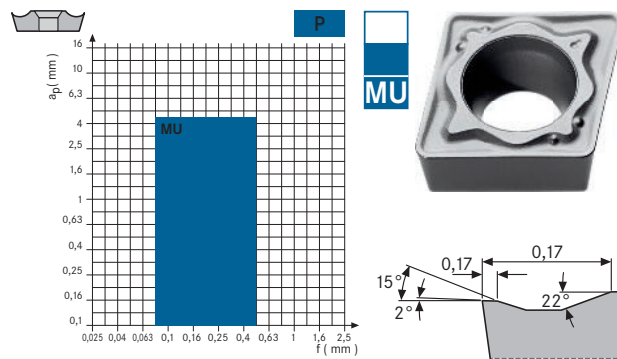
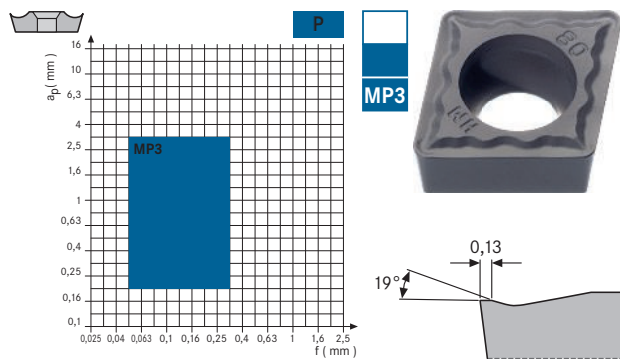
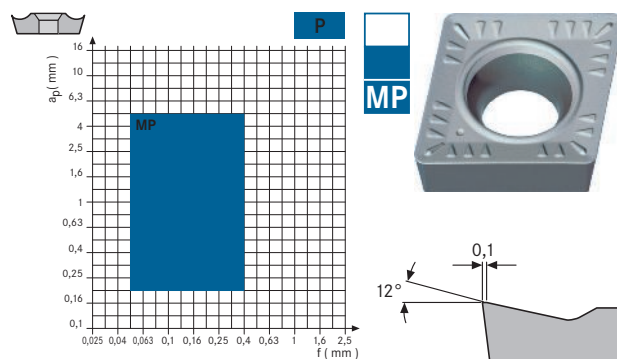
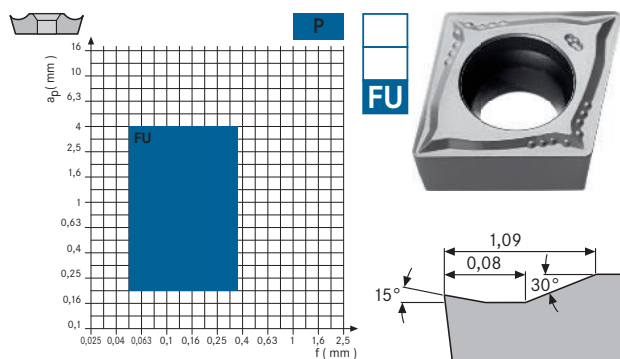
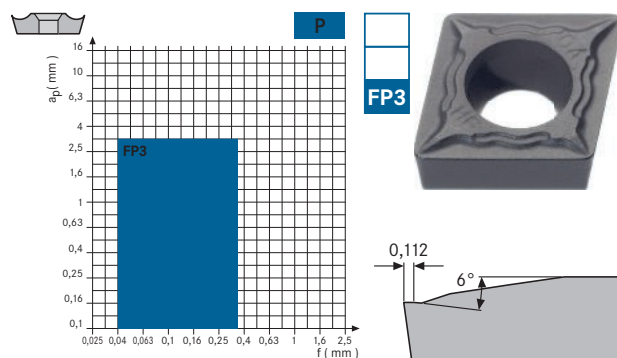
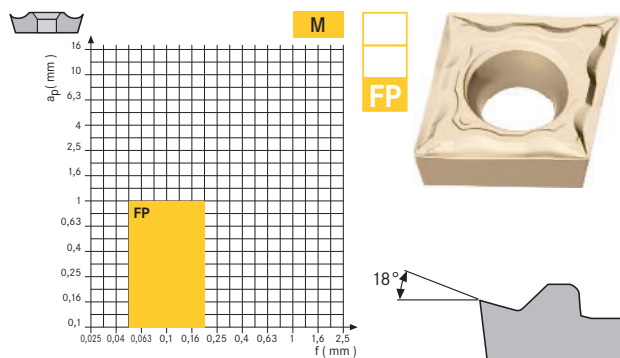
selecting the correct chip breaker depends on the infeed (ap), the cutting conditions and the feed values to be achieved. the aim is to achieve optimal chip breakage with a defined infeed. the following graphs illustrate the different chip breakers and their applications.





selection of chip breaker – positive chip breaker steel materials

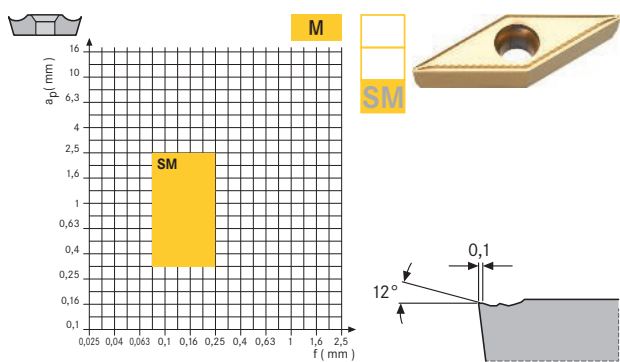
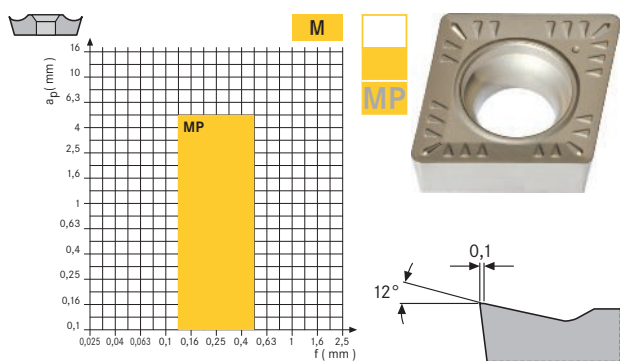
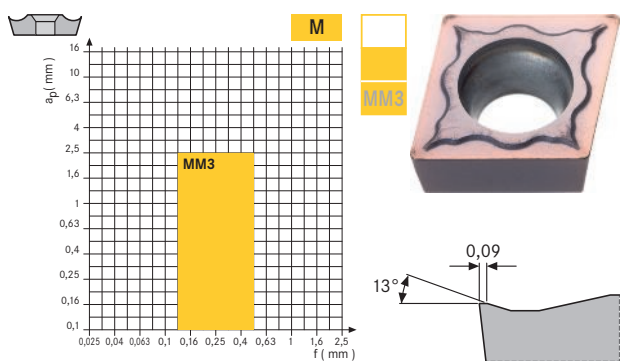
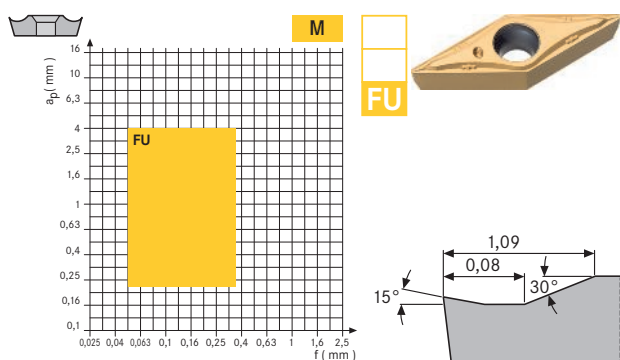
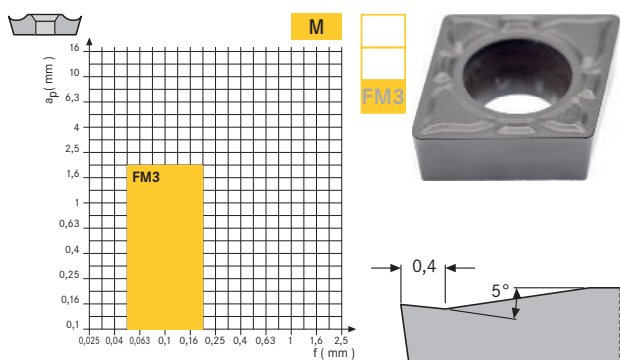
selecting the correct chip breaker depends on the infeed (a_p), the cutting conditions and the feed values to be achieved. the aim is to achieve optimal chip breakage with a defined infeed. the following graphs illustrate the different chip breakers and their applications.





selection of chip breaker – positive chip breaker
stainless steels

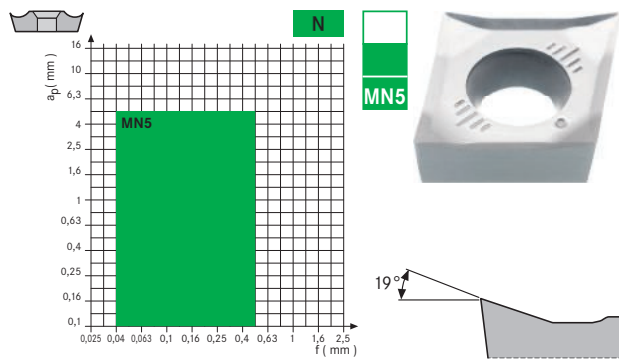
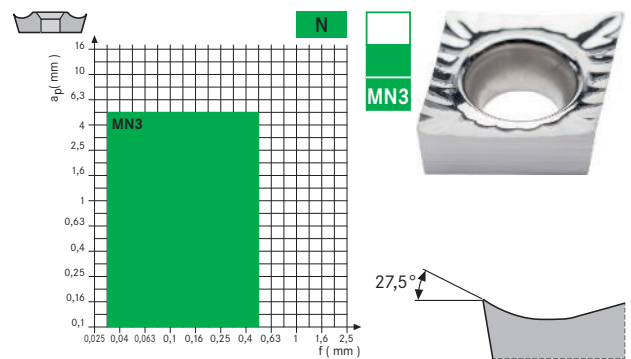
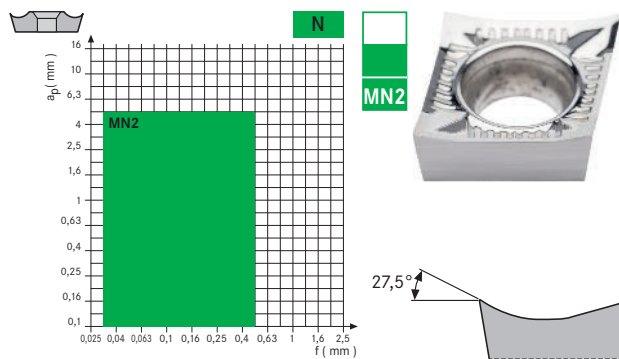
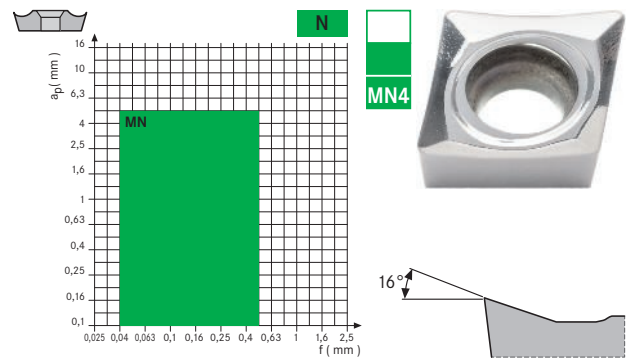
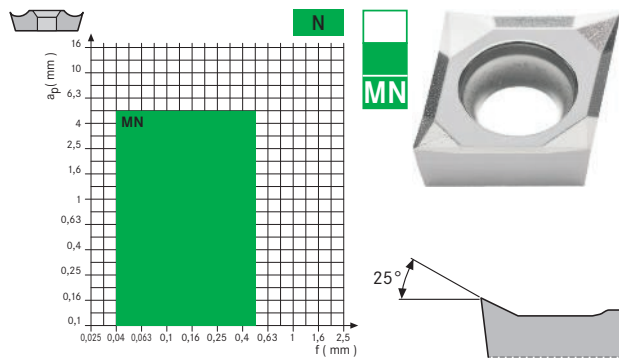
selecting the correct chip breaker depends on the infeed (a_p), the cutting conditions and the feed values to be achieved. the aim is to achieve optimal chip breakage with a defined infeed. the following graphs illustrate the different chip breakers and their applications.





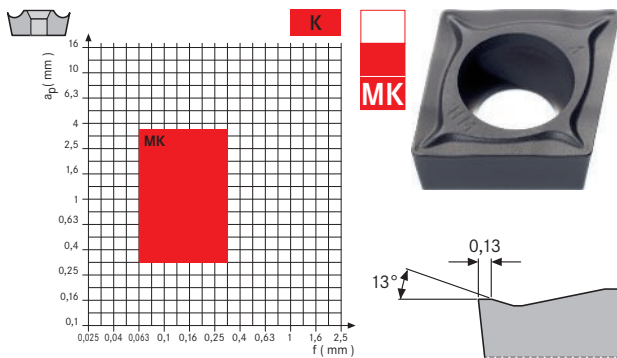
selection of chip breaker – positive chip breaker
non-ferrous metals

selecting the correct chip breaker depends on the infeed (a_p), the cutting conditions and the feed values to be achieved. the aim is to achieve optimal chip breakage with a defined infeed. the following graphs illustrate the different chip breakers and their applications.



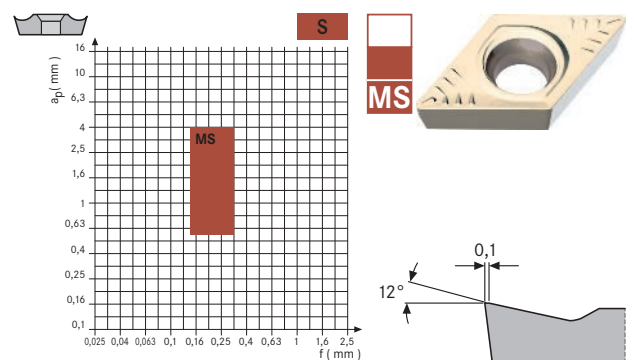
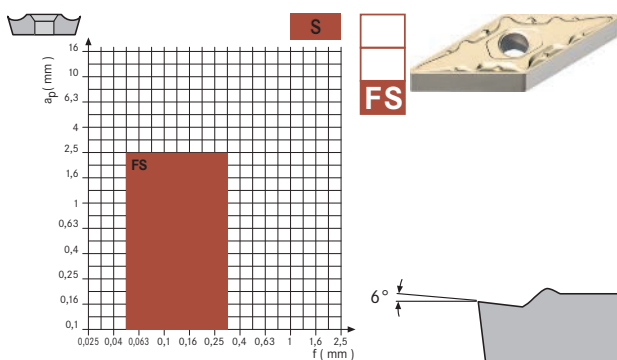
selection of chip breaker – positive chip breaker cast materials

selecting the correct chip breaker depends on the infeed (a_p), the cutting conditions and the feed values to be achieved. the aim is to achieve optimal chip breakage with a defined infeed. the following graphs illustrate the different chip breakers and their applications.



selection of chip breaker – positive chip breaker special alloys

selecting the correct chip breaker depends on the infeed (a_p), the cutting conditions and the feed values to be achieved. the aim is to achieve optimal chip breakage with a defined infeed. the following graphs illustrate the different chip breakers and their applications.

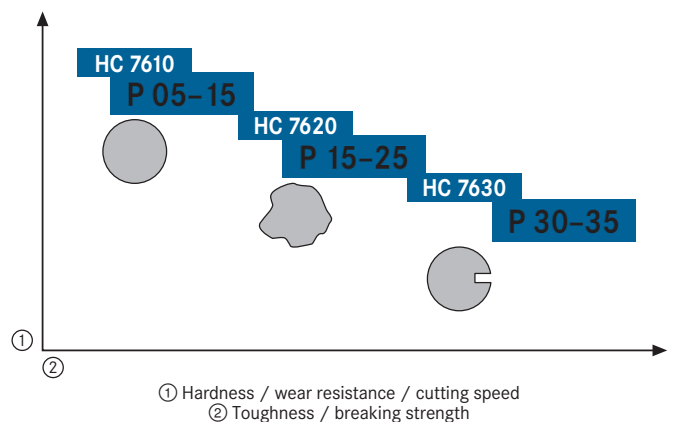
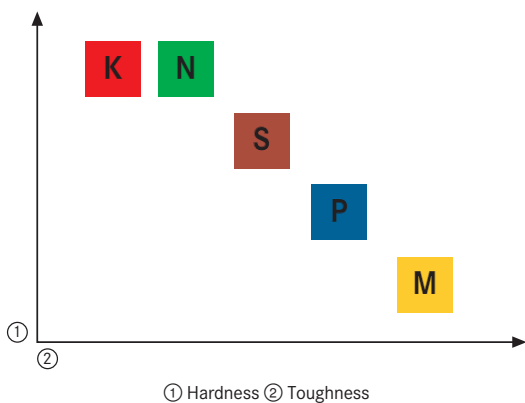


Selection of cemented carbide grade

When selecting the cemented carbide grade, the following basic substrates are available to the user. A distinction is made between the following basic substrates in terms of hardness and wear resistance:

The various basic substrates can produce very hard qualities or a high level of toughness depending on the composition.

- Very hard substrates are identified by a low numeral P10
- Very tough substrates are identified by a high numeral P30



- Good cutting conditions
- Average cutting conditions
- Unfavourable cutting conditions

As illustrated in the diagram, hard substrates can only be used under favourable cutting conditions. These substrates are very hard and wear-resistant but will break under difficult cutting conditions. In the case of unfavourable cutting conditions, we use very tough substrates that are highly impact-resistant but less wear-resistant.



ISO indexable inserts for turning tools

D	1. Insert shape																
C	2. Clearance angle																
M	3. Tolerance class																
T	4. Insert type																
11	5. Cutter length																
T3	6. Insert thickness																
08	7. Cutter angle																
	8. Cutter version																
	9. Cut direction																
-MP	10. Additional indications																

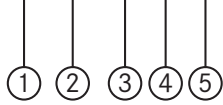
Example: turning **DCMT 11 T3 08-AP**



Cemented carbide key



* **HC 7620**



- ① H = Cemented carbide
- ② C = Coated / W = Uncoated
- ③ 7 = Generation of cemented carbide grade
- ④ ISO Group 6 = P; 5 = M; 4 = K ; 3 = N; 2 = S
- ⑤ As per ISO Group P10; P20; P30;

***Note:** ORION cemented carbide grades follow the same pattern, with the difference that an O is placed in front, e.g. OHC 7625



overview: cemented carbide qualities ATORN/ORION

appli- cation	coating	range of applications												
		01	05	10	15	20	25	30	35	40	45			
ISO P	CVD	HC7610												
	CVD	HC7620												
	CVD	HC7630												
	CVD	OHC7615												
	CVD	OHC7625												
	CVD	OHC7635												
ISO M	PVD	HC7510												
	PVD	HC7520												
	PVD	HC7530												
	PVD	OHC7515												
	PVD	OHC7520												
	PVD	OHC7525												
	PVD	OHC7530												
	PVD	OHC7535												
ISO K	CVD	OHC6410												
	CVD	OHC6420												
ISO N	CVD	OHC7310												
	CVD	OHC6310												
	CVD	OHW6310												
	CVD	HC6310												
	CVD	HW6310												
ISO S	CVD	HC7210												
	CVD	HC7220												

← wear resistance toughness →



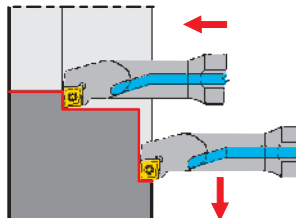
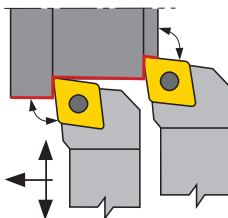
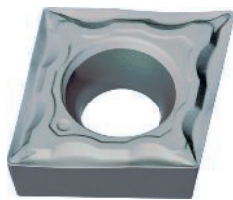
cutting data
on packaging



the HK ISO range of indexable inserts is always delivered with cut data on the packaging. this provides the user with a high degree of safety and good handling.



CC.. Indexable inserts - for longitudinal turning and facing
For longitudinal turning and facing



ORION® CCMT smoothing positive
ISO P

			Carbide type	
Machining conditions for indexable insert			OHC7625	OHC7615
			Medium	Good
Vc in steel ●			150-360 m/min	180-330 m/min
Vc in stainless steel ●			90-215 m/min	
Vc in cast iron ●				170-310 m/min
Vc in special alloys ●			40-105 m/min	
ISO name	min./max. ap	f min./max.	17863... Ident. No.	17863... Ident. No.
CCMT 060202-FU	0.2-2 mm	0.05-0.15 mm/U	451 ●	- ●
CCMT 060204-FU	0.4-2 mm	0.05-0.23 mm/U	452 ●	388 ●
CCMT 09T304-FU	0.4-3 mm	0.1-0.3 mm/U	453 ●	389 ●
CCMT 09T308-FU	0.8-3 mm	0.15-0.35 mm/U	454 ●	390 ●
CCMT 120408-FU	0.8-4 mm	0.15-0.35 mm/U	455 ●	391 ●



FU - finishing of steel

Prod. Gr. 133

ORION® CCMT smoothing positive
ISO P

			Carbide type	
Machining conditions for indexable insert			OHC6620	
			Medium	
Vc in steel ●			170-450 m/min	
Vc in cast iron ●			200-300 m/min	
ISO name	min./max. ap	f min./max.	17863... Ident. No.	
CCMT 060202-FP3	0.1-1.5 mm	0.2-0.1 mm/U	380 ●	●
CCMT 060204-FP3	0.1-1.5 mm	0.05-0.15 mm/U	382 ●	●
CCMT 09T304-FP3	0.4-3 mm	0.1-0.3 mm/U	386 ●	●



FP - finishing

Prod. Gr. 133

ORION® CCMT medium machining positive
ISO P

			Carbide type		
Machining conditions for indexable insert			OHC7615	OHC7625	OHC7635
			Good	Medium	Unfavourable
Vc in steel ●			180-330 m/min	150-360 m/min	155-235 m/min
Vc in stainless steel ●				90-215 m/min	90-140 m/min
Vc in cast iron ●			170-310 m/min		
Vc in special alloys ●				40-105 m/min	
ISO name	min./max. ap	f min./max.	17863... Ident. No.	17863... Ident. No.	17863... Ident. No.
CCMT 060204-MU	0.4-2.5 mm	0.1-0.2 mm/U	392 ●	456 ●	491 ●
CCMT 09T304-MU	1-4 mm	0.15-0.3 mm/U	- -	457 ●	492 ●
CCMT 09T308-MU	1.5-4 mm	0.15-0.35 mm/U	- -	458 ●	493 ●
CCMT 120408-MU	1.5-4.5 mm	0.15-0.35 mm/U	- -	459 ●	494 ●



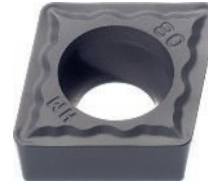
MU - medium machining of steel

Prod. Gr. 133

ORION® CCMT medium machining positive

ISO P

			Carbide type	OHC6620
			Machining conditions for indexable insert	Medium
			Vc in steel ●	170-450 m/min
			Vc in cast iron ●	200-300 m/min
ISO name	min./max. ap	f min./max.	17863... Ident. No.	
CCMT 060204-MP3	0.5-2.5 mm	0.1-0.25 mm/U	190	●
CCMT 09T304-MP3	0.4-3 mm	0.1-0.25 mm/U	192	●
CCMT 09T308-MP3	0.4-3 mm	0.1-0.32 mm/U	194	●
CCMT 120408-MP3	0.6-3.5 mm	0.05-0.3 mm/U	196	●



MP – medium machining



Prod. Gr. 133

ORION® CCMW medium machining positive

ISO P

			Carbide type	OHC6605
			Machining conditions for indexable insert	Good
			Vc in steel ●	170-450 m/min
			Vc in cast iron ●	160-400 m/min
			Vc in hardened steel ●	30-90 m/min
ISO name	min./max. ap	f min./max.	17996... Ident. No.	
CCMW 60202	0.1-1.5 mm	0.05-0.2 mm/U	014	●
CCMW 060204	0.1-1.5 mm	0.05-0.2 mm/U	015	●
CCMW 09T304	0.1-1.5 mm	0.05-0.2 mm/U	020	●
CCMW 09T308	0.1-1.5 mm	0.05-0.2 mm/U	025	●
CCMW 120404	0.1-1.5 mm	0.05-0.2 mm/U	030	●
CCMW 120408	0.1-1.5 mm	0.05-0.2 mm/U	035	●



OHC6605 medium machining for hard materials up to 55 HRC

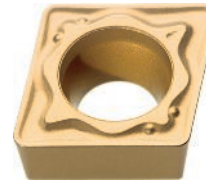


Prod. Gr. 133

ORION® CCMT medium machining positive

ISO M

			Carbide type	OHC7515	OHC7530	OHC7535
			Machining conditions for indexable insert	Good	Medium	Unfavourable
			Vc in steel ●	145-350 m/min	145-230 m/min	115-265 m/min
			Vc in stainless steel ●	85-210 m/min	85-135 m/min	65-155 m/min
			Vc in special alloys ●	35-105 m/min	25-65 m/min	25-75 m/min
ISO name	min./max. ap	f min./max.	17863... Ident. No.	17863... Ident. No.	17863... Ident. No.	
CCMT 060204-MU	0.4-1.5 mm	0.08-0.2 mm/U	163	●	460	●
CCMT 09T304-MU	0.4-3 mm	0.1-0.35 mm/U	164	●	461	●
CCMT 09T308-MU	0.8-3 mm	0.15-0.35 mm/U	165	●	462	●
CCMT 120408-MU	0.8-4 mm	0.15-0.35 mm/U	166	●	463	●
CCMT 120412-MU	1.2-4 mm	0.15-0.45 mm/U	-	-	464	-



MU – medium machining of stainless steel



Prod. Gr. 133

ORION® CCMT medium machining positive

ISO M

			Carbide type	OHC7520
			Machining conditions for indexable insert	Medium
			Vc in stainless steel ●	80-240 m/min
			Vc in special alloys ●	30-60 m/min
ISO name	min./max. ap	f min./max.	17863... Ident. No.	
CCMT 060204-MM3	0.2-2.5 mm	0.06-0.2 mm/U	630	●
CCMT 09T304-MM3	0.22-3.2 mm	0.08-0.25 mm/U	632	●



MM – medium machining



Prod. Gr. 133

ORION® CCMT medium machining positive

ISO K

Machining conditions for indexable insert			Carbide type	OHC6410
			Good	
Vc in steel ●			170-320 m/min	
Vc in cast iron ●			220-400 m/min	
ISO name	min./max. ap	f min./max.	17863... Ident. No.	
CCMT 060204-MK3	0.2-2.4 mm	0.06-0.2 mm/U	502	●
CCMT 060208-MK3	0.2-2.4 mm	0.08-0.25 mm/U	506	●
CCMT 09T304-MK3	0.3-3 mm	0.06-0.2 mm/U	510	●
CCMT 09T308-MK3	0.5-3 mm	0.08-0.25 mm/U	514	●



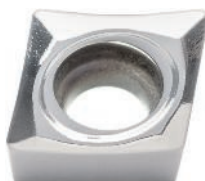
MK - medium machining

Prod. Gr. 133

ORION® CCGT medium machining positive

ISO N

Machining conditions for indexable insert			Carbide type	110-600 m/min
			Good	
Vc in non-ferrous metals ●			110-600 m/min	
ISO name	min./max. ap	f min./max.	17863... Ident. No.	
CCGT 060202-MN4	0.2-3 mm	0.05-0.15 mm/U	626	●
CCGT 060204-MN4	0.5-3 mm	0.1-0.3 mm/U	634	●
CCGT 09T304-MN4	0.5-5 mm	0.1-0.3 mm/U	642	●



MN medium machining

Prod. Gr. 133

ORION® CCGT medium machining positive

ISO N

Machining conditions for indexable insert			Carbide type	OHC6310
			Good	
Vc in non-ferrous metals ●			110-600 m/min	
Vc in stainless steel ●			75-110 m/min	
ISO name	min./max. ap	f min./max.	17863... Ident. No.	
CCGT 060202-MN4	0.2-3 mm	0.05-0.15 mm/U	628	●
CCGT 060204-MN4	0.5-3 mm	0.1-0.3 mm/U	636	●
CCGT 09T304-MN4	0.5-5 mm	0.1-0.3 mm/U	644	●



MN medium machining

Prod. Gr. 133

ORION® DCMT smoothing positive

ISO P

Machining conditions for indexable insert			Carbide type	OHC6620	OHC6610
			Medium	Good	
Vc in steel ●			170-450 m/min	200-380 m/min	
Vc in cast iron ●			140-260 m/min	200-300 m/min	
ISO name	min./max. ap	f min./max.	17864... Ident. No.	17864... Ident. No.	
DCMT 11T302-FP3	0.08-2 mm	0.04-0.18 mm/U	192	-	●
DCMT 11T304-FP3	0.08-2.5 mm	0.05-0.3 mm/U	-	205	●
DCMT 070204-FP3	0.08-1.5 mm	0.05-0.15 mm/U	190	-	-



FP finishing

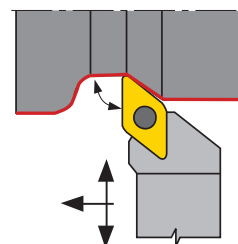
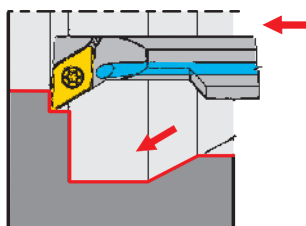


Prod. Gr. 133



DC.. Indexable inserts - for longitudinal and copy turning

For longitudinal and copy turning



ORION® DCMT medium machining positive
ISO P

			Carbide type		OHC7615	OHC7625
Machining conditions for indexable insert			Good		Medium	
Vc in steel ●			160-270 m/min		170-315 m/min	
Vc in stainless steel ●			150-255 m/min		100-185 m/min	
Vc in cast iron ●			150-255 m/min		160-295 m/min	
Vc in special alloys ●			150-255 m/min		30-90 m/min	
ISO name	min./max. ap	f min./max.	17864... Ident. No.		17864... Ident. No.	
DCMT 11T304-MU	0.4-3 mm	0.08-0.24 mm/U	269	●	273	●
DCMT 11T308-MU	0.8-3 mm	0.1-0.3 mm/U	270	●	274	●

Prod. Gr. 133



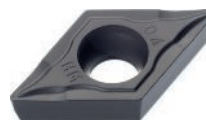
MU medium machining of steel



ORION® DCMT medium machining positive
ISO P

			Carbide type		OHC6620
Machining conditions for indexable insert			Medium		
Vc in steel ●			170-450 m/min		
Vc in cast iron ●			140-260 m/min		
ISO name	min./max. ap	f min./max.	17864... Ident. No.		
DCMT 070204-MP3	0.5-2.5 mm	0.1-0.20 mm/U	176	●	
DCMT 11T304-MP3	0.22-3 mm	0.05-0.3 mm/U	184	●	
DCMT 11T308-MP3	0.22-3 mm	0.08-0.08 mm/U	186	●	

Prod. Gr. 133



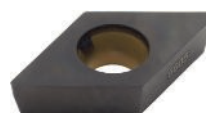
MP medium machining



ORION® DCMT medium machining positive
ISO P

			Carbide type		OHC6605
Machining conditions for indexable insert			Good		
Vc in steel ●			280-450 m/min		
Vc in cast iron ●			300-400 m/min		
Vc in hardened steel ●			50-90 m/min		
ISO name	min./max. ap	f min./max.	17996... Ident. No.		
DCMW 070202	0.1-1.5 mm	0.05-0.2 mm/U	050	●	
DCMW 070204	0.1-1.5 mm	0.05-0.2 mm/U	055	●	
DCMW 11T304	0.1-1.5 mm	0.05-0.2 mm/U	060	●	
DCMW 11T308	0.1-1.5 mm	0.05-0.2 mm/U	065	●	

Prod. Gr. 133



OHC6605 medium machining for hard materials up to 55 HRC



ORION® DCMT medium machining positive
ISO M

			Carbide type		OHC7515	OHC7530	OHC7535
Machining conditions for indexable insert			Good		Medium		Unfavourable
Vc in steel ●			120-310 m/min		110-195 m/min		100-230 m/min
Vc in stainless steel ●			70-185 m/min		65-115 m/min		60-135 m/min
Vc in special alloys ●			25-90 m/min		100-185 m/min		20-65 m/min
ISO name	min./max. ap	f min./max.	17864... Ident. No.		17864... Ident. No.		17864... Ident. No.
DCMT 11T304-MU	0.4-3 mm	0.1-0.24 mm/U	245	●	275	●	279
DCMT 11T308-MU	0.8-3 mm	0.1-0.3 mm/U	246	●	276	●	288

Prod. Gr. 133



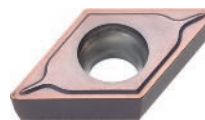
MU medium machining of stainless steel



ORION® DCMT medium machining positive

ISO M

			Carbide type	OHC7520
			Machining conditions for indexable insert	Medium
			Vc in stainless steel ●	80-240 m/min
			Vc in special alloys ●	30-60 m/min
ISO name	min./max. ap	f min./max.	17864... Ident. No.	
DCMT 11T304-MM3	0.25-3 mm	0.08-0.22 mm/U	234	●
DCMT 11T308-MM3	0.5-3.2 mm	0.1-0.35 mm/U	236	●



MM medium machining



MM3

Prod. Gr. 133

ORION® DCMT medium machining positive

ISO K

			Carbide type	OHC6410
			Machining conditions for indexable insert	Good
			Vc in steel ●	170-400 m/min
			Vc in cast iron ●	170-320 m/min
ISO name	min./max. ap	f min./max.	17864... Ident. No.	
DCMT 11T304-MK3	0.3-3 mm	0.06-0.2 mm/U	502	●
DCMT 11T308-MK3	0.5-3 mm	0.08-0.3 mm/U	506	●



MK medium machining



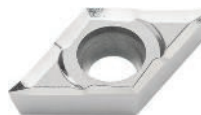
MK

Prod. Gr. 133

ORION® DCGT medium machining positive

ISO N

			Carbide type	OHW6310
			Machining conditions for indexable insert	Good
			Vc in non-ferrous metals ●	110-600 m/min
ISO name	min./max. ap	f min./max.	17864... Ident. No.	
DCGT 11T302-MN4	0.3-5 mm	0.05-0.15 mm/U	194	●
DCGT 11T304-MN4	0.5-5 mm	0.1-0.3 mm/U	196	●



MN medium machining



MN4

Prod. Gr. 133

ORION® DCGT medium machining positive

ISO N

			Carbide type	OHC6310
			Machining conditions for indexable insert	Good
			Vc in non-ferrous metals ●	110-600 m/min
			Vc in stainless steel ●	75-110 m/min
ISO name	min./max. ap	f min./max.	17864... Ident. No.	
DCGT 070202-MN4	0.3-4 mm	0.05-0.18 mm/U	191	●
DCGT 070204-MN4	0.5-4 mm	0.1-0.3 mm/U	193	●
DCGT 11T302-MN4	0.3-5 mm	0.05-0.15 mm/U	195	●
DCGT 11T304-MN4	0.5-5 mm	0.1-0.3 mm/U	197	●



MN medium machining



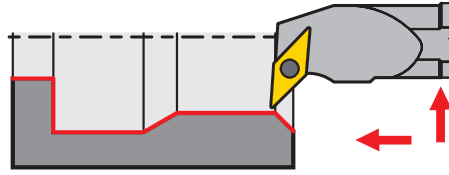
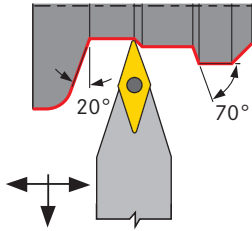
MN4

Prod. Gr. 133



VB.. Indexable inserts - for longitudinal and copy turning

For longitudinal and copy turning



ORION® VBMT smoothing positive

ISO P

		Carbide type		OHC7615	OHC7625
Machining conditions for indexable insert		Good		Medium	
Vc in steel ●		140-225 m/min		150-260 m/min	175-265 m/min
Vc in stainless steel ●		80-135 m/min		105-155 m/min	
Vc in cast iron ●		25-65 m/min		140-245 m/min	
f min./max.		0.10-0.20 mm/U		17863... Ident. No.	17863... Ident. No.
ISO name	min./max. ap			792 ●	794 ●
VBMT 160404-FU	0.4-2.0 mm			793 ●	795 ●
VBMT 160408-FU	0.8-2.8 mm	0.15-0.2 mm/U			



FU finishing of steel



Prod. Gr. 133

ORION® VBMT smoothing positive

ISO M

		Carbide type		OHC7515	OHC7530	OHC7535
Machining conditions for indexable insert		Good		Medium		Unfavourable
Vc in steel ●		140-225 m/min		110-160 m/min	95-185 m/min	
Vc in stainless steel ●		80-135 m/min		65-95 m/min	55-110 m/min	
Vc in special alloys ●		25-65 m/min		20-45 m/min	20-55 m/min	
f min./max.		0.1-0.2 mm/U		17863... Ident. No.	17863... Ident. No.	17863... Ident. No.
ISO name	min./max. ap			798 ●	801 ●	806 ●
VBMT 160404-FU	0.4-2 mm			799 ●	803 ●	807 ●
VBMT 160408-FU	0.8-2.5 mm	0.15-0.35 mm/U				



FU finishing of stainless steel

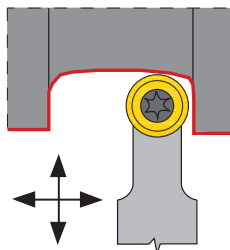


Prod. Gr. 133



RC.. Indexable inserts - for longitudinal and copy turning

For longitudinal and copy turning



ORION® RCMT medium machining positive

ISO N

Machining conditions for indexable insert			Carbide type	OHW6310
			Medium	Medium
Vc in non-ferrous metals			●	95-680 m/min
ISO name	min./max. ap	f min./max.	17865...	Ident. No.
RCGT 803 MN	0.8-3.0 mm	0.2-1.5 mm/U	750	●
RCGT 1003 MN	1.0-4.0 mm	0.2-2.0 mm/U	752	●

Prod. Gr. 133

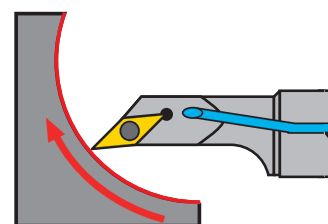
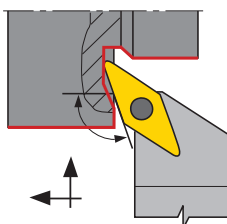


MN – medium machining



VC.. Indexable inserts - for longitudinal and copy turning

For longitudinal and copy turning



ORION® VCMT smoothing positive

ISO P

Machining conditions for indexable insert			Carbide type	OHC7625
			Medium	Medium
Vc in steel			●	115-195 m/min
Vc in stainless steel			●	65-115 m/min
Vc in cast iron			●	65-115 m/min
ISO name	min./max. ap	f min./max.	17866...	Ident. No.
VCMT 110304-FU	0.5-2.8 mm	0.15-0.2 mm/U	761	●
VCMT 160404-FU	0.5-3 mm	0.15-0.2 mm/U	762	●

Prod. Gr. 133



FU finishing of steel



ORION® VCMT medium machining positive

ISO P

Machining conditions for indexable insert			Carbide type	OHC7625
			Medium	Medium
Vc in steel			●	115-195 m/min
Vc in stainless steel			●	65-115 m/min
Vc in cast iron			●	65-115 m/min
ISO name	min./max. ap	f min./max.	17866...	Ident. No.
VCMT 160404-MU	0.5-4 mm	0.15-0.2 mm/U	763	●
VCMT 160408-MU	0.8-4 mm	0.15-0.4 mm/U	765	●

Prod. Gr. 133



MU medium machining of steel



ORION® VCMT smoothing positive

ISO M

			Carbide type	OHC7530
			Machining conditions for indexable insert	Medium
			Vc in steel ●	70-120 m/min
			Vc in stainless steel ●	40-70 m/min
			Vc in special alloys ●	30-50 m/min
ISO name	min./max. ap	f min./max.	17866... Ident. No.	
VCMT 110304-FU	0.8-2.8 mm	0.15-0.24 mm/U	780	●

Prod. Gr. 133



SM finishing



ORION® VCMT medium machining positive

ISO M

			Carbide type	OHC7530
			Machining conditions for indexable insert	Medium
			Vc in steel ●	70-120 m/min
			Vc in stainless steel ●	40-70 m/min
			Vc in special alloys ●	30-50 m/min
ISO name	min./max. ap	f min./max.	17866... Ident. No.	
VCMT 160404-MU	0.5-4 mm	0.15-0.2 mm/U	782	●

Prod. Gr. 133

MU medium machining
of stainless steel

ORION® VCGT medium machining positive

ISO N

			Carbide type	OHC6310	OHW6310
			Machining conditions for indexable insert	Good	Good
			Vc in non-ferrous metals ●	110-600 m/min	110-600 m/min
			Vc in stainless steel ●	75-110 m/min	
ISO name	min./max. ap	f min./max.	17866... Ident. No.		17866... Ident. No.
VCGT 110302-MN4	0.3-3 mm	0.05-0.15 mm/U	251	●	-
VCGT 160404-MN4	0.5-3 mm	0.1-0.3 mm/U	-	-	254 ●

Prod. Gr. 133



MN medium machining



ORION® VCGT medium machining positive

ISO N

			Carbide type	OHC6310
			Machining conditions for indexable insert	Good
			Vc in non-ferrous metals ●	110-600 m/min
			Vc in stainless steel ●	75-110 m/min
ISO name	min./max. ap	f min./max.	17866... Ident. No.	
VCGT 160404-MN4	0.5-3 mm	0.1-0.3 mm/U	255	●

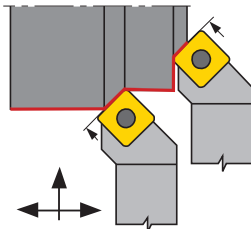
Prod. Gr. 133





SC.. Indexable inserts - for longitudinal turning and facing

For longitudinal turning and facing



ORION® SCMT medium machining positive

ISO P

			Carbide type	
Machining conditions for indexable insert			OHC7615	OHC7625
			Good	Medium
Vc in steel ●			190-350 m/min	225-375 m/min
Vc in stainless steel ●				120-225 m/min
Vc in cast iron ●			180-330 m/min	190-355 m/min
ISO name	min./max. ap	f min./max.	17867... Ident. No.	17867... Ident. No.
SCMT 09T304-MU	0.4-3 mm	0.1-0.3 mm/U	636 ●	640 ●
SCMT 09T308-MU	0.8-3 mm	0.15-0.35 mm/U	637 ●	644 ●
SCMT 120408-MU	0.8-4 mm	0.15-0.35 mm/U	638 ●	646 ●

Prod. Gr. 133



MU medium machining of steel

ORION® SCMT medium machining positive

ISO M

			Carbide type		
Machining conditions for indexable insert			OHC7515	OHC7530	OHC7535
			Good	Medium	Unfavourable
Vc in steel ●			165-295 m/min	135-230 m/min	120-235 m/min
Vc in stainless steel ●			95-175 m/min	80-135 m/min	75-140 m/min
Vc in special alloys ●			30-85 m/min	30-65 m/min	25-65 m/min
ISO name	min./max. ap	f min./max.	17867... Ident. No.	17867... Ident. No.	17867... Ident. No.
SCMT 09T304-MU	0.4-3 mm	0.1-0.3 mm/U	651 ●	660 ●	661 ●
SCMT 09T308-MU	0.8-3 mm	0.15-0.35 mm/U	652 ●	662 ●	663 ●
SCMT 120404-MU	0.4-4 mm	0.1-0.3 mm/U	653 ●	664 ●	-
SCMT 120408-MU	0.8-4 mm	0.15-0.35 mm/U	655 ●	666 ●	667 ●

Prod. Gr. 133



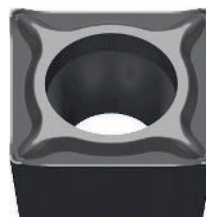
MU medium machining of stainless steel

ORION® SCMT medium machining positive

ISO K

			Carbide type	
Machining conditions for indexable insert			OHC6410	
			Good	
Vc in steel ●			170-320 m/min	
Vc in cast iron ●			220-400 m/min	
ISO name	min./max. ap	f min./max.	17867... Ident. No.	
SCMT 09T308-MK	0.3-3.5 mm	0.08-0.25 mm/U	506 ●	

Prod. Gr. 133



MK medium machining

ORION® SCMT medium machining positive

ISO K

			Carbide type	OHC6410
			Machining conditions for indexable insert	Good
			Vc in steel ●	170-320 m/min
			Vc in cast iron ●	220-400 m/min
ISO name	min./max. ap	f min./max.	17867... Ident. No.	
SCMT 120408-RK	0.5-4 mm	0.1-0.4 mm/U	510	●

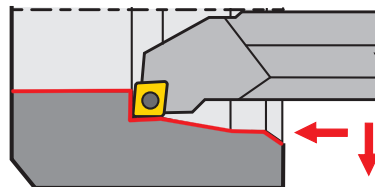
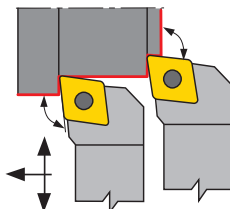
Prod. Gr. 133



RK - rough machining

i CN.. Indexable inserts - for longitudinal turning and facing

For longitudinal turning and facing



ORION® CNMG medium machining negative

ISO P

			Carbide type	OHC7615	OHC7625
			Machining conditions for indexable insert	Good	Medium
			Vc in steel ●	200-370 m/min	170-380 m/min
			Vc in stainless steel ●		100-230 m/min
			Vc in cast iron ●	195-350 m/min	135-230 m/min
			Vc in special alloys ●		30-115 m/min
			Vc in hardened steel ●	40-65 m/min	
ISO name	min./max. ap	f min./max.	17863... Ident. No.		17863... Ident. No.
CNMG 120404-MU	0.5-3 mm	0.15-0.3 mm/U	197	●	470
CNMG 120408-MU	0.8-3 mm	0.15-0.45 mm/U	198	●	471
CNMG 120412-MU	1.2-4 mm	0.15-0.45 mm/U	199	●	472

Prod. Gr. 133



MU - medium machining of steel

ORION® CNMG medium machining negative

ISO P

			Carbide type	OHC6620
			Machining conditions for indexable insert	Medium
			Vc in steel ●	180-350 m/min
			Vc in cast iron ●	120-220 m/min
ISO name	min./max. ap	f min./max.	17863... Ident. No.	
CNMG 120404-MP3	0.4-5 mm	0.15-0.35 mm/U	430	●
CNMG 120408-MP3	0.5-5 mm	0.15-0.4 mm/U	432	●

Prod. Gr. 133



RP - rough machining

ORION® CNMG medium machining negative
ISO P

			Carbide type	OHC7625
			Machining conditions for indexable insert	Medium
			Vc in steel ●	245-370 m/min
			Vc in stainless steel ●	145-220 m/min
			Vc in cast iron ●	230-350 m/min
			Vc in special alloys ●	45-110 m/min
ISO name	min./max. ap	f min./max.	17863... Ident. No.	
CNMG 120404 MW-ER	0.8-5 mm	0.2-0.3 mm/U	077	●
CNMG 120408 MW-ER	0.8-5 mm	0.2-0.3 mm/U	078	●

Prod. Gr. 133



OHC7625 highly positive chip breaker, steel

ORION® CNMG medium machining negative
ISO P

			Carbide type	OHC7625
			Machining conditions for indexable insert	Medium
			Vc in steel ●	245-370 m/min
			Vc in stainless steel ●	145-220 m/min
			Vc in cast iron ●	230-350 m/min
			Vc in special alloys ●	45-110 m/min
ISO name	min./max. ap	f min./max.	17863... Ident. No.	
CNMG 120404 MW-EL	0.8-5 mm	0.2-0.3 mm/U	079	●
CNMG 120408 MW-EL	0.8-5 mm	0.2-0.3 mm/U	146	●

Prod. Gr. 133

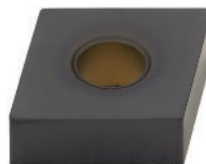


OHC7625 highly positive chip breaker, steel

ORION® CNMA medium machining negative
ISO P

			Carbide type	OHC6605
			Machining conditions for indexable insert	Good
			Vc in steel ●	170-450 m/min
			Vc in cast iron ●	160-400 m/min
			Vc in hardened steel ●	30-90 m/min
ISO name	min./max. ap	f min./max.	17996... Ident. No.	
CNMA 120404	0.1-1.5 mm	0.05-0.2 mm/U	040	●
CNMA 120408	0.1-1.5 mm	0.05-0.2 mm/U	045	●
CNMA 120412	0.1-1.5 mm	0.05-0.2 mm/U	046	●
CNMA 120416	0.1-1.5 mm	0.05-0.2 mm/U	047	●
CNMA 160612	0.1-1.5 mm	0.05-0.2 mm/U	048	●
CNMA 190612	0.1-1.5 mm	0.05-0.2 mm/U	049	●

Prod. Gr. 133

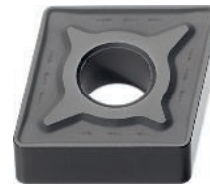


OHC6605 medium machining for hard materials up to 55 HRC

ORION® CNMG rough machining negative ISO P

Carbide type			OHC7615	OHC7625	OHC7635
Machining conditions for indexable insert			Good	Medium	Unfavourable
Vc in steel ●			200-370 m/min	170-380 m/min	150-280 m/min
Vc in stainless steel ●				100-230 m/min	90-165 m/min
Vc in cast iron ●			195-350 m/min	135-230 m/min	
Vc in special alloys ●				30-115 m/min	
Vc in hardened steel ●			40-65 m/min		
ISO name	min./max. ap	f min./max.	17863... Ident. No.	17863... Ident. No.	17863... Ident. No.
CNMG 120408-RU	1-7 mm	0.2-0.5 mm/U	201 ●	473 ●	504 ●
CNMG 120412-RU	1.2-7 mm	0.25-0.7 mm/U	202 ●	474 ●	505 ●
CNMG 160608-RU	1-8 mm	0.2-0.5 mm/U	203 ●	475 ●	507 ●
CNMG 160612-RU	1.2-8 mm	0.3-0.7 mm/U	204 ●	476 ●	508 ●

Prod. Gr. 133



RU - rough machining of steel



ORION® CNMG rough machining negative ISO P

Carbide type			OHC6620
Machining conditions for indexable insert			Medium
Vc in steel ●			180-350 m/min
Vc in cast iron ●			120-220 m/min
ISO name	min./max. ap	f min./max.	17863... Ident. No.
CNMG 120408-RP3	0.6-6.5 mm	0.2-0.6 mm/U	450 ●

Prod. Gr. 133



RP - rough machining



ORION® CNMM rough machining negative ISO P

Carbide type			OHC7615	OHC7625	OHC7635
Machining conditions for indexable insert			Good	Medium	Unfavourable
Vc in steel ●			150-300 m/min	135-300 m/min	105-240 m/min
Vc in stainless steel ●				80-170 m/min	60-140 m/min
Vc in cast iron ●			140-285 m/min	125-270 m/min	
Vc in special alloys ●				25-85 m/min	
ISO name	min./max. ap	f min./max.	17870... Ident. No.	17870... Ident. No.	17870... Ident. No.
CNMM 120408 RP1	2-8 mm	0.25-0.6 mm/U	600 ●	601 ●	602 ●
CNMM 120412 RP1	2.5-8 mm	0.3-0.7 mm/U	603 ●	604 ●	605 ●
CNMM 120416 RP1	2.5-8 mm	0.35-0.8 mm/U	606 ●	607 ●	608 ●
CNMM 160608 RP1	3-8 mm	0.3-0.6 mm/U	609 ●	610 ●	611 ●
CNMM 160612 RP1	3-10 mm	0.35-0.9 mm/U	612 ●	613 ●	-
CNMM 160616 RP1	3-10 mm	0.36-1 mm/U	615 ●	616 ●	-
CNMM 190612 RP1	3-10 mm	0.35-0.9 mm/U	617 ●	618 ●	619 ●
CNMM 190616 RP1	3-10 mm	0.37-1.2 mm/U	620 ●	621 ●	622 ●
CNMM 190624 RP1	3-12 mm	0.38-1.25 mm/U	623 ●	624 ●	-
CNMM 250924 RP1	4-16 mm	0.45-1.7 mm/U	625 ●	626 ●	627 ●

Prod. Gr. 133



RP1 rough machining of single-sided panel, steel



ORION® CNMM rough machining negative
ISO M

			Carbide type	OHC7625
Machining conditions for indexable insert			Medium	
			Vc in steel ●	135-300 m/min
			Vc in stainless steel ●	80-170 m/min
			Vc in cast iron ●	125-270 m/min
			Vc in special alloys ●	25-85 m/min
ISO name	min./max. ap	f min./max.	17870... Ident. No.	
CNMM 120408-RM1	0.8-7.5 mm	0.25-0.55 mm/U	630	●
CNMM 120412-RM1	1.2-7.5 mm	0.28-0.70 mm/U	631	●
CNMM 160608-RM1	1-9.5 mm	0.30-0.60 mm/U	632	●
CNMM 160612-RM1	1.5-9.5 mm	0.35-0.65 mm/U	633	●
CNMM 160616-RM1	2-9.5 mm	0.35-0.80 mm/U	634	●
CNMM 190612-RM1	1.5-12 mm	0.35-0.9 mm/U	635	●
CNMM 190616-RM1	2-12 mm	0.4-1.0 mm/U	636	●
CNMM 190624-RM1	2.5-12 mm	0.4-1.2 mm/U	637	●
CNMM 250924-RM1	3-16 mm	0.5-1.6 mm/U	638	●



RM1 rough machining of single-sided panel, stainless steel

Prod. Gr. 133

ORION® CNMG medium machining negative
ISO M

			Carbide type	OHC7515	OHC7530
Machining conditions for indexable insert			Good		Medium
			Vc in steel ●	180-305 m/min	145-245 m/min
			Vc in stainless steel ●	105-180 m/min	85-145 m/min
			Vc in special alloys ●	20-60 m/min	25-70 m/min
ISO name	min./max. ap	f min./max.	17863... Ident. No.		17863... Ident. No.
CNMG 120404-MU	0.5-3 mm	0.1-0.3 mm/U	279	●	477
CNMG 120408-MU	0.8-3 mm	0.15-0.45 mm/U	280	●	478



RU medium machining of stainless steel

Prod. Gr. 133

ORION® CNMG medium machining negative
ISO M

			Carbide type	OHC7520
Machining conditions for indexable insert			Medium	
			Vc in stainless steel ●	160-220 m/min
			Vc in special alloys ●	30-90 m/min
ISO name	min./max. ap	f min./max.	17863... Ident. No.	
CNMG 120408-MM3	0.5-5 mm	0.12-0.45 mm/U	573	●
CNMG 160608-MM3	0.5-7 mm	0.12-0.4 mm/U	579	●
CNMG 160612-MM3	1-7 mm	0.15-0.6 mm/U	581	●



MM - medium machining

Prod. Gr. 133

ORION® CNMG medium machining negative
ISO M

			Carbide type	OHC7525
Machining conditions for indexable insert			Medium	
			Vc in steel ●	165-255 m/min
			Vc in non-ferrous metals ●	245-890 m/min
			Vc in stainless steel ●	95-150 m/min
			Vc in cast iron ●	155-240 m/min
			Vc in special alloys ●	30-75 m/min
ISO name	min./max. ap	f min./max.	17863... Ident. No.	
CNMG 120404 MW-ER	0.8-5 mm	0.2-0.3 mm/U	148	●
CNMG 120408 MW-ER	0.8-5 mm	0.2-0.3 mm/U	182	●



OHC7525 highly positive chip breaker, stainless steel

Prod. Gr. 133

ORION® CNMG medium machining negative
ISO M

			Carbide type	OHC7525
Machining conditions for indexable insert			Good	Medium
Vc in steel ●			180-305 m/min	165-255 m/min
Vc in non-ferrous metals ●			105-180 m/min	245-890 m/min
Vc in stainless steel ●			105-180 m/min	95-150 m/min
Vc in cast iron ●			20-60 m/min	155-240 m/min
Vc in special alloys ●			20-60 m/min	30-75 m/min
ISO name	min./max. ap	f min./max.	17863... Ident. No.	
CNMG 120404 MW-EL	0.8-5 mm	0.2-0.3 mm/U	181	●
CNMG 120408 MW-EL	0.8-5 mm	0.2-0.3 mm/U	184	●

Prod. Gr. 133



OHC7525 highly positive chip breaker, stainless steel



ORION® CNMG rough machining negative
ISO M

			Carbide type	OHC7515	OHC7530	OHC7535
Machining conditions for indexable insert			Good	Medium	Unfavourable	
Vc in steel ●			180-305 m/min	145-245 m/min	120-255 m/min	
Vc in stainless steel ●			105-180 m/min	85-145 m/min	70-150 m/min	
Vc in special alloys ●			20-60 m/min	25-70 m/min	25-75 m/min	
ISO name	min./max. ap	f min./max.	17863... Ident. No.	17863... Ident. No.	17863... Ident. No.	
CNMG 120408-RU	1-7 mm	0.2-0.5 mm/U	281	●	-	512 ●
CNMG 120412-RU	1.5-7 mm	0.25-0.7 mm/U	282	●	481 ●	513 ●
CNMG 160608-RU	1-8 mm	0.2-0.5 mm/U	-	-	482 ●	515 ●
CNMG 160612-RU	1.5-8 mm	0.3-0.7 mm/U	-	-	483 ●	519 ●

Prod. Gr. 133



RU - rough machining of stainless steel



ORION® CNMM rough machining negative
ISO M

			Carbide type	OHC7525
Machining conditions for indexable insert			Good	Medium
Vc in steel ●			180-305 m/min	90-260 m/min
Vc in stainless steel ●			105-180 m/min	50-155 m/min
ISO name	min./max. ap	f min./max.	17870... Ident. No.	
CNMM 120408-RM1	0.8-7.5 mm	0.25-0.55 mm/U	640	●
CNMM 120412-RM1	1.2-7.5 mm	0.28-0.70 mm/U	641	●
CNMM 160608-RM1	1-9.5 mm	0.30-0.60 mm/U	642	●
CNMM 160612-RM1	1.5-9.5 mm	0.35-0.65 mm/U	643	●
CNMM 160616-RM1	2-9.5 mm	0.35-0.80 mm/U	644	●
CNMM 190612-RM1	1.5-12 mm	0.35-0.9 mm/U	645	●
CNMM 190616-RM1	2-12 mm	0.4-1.0 mm/U	646	●
CNMM 190624-RM1	2.5-12 mm	0.4-1.2 mm/U	647	●
CNMM 250924-RM1	3-16 mm	0.5-1.6 mm/U	648	●

Prod. Gr. 133



RM1 rough machining of single-sided panel, stainless steel



ORION® CNMG medium machining negative
ISO K

			Carbide type	OHC6410	OHC6420
Machining conditions for indexable insert			Good	Medium	
Vc in steel ●			200-300 m/min	160-260 m/min	
Vc in cast iron ●			200-300 m/min	120-230 m/min	
ISO name	min./max. ap	f min./max.	17863... Ident. No.	17863... Ident. No.	
CNMG 120404-MK3	0.5-2.5 mm	0.1-0.3 mm/U	532	●	-
CNMG 120408-MK3	0.5-5 mm	0.2-0.4 mm/U	536	●	537 ●
CNMG 190612-MK3	0.8-8 mm	0.2-0.5 mm/U	559	●	-

Prod. Gr. 133

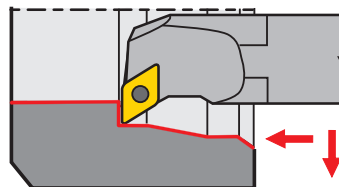
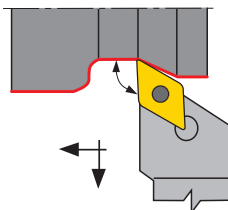


MK - medium machining





DN.. Indexable inserts - for longitudinal and copy turning
For longitudinal and copy turning



ORION® DNMG medium machining negative
ISO P

			Carbide type		OHC7615		OHC7625		OHC7635	
Machining conditions for indexable insert			Good		Medium		Unfavourable			
Vc in steel ●			170-295 m/min		180-275 m/min		130-225 m/min			
Vc in stainless steel ●					105-180 m/min		75-135 m/min			
Vc in cast iron ●			160-280 m/min		170-285 m/min					
Vc in special alloys ●					35-80 m/min					
Vc in hardened steel ●			30-55 m/min							
ISO name	min./max. ap	f min./max.	17864... Ident. No.		17864... Ident. No.		17864... Ident. No.			
DNMG 110404-MU	0.4-3 mm	0.15-0.24 mm/U	253	●	280	●	311	●		
DNMG 110408-MU	0.5-3 mm	0.15-0.24 mm/U	254	●	281	●	312	●		
DNMG 150604-MU	0.5-3 mm	0.15-0.24 mm/U	255	●	282	●	313	●		
DNMG 150608-MU	0.8-3 mm	0.15-0.45 mm/U	256	●	283	●	315	●		



MU medium machining of steel



Prod. Gr. 133

ORION® DNMG medium machining negative
ISO P

			Carbide type		OHC7625	
Machining conditions for indexable insert			Medium			
Vc in steel ●			200-295 m/min			
Vc in stainless steel ●			120-175 m/min			
Vc in cast iron ●			190-280 m/min			
Vc in special alloys ●			40-85 m/min			
ISO name	min./max. ap	f min./max.	17864... Ident. No.			
DNMG 150604 MW-ER	0.8-4.5 mm	0.2-0.24 mm/U	406	●		
DNMG 150608 MW-ER	0.8-4.5 mm	0.2-0.48 mm/U	400	●		



OHC7625 highly positive chip breaker, steel



Prod. Gr. 133

ORION® DNMG medium machining negative
ISO P

			Carbide type		OHC7625	
Machining conditions for indexable insert			Medium			
Vc in steel ●			200-295 m/min			
Vc in stainless steel ●			120-175 m/min			
Vc in cast iron ●			190-280 m/min			
Vc in special alloys ●			40-85 m/min			
ISO name	min./max. ap	f min./max.	17864... Ident. No.			
DNMG 150604 MW-EL	0.8-4.5 mm	0.2-0.24 mm/U	399	●		
DNMG 150608 MW-EL	0.8-4.5 mm	0.2-0.48 mm/U	401	●		



OHC7625 highly positive chip breaker, steel

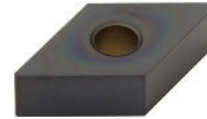


Prod. Gr. 133

ORION® DNMA medium machining negative

ISO P

			Carbide type		OHC6605
Machining conditions for indexable insert			Good		Good
Vc in steel ●			280-450 m/min		
Vc in cast iron ●			300-400 m/min		
Vc in hardened steel ●			50-90 m/min		
ISO name	min./max. ap	f min./max.	17996... Ident. No.		
DNMA 150604	0.1-1.5 mm	0.05-0.2 mm/U	070	●	
DNMA 150608	0.1-1.5 mm	0.05-0.2 mm/U	075	●	



OHC6605 medium machining for hard materials up to 55 HRC

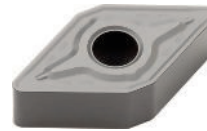


Prod. Gr. 133

ORION® DNMG rough machining negative

ISO P

			Carbide type		OHC7615	OHC7625	OHC7635	
Machining conditions for indexable insert			Good		Good	Medium	Unfavourable	
Vc in steel ●			170-295 m/min		180-275 m/min	130-225 m/min		
Vc in stainless steel ●			160-280 m/min		105-180 m/min	75-135 m/min		
Vc in cast iron ●			30-55 m/min		170-285 m/min			
Vc in special alloys ●					35-80 m/min			
Vc in hardened steel ●								
ISO name	min./max. ap	f min./max.	17864... Ident. No.		17864... Ident. No.		17864... Ident. No.	
DNMG 110408 RU	1-3.3 mm	0.2-0.48 mm/U	058	●	059	●	060	●
DNMG 110412 RU	1.5-3.3 mm	0.25-0.6 mm/U	070	●	071	●	076	●
DNMG 150608 RU	1-4.5 mm	0.2-0.48 mm/U	088	●	089	●	090	●
DNMG 150612 RU	1.5-4.5 mm	0.25-0.7 mm/U	091	●	092	●	093	●
DNMG 150616 RU	2-4.5 mm	0.3-0.75 mm/U	094	●	095	●	096	●



RU - rough machining of steel

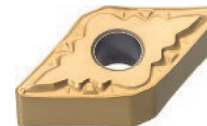


Prod. Gr. 133

ORION® DNMG medium machining negative

ISO M

			Carbide type		OHC7515	OHC7530	OHC7535	
Machining conditions for indexable insert			Good		Good	Medium	Unfavourable	
Vc in steel ●			145-300 m/min		125-215 m/min	115-215 m/min		
Vc in stainless steel ●			85-180 m/min		75-125 m/min	65-125 m/min		
Vc in special alloys ●			25-90 m/min		25-60 m/min			
ISO name	min./max. ap	f min./max.	17864... Ident. No.		17864... Ident. No.		17864... Ident. No.	
DNMG 110404-MU	0.4-3 mm	0.1-0.24 mm/U	257	●	284	●	316	●
DNMG 110408-MU	0.8-3 mm	0.1-0.35 mm/U	258	●	285	●	317	●
DNMG 150604-MU	0.5-3 mm	0.1-0.24 mm/U	259	●	286	●	318	●
DNMG 150608-MU	0.8-3 mm	0.15-0.45 mm/U	260	●	287	●	319	●



MU medium machining of stainless steel



Prod. Gr. 133

ORION® DNMG medium machining negative

ISO M

			Carbide type		OHC7525
Machining conditions for indexable insert			Unfavourable		Unfavourable
Vc in steel ●			155-260 m/min		
Vc in stainless steel ●			90-155 m/min		
ISO name	min./max. ap	f min./max.	17864... Ident. No.		
DNMG 150604 MW-ER	0.8-4.5 mm	0.2-0.24 mm/U	402	●	
DNMG 150608 MW-ER	0.8-4.5 mm	0.2-0.48 mm/U	404	●	



OHC7525 highly positive chip breaker, stainless steel



Prod. Gr. 133



ORION DNMG medium machining negative
ISO M

			Carbide type	OHC7525
			Machining conditions for indexable insert	Unfavourable
			Vc in steel ●	155-260 m/min
			Vc in stainless steel ●	90-155 m/min
ISO name	min./max. ap	f min./max.	17864...	
			Ident. No.	●
DNMG 150604 MW-EL	0.8-4.5 mm	0.2-0.24 mm/U	403	●
DNMG 150608 MW-EL	0.8-4.5 mm	0.2-0.48 mm/U	405	●

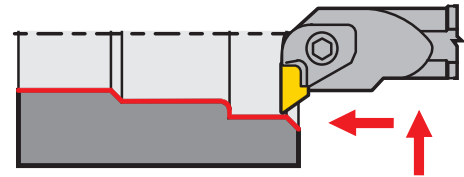
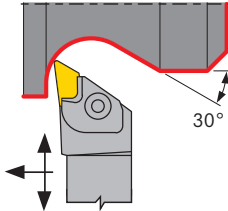
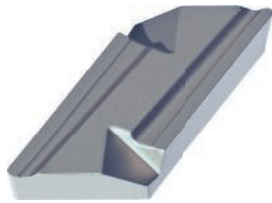


OHC7525 highly positive chip breaker, stainless steel



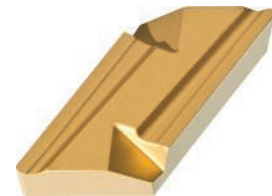
Prod. Gr. 133

i **KN.. Indexable inserts - for facing, longitudinal and copy turning**
For facing, longitudinal and copy turning



ORION KNUX indexable insert, negative
ISO P

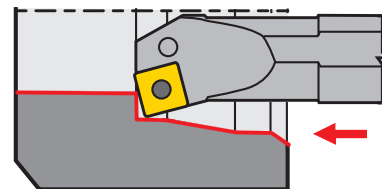
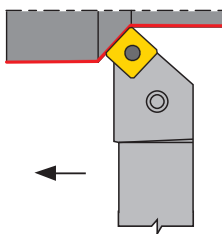
			Carbide type	OHC6620
			Machining conditions for indexable insert	Medium
			Vc in steel ●	70-350 m/min
			Vc in stainless steel ●	70-200 m/min
			Vc in cast iron ●	70-240 m/min
ISO name	min./max. ap	f min./max.	17869...	
			Ident. No.	●
KNUX 160405 L11	1-6 mm	0.15-0.35 mm/U	700	●
KNUX 160405 R11	1-6 mm	0.15-0.35 mm/U	701	●
KNUX 160405 L12	1-6 mm	0.15-0.35 mm/U	702	●
KNUX 160405 R12	1-6 mm	0.15-0.35 mm/U	703	●
KNUX 160410 L11	1-6 mm	0.15-0.35 mm/U	704	●
KNUX 160410 R11	1.5-6 mm	0.15-0.35 mm/U	705	●
KNUX 160410 L12	1.5-6 mm	0.15-0.35 mm/U	706	●
KNUX 160410 R12	1.5-6 mm	0.15-0.35 mm/U	707	●



11 - finishing chip breaker
12 - medium chip breaker

Prod. Gr. 133

i **SN.. Indexable inserts - for longitudinal turning and facing**
For longitudinal turning and facing



ORION SNMG medium machining negative
ISO P

			Carbide type	OHC7615	OHC7625
			Machining conditions for indexable insert	Good	Medium
			Vc in steel ●	175-400 m/min	240-400 m/min
			Vc in stainless steel ●	140-240 m/min	140-240 m/min
			Vc in cast iron ●	160-350 m/min	225-380 m/min
			Vc in special alloys ●	160-350 m/min	45-105 m/min
			Vc in hardened steel ●	50-70 m/min	
ISO name	min./max. ap	f min./max.	17867...	17867...	
			Ident. No.	Ident. No.	
SNMG 120404-MU	0.5-3 mm	0.15-0.3 mm/U	047	176	●
SNMG 120408-MU	0.8-3 mm	0.15-0.45 mm/U	048	177	●



MU medium machining of steel



Prod. Gr. 133

ORION® SNMG rough machining negative
ISO P

Carbide type			OHC7615	OHC7625	OHC7635
Machining conditions for indexable insert			Good	Medium	Unfavourable
Vc in steel ●			175-400 m/min	240-400 m/min	125-295 m/min
Vc in stainless steel ●			160-350 m/min	140-240 m/min	75-175 m/min
Vc in cast iron ●			160-350 m/min	225-380 m/min	
Vc in special alloys ●				45-105 m/min	
Vc in hardened steel ●			50-70 m/min		
ISO name	min./max. ap	f min./max.	17867... Ident. No.	17867... Ident. No.	17867... Ident. No.
SNMG 120408 RU	1-7 mm	0.2-0.5 mm/U	050 ●	051 ●	052 ●
SNMG 120412 RU	1.5-7 mm	0.25-0.7 mm/U	053 ●	054 ●	055 ●
SNMG 120416 RU	2-7 mm	0.3-0.75 mm/U	056 ●	057 ●	058 ●



RU

RU rough machining of steel

Prod. Gr. 133

ORION® SNMM rough machining negative
ISO P

Carbide type			OHC7615	OHC7625
Machining conditions for indexable insert			Good	Medium
Vc in steel ●			155-320 m/min	145-315 m/min
Vc in stainless steel ●				120-180 m/min
Vc in cast iron ●			145-300 m/min	135-295 m/min
Vc in special alloys ●				25-90 m/min
ISO name	min./max. ap	f min./max.	17870... Ident. No.	17870... Ident. No.
SNMM 120408 RP1	1.5-6 mm	0.3-0.68 mm/U	720 ●	721 ●
SNMM 120412 RP1	2-6 mm	0.32-0.7 mm/U	722 ●	723 ●
SNMM 120416 RP1	2-8 mm	0.35-0.8 mm/U	724 ●	725 ●
SNMM 150608 RP1	2-8 mm	0.35-0.6 mm/U	726 ●	727 ●
SNMM 150612 RP1	2-9 mm	0.35-1 mm/U	728 ●	729 ●
SNMM 150616 RP1	2-10 mm	0.4-1 mm/U	730 ●	731 ●
SNMM 190612 RP1	3-10 mm	0.35-1 mm/U	732 ●	733 ●
SNMM 190616 RP1	2-10 mm	0.38-1.2 mm/U	734 ●	735 ●
SNMM 190624 RP1	3.5-12 mm	0.45-1.2 mm/U	736 ●	737 ●
SNMM 250716 RP1	4-16 mm	0.45-1.36 mm/U	738 ●	739 ●
SNMM 250724 RP1	4-16 mm	0.45-1.7 mm/U	740 ●	741 ●
SNMM 250924 RP1	4-16 mm	0.45-1.7 mm/U	-	742 ●



RP1

RP1 rough machining of single-sided panel, steel

Prod. Gr. 133

ORION® SNMM rough machining negative
ISO P

Carbide type			OHC7625
Machining conditions for indexable insert			Medium
Vc in steel ●			145-315 m/min
Vc in stainless steel ●			120-180 m/min
Vc in cast iron ●			135-295 m/min
Vc in special alloys ●			25-90 m/min
ISO name	min./max. ap	f min./max.	17870... Ident. No.
SNMM 120408-RM1	0.8-7 mm	0.3-0.55 mm/U	700 ●
SNMM 120412-RM1	1.2-7.5 mm	0.32-0.7 mm/U	701 ●
SNMM 150612-RM1	1.2-9 mm	0.3-0.7 mm/U	702 ●
SNMM 150616-RM1	1.6-9 mm	0.35-0.9 mm/U	703 ●
SNMM 190612-RM1	1.5-12 mm	0.32-0.7 mm/U	704 ●
SNMM 190616-RM1	1.6-12 mm	0.35-0.9 mm/U	705 ●
SNMM 190624-RM1	2.5-12 mm	0.4-1.2 mm/U	706 ●
SNMM 250724-RM1	3-16 mm	0.5-1.4 mm/U	707 ●
SNMM 250924-RM1	3-16 mm	0.5-1.6 mm/U	708 ●



RM1

RM1 rough machining of single-sided panel, stainless steel

Prod. Gr. 133



ORION® SNMG medium machining negative

ISO M

Carbide type			OHC7515	OHC7530	OHC7535	
Machining conditions for indexable insert			Good	Medium	Unfavourable	
Vc in steel ●			180-320 m/min	160-255 m/min	150-260 m/min	
Vc in stainless steel ●			105-190 m/min	95-150 m/min	90-150 m/min	
Vc in special alloys ●			35-95 m/min	30-75 m/min	30-75 m/min	
ISO name	min./max. ap	f min./max.	17867... Ident. No.		17867... Ident. No.	
SNMG 120408-MU	0.8-3 mm	0.15-0.45 mm/U	178	●	181	●
SNMG 120412-MU	1.2-3 mm	0.15-0.45 mm/U	-	-	182	●
					198	●

Prod. Gr. 133



MU medium machining of stainless steel

ORION® SNMG medium machining negative

ISO M

Carbide type			OHC7520
Machining conditions for indexable insert			Medium
Vc in stainless steel ●			150-220 m/min
Vc in special alloys ●			30-90 m/min
ISO name	min./max. ap	f min./max.	17867... Ident. No.
SNMG 120408-MM3	0.5-6 mm	0.12-0.4 mm/U	560 ●

Prod. Gr. 133



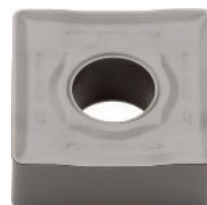
MM medium machining

ORION® SNMM rough machining negative

ISO M

Carbide type			OHC7525
Machining conditions for indexable insert			Unfavourable
Vc in steel ●			95-255 m/min
Vc in stainless steel ●			55-150 m/min
ISO name	min./max. ap	f min./max.	17870... Ident. No.
SNMM 120408-RM1	0.8-7 mm	0.3-0.55 mm/U	710 ●
SNMM 120412-RM1	1.2-7.5 mm	0.32-0.7 mm/U	711 ●
SNMM 150612-RM1	1.2-9 mm	0.3-0.7 mm/U	712 ●
SNMM 150616-RM1	1.6-9 mm	0.35-0.9 mm/U	713 ●
SNMM 190612-RM1	1.5-12 mm	0.32-0.7 mm/U	714 ●
SNMM 190616-RM1	1.6-12 mm	0.35-0.9 mm/U	715 ●
SNMM 190624-RM1	2.5-12 mm	0.4-1.2 mm/U	716 ●
SNMM 250724-RM1	3-16 mm	0.5-1.4 mm/U	717 ●
SNMM 250924-RM1	3-16 mm	0.5-1.6 mm/U	718 ●

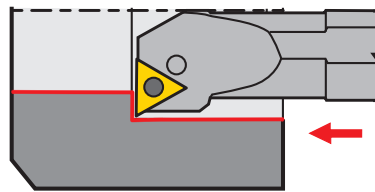
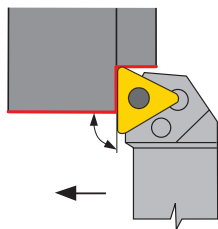
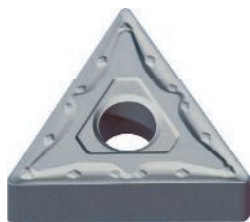
Prod. Gr. 133



RM1 rough machining of single-sided panel, stainless steel



TN.. Indexable inserts - for longitudinal turning and facing
For longitudinal turning and facing



ORION® TNMG medium machining negative
ISO P

		Carbide type		OHC7615	OHC7625	OHC7635
Machining conditions for indexable insert		Good		Good	Medium	Unfavourable
Vc in steel ●		175-315 m/min		175-315 m/min	195-320 m/min	135-240 m/min
Vc in stainless steel ●					115-190 m/min	
Vc in cast iron ●		170-295 m/min		170-295 m/min	185-300 m/min	
ISO name	min./max. ap	f min./max.	17868... Ident. No.	17868... Ident. No.	17868... Ident. No.	17868... Ident. No.
TNMG 160404-MU	0.5-3 mm	0.15-0.24 mm/U	648 ●	650 ●	653 ●	654 ●
TNMG 160408-MU	0.8-3 mm	0.15-0.45 mm/U	649 ●	652 ●	654 ●	654 ●

Prod. Gr. 133



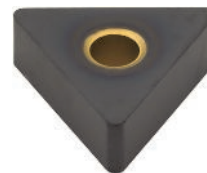
MU medium machining of steel



ORION® TNMA medium machining negative
ISO P

		Carbide type		OHC6605
Machining conditions for indexable insert		Good		Good
Vc in steel ●		280-450 m/min		280-450 m/min
Vc in cast iron ●		300-400 m/min		300-400 m/min
Vc in hardened steel ●		50-90 m/min		50-90 m/min
ISO name	min./max. ap	f min./max.	17996... Ident. No.	17996... Ident. No.
TNMA 160404	0.1-1.5 mm	0.12-0.2 mm/U	095 ●	100 ●
TNMA 160408	0.1-1.5 mm	0.15-0.2 mm/U	100 ●	100 ●

Prod. Gr. 133



OHC6605 medium machining for hard materials up to 55 HRC



ORION® TNMG medium machining negative
ISO M

			Carbide type		OHC7515		OHC7530		OHC7535	
Machining conditions for indexable insert			Good		Medium		Unfavourable			
Vc in steel ●			155-315 m/min		130-205 m/min		125-215 m/min			
Vc in stainless steel ●			90-185 m/min		75-120 m/min		75-125 m/min			
Vc in special alloys ●			30-90 m/min		25-50 m/min		25-60 m/min			
ISO name	min./max. ap	f min./max.	17868... Ident. No.		17868... Ident. No.		17868... Ident. No.			
TNMG 160404-MU	0.5-3 mm	0.1-0.24 mm/U	658	●	660	●	663	●		
TNMG 160408-MU	0.8-3 mm	0.15-0.45 mm/U	659	●	662	●	664	●		

Prod. Gr. 133



MU medium machining of stainless steel



ORION® TNMG medium machining negative
ISO M

			Carbide type		OHC6530	
Machining conditions for indexable insert			Medium			
Vc in steel ●			80-160 m/min			
Vc in stainless steel ●			70-160 m/min			
ISO name	min./max. ap	f min./max.	17868... Ident. No.			
TNMG 160404-EL	0.8-4.5 mm	0.15-0.25 mm/U	550	●		
TNMG 160408-EL	0.8-2.5 mm	0.15-0.45 mm/U	555	●		
TNMG 160404-ER	0.8-4.5 mm	0.15-0.25 mm/U	551	●		
TNMG 160408-ER	0.8-2.5 mm	0.15-0.45 mm/U	556	●		

Prod. Gr. 133



Extremely positive chip breaker



THE HIGHEST QUALITY PRODUCTS
FOR MAXIMUM EFFICIENCY.

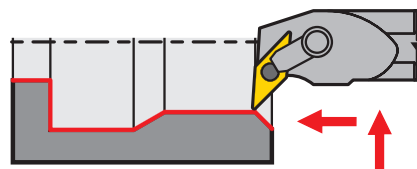
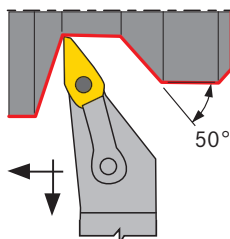
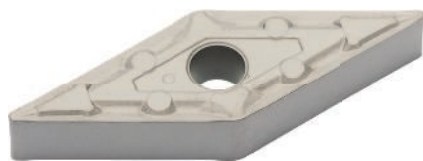
WE HAVE WHAT IT TAKES.

For a complete range of products that meet the toughest demands, visit www.iconridge.com



VN.. Indexable inserts - for longitudinal and copy turning

For longitudinal and copy turning



ORION® VNMG medium machining negative

ISO P

		Carbide type	OHC7615	OHC7625
Machining conditions for indexable insert			Good	Medium
Vc in steel ●			175-260 m/min	165-250 m/min
Vc in stainless steel ●				95-150 m/min
Vc in cast iron ●			165-245 m/min	155-235 m/min
Vc in special alloys ●				30-75 m/min
ISO name	min./max. ap	f min./max.	17866... Ident. No.	17866... Ident. No.
VNMG 160404 MU	0.5-3 mm	0.15-0.2 mm/U	070 ●	071 ●
VNMG 160408 MU	0.8-3 mm	0.15-0.35 mm/U	072 ●	073 ●
VNMG 160412 MU	1.2-3 mm	0.15-0.45 mm/U	074 ●	075 ●



MU - medium machining of steel

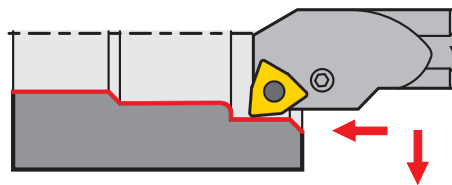
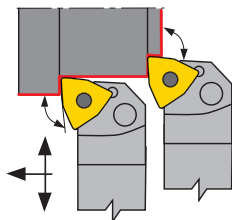


Prod. Gr. 133



WN.. Indexable inserts - for longitudinal turning and facing

For longitudinal turning and facing

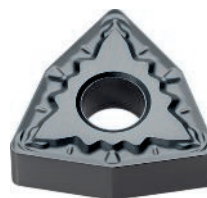


ORION® WNMG medium machining negative

ISO P

			Carbide type		OHC7615		OHC7625		OHC7635	
Machining conditions for indexable insert			Good		Medium		Unfavourable			
Vc in steel ●			205-370 m/min		190-335 m/min		155-280 m/min			
Vc in stainless steel ●					110-225 m/min		90-165 m/min			
Vc in cast iron ●			190-350 m/min		180-360 m/min					
ISO name	min./max. ap	f min./max.	17869... Ident. No.	●	17869... Ident. No.	●	17869... Ident. No.	●		
WNMG 060404-MU	0.5-3 mm	0.15-0.3 mm/U	141	●	152	●	160	●		
WNMG 060408-MU	0.8-3 mm	0.15-0.35 mm/U	142	●	153	●	161	●		
WNMG 080404-MU	0.5-3 mm	0.15-0.3 mm/U	143	●	154	●	162	●		
WNMG 080408-MU	0.8-3 mm	0.15-0.45 mm/U	144	●	155	●	163	●		

Prod. Gr. 133



MU medium machining of steel

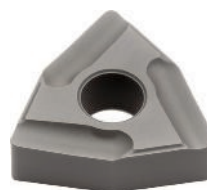


ORION® WNMG medium machining negative

ISO P

			Carbide type		OHC7625	
Machining conditions for indexable insert			Medium			
Vc in steel ●			245-370 m/min			
Vc in stainless steel ●			145-220 m/min			
Vc in cast iron ●			230-350 m/min			
Vc in special alloys ●			45-110 m/min			
ISO name	min./max. ap	f min./max.	17869... Ident. No.	●		
WNMG 60404 MW-ER	0.8-4.2 mm	0.2-0.3 mm/U	096	●		
WNMG 80404 MW-ER	0.8-5 mm	0.2-0.3 mm/U	098	●		
WNMG 80408 MW-ER	0.8-5 mm	0.2-0.5 mm/U	100	●		

Prod. Gr. 133



OHC7625 highly positive chip breaker, steel



ORION® WNMG medium machining negative

ISO P

			Carbide type		OHC7625	
Machining conditions for indexable insert			Medium			
Vc in steel ●			245-370 m/min			
Vc in stainless steel ●			145-220 m/min			
Vc in cast iron ●			230-350 m/min			
Vc in special alloys ●			45-110 m/min			
ISO name	min./max. ap	f min./max.	17869... Ident. No.	●		
WNMG 60404 MW-EL	0.8-4.2 mm	0.2-0.3 mm/U	097	●		
WNMG 80404 MW-EL	0.8-5 mm	0.2-0.3 mm/U	099	●		
WNMG 80408 MW-EL	0.8-5 mm	0.2-0.5 mm/U	101	●		

Prod. Gr. 133



OHC7625 highly positive chip breaker, steel

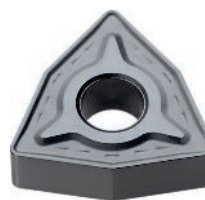


ORION® WNMG rough machining negative

ISO P

Carbide type			OHC7615	OHC7625	OHC7635
Machining conditions for indexable insert			Good	Medium	Unfavourable
Vc in steel ●			205-370 m/min	190-335 m/min	155-280 m/min
Vc in stainless steel ●			190-350 m/min	180-360 m/min	90-165 m/min
Vc in cast iron ●			190-350 m/min	180-360 m/min	
ISO name	min./max. ap	f min./max.	17869... Ident. No.	17869... Ident. No.	17869... Ident. No.
WNMG 080408-RU	1-5 mm	0.2-0.5 mm/U	145 ●	158 ●	164 ●
WNMG 080412-RU	1.2-5 mm	0.15-0.55 mm/U	146 ●	159 ●	166 ●

Prod. Gr. 133



RU rough machining of steel

ORION® WNMG medium machining negative

ISO M

Carbide type			OHC7515	OHC7530
Machining conditions for indexable insert			Good	Medium
Vc in steel ●			170-375 m/min	130-245 m/min
Vc in stainless steel ●			100-225 m/min	75-145 m/min
Vc in special alloys ●			30-110 m/min	25-70 m/min
ISO name	min./max. ap	f min./max.	17869... Ident. No.	17869... Ident. No.
WNMG 060404-MU	0.5-3 mm	0.1-0.3 mm/U	129 ●	165 ●
WNMG 080408-MU	0.8-3 mm	0.15-0.45 mm/U	131 ●	168 ●

Prod. Gr. 133



MU medium machining of stainless steel

ORION® WNMG medium machining negative

ISO M

Carbide type			OHC7525
Machining conditions for indexable insert			Medium
Vc in steel ●			165-255 m/min
Vc in non-ferrous metals ●			245-890 m/min
Vc in stainless steel ●			95-150 m/min
Vc in cast iron ●			155-240 m/min
Vc in special alloys ●			30-75 m/min
ISO name	min./max. ap	f min./max.	17869... Ident. No.
WNMG 60404 MW-ER	0.8-4.2 mm	0.2-0.3 mm/U	176 ●
WNMG 80404 MW-ER	0.8-5 mm	0.2-0.3 mm/U	178 ●
WNMG 80408 MW-ER	0.8-5 mm	0.2-0.5 mm/U	180 ●

Prod. Gr. 133



OHC7525 highly positive chip breaker, stainless steel

ORION® WNMG medium machining negative

ISO M

Carbide type			OHC7525
Machining conditions for indexable insert			Medium
Vc in steel ●			165-255 m/min
Vc in non-ferrous metals ●			245-890 m/min
Vc in stainless steel ●			95-150 m/min
Vc in cast iron ●			155-240 m/min
Vc in special alloys ●			30-75 m/min
ISO name	min./max. ap	f min./max.	17869... Ident. No.
WNMG 60404 MW-EL	0.8-4.2 mm	0.2-0.3 mm/U	177 ●
WNMG 80404 MW-EL	0.8-5 mm	0.2-0.3 mm/U	179 ●
WNMG 80408 MW-EL	0.8-5 mm	0.2-0.5 mm/U	181 ●

Prod. Gr. 133



OHC7525 highly positive chip breaker, stainless steel

ORION® WNMG rough machining negative
ISO M

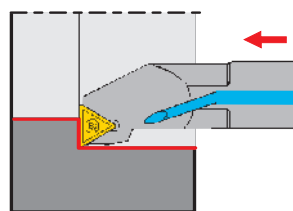
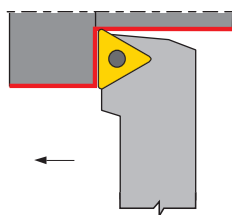
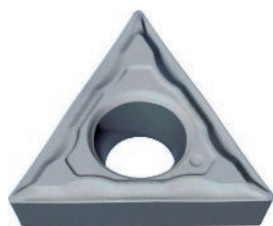
			Carbide type		OHC7515	OHC7530
Machining conditions for indexable insert			Good		Good	Medium
Vc in steel ●			170-375 m/min		130-245 m/min	
Vc in stainless steel ●			100-225 m/min		75-145 m/min	
Vc in special alloys ●			30-110 m/min		25-70 m/min	
ISO name	min./max. ap	f min./max.	17869... Ident. No.		17869... Ident. No.	
WNMG 080408-RU	1-5 mm	0.2-0.55 mm/U	132	●	169	●
WNMG 080412-RU	1.2-5 mm	0.25-0.7 mm/U	133	●	-	-

Prod. Gr. 133



RU rough machining of stainless steel

i **TC.. Indexable inserts - for longitudinal and copy turning**
For longitudinal and copy turning

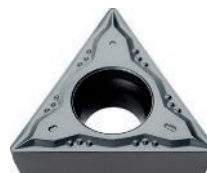


TCMT smoothing positive

ORION® TCMT medium machining positive
ISO P

			Carbide type		OHC7625	OHC7615
Machining conditions for indexable insert			Medium		Medium	Good
Vc in steel ●			190-305 m/min		160-290 m/min	
Vc in stainless steel ●			110-180 m/min			
Vc in cast iron ●			180-285 m/min		160-275 m/min	
ISO name	min./max. ap	f min./max.	17868... Ident. No.		17868... Ident. No.	
TCMT 110202-MU	0.2-2 mm	0.1-0.12 mm/U	541	●	-	-
TCMT 110204-MU	0.4-2 mm	0.1-0.24 mm/U	542	●	512	●
TCMT 16T304-MU	0.4-3 mm	0.15-0.24 mm/U	543	●	513	●
TCMT 16T308-MU	0.8-3 mm	0.15-0.35 mm/U	544	●	514	●

Prod. Gr. 133



MU medium machining of steel

ORION® TCMW medium machining positive
ISO P

			Carbide type		OHC6605
Machining conditions for indexable insert			Good		Good
Vc in steel ●			280-450 m/min		
Vc in cast iron ●			300-400 m/min		
Vc in hardened steel ●			50-90 m/min		
ISO name	min./max. ap	f min./max.	17996... Ident. No.		
TCMW 110204	0.1-1.5 mm	0.05-0.2 mm/U	080	●	
TCMW 16T304	0.1-1.5 mm	0.05-0.2 mm/U	085	●	
TCMW 16T308	0.1-1.5 mm	0.12-0.2 mm/U	090	●	

Prod. Gr. 133



OHC6605 medium machining for hard materials up to 55 HRC

ORION® TCMT medium machining positive

ISO M

Carbide type			OHC7515	OHC7530	OHC7535
Machining conditions for indexable insert			Good	Medium	Unfavourable
Vc in steel ●			145-255 m/min	125-195 m/min	130-185 m/min
Vc in stainless steel ●			85-150 m/min	75-115 m/min	75-110 m/min
Vc in special alloys ●			25-75 m/min	25-60 m/min	25-55 m/min
ISO name	min./max. ap	f min./max.	17868... Ident. No.	17868... Ident. No.	17868... Ident. No.
TCMT 110204-MU	0.4-2 mm	0.08-0.24 mm/U	552 ●	557 ●	562 ●
TCMT 16T308-MU	0.8-3 mm	0.15-0.35 mm/U	553 ●	560 ●	563 ●

Prod. Gr. 133



MU medium machining of stainless steel



ORION® TCMT medium machining positive

ISO M

Carbide type			OHC7525
Machining conditions for indexable insert			Medium
Vc in steel ●			145-225 m/min
Vc in non-ferrous metals ●			215-785 m/min
Vc in stainless steel ●			85-135 m/min
Vc in cast iron ●			135-210 m/min
Vc in special alloys ●			25-65 m/min
ISO name	min./max. ap	f min./max.	17868... Ident. No.
TCGT 110202 MW-ER	0.4-1.6 mm	0.08-0.12 mm/U	580 ●
TCGT 110204 MW-ER	0.4-1.6 mm	0.08-0.24 mm/U	581 ●

Prod. Gr. 133



OHC7525 highly positive chip breaker, stainless steel



ORION® TCMT medium machining positive

ISO M

Carbide type			OHC7525
Machining conditions for indexable insert			Medium
Vc in steel ●			145-225 m/min
Vc in non-ferrous metals ●			215-785 m/min
Vc in stainless steel ●			85-135 m/min
Vc in cast iron ●			135-210 m/min
Vc in special alloys ●			25-65 m/min
ISO name	min./max. ap	f min./max.	17868... Ident. No.
TCGT 110202 MW-EL	0.4-1.6 mm	0.08-0.12 mm/U	582 ●
TCGT 110204 MW-EL	0.4-1.6 mm	0.08-0.24 mm/U	583 ●

Prod. Gr. 133



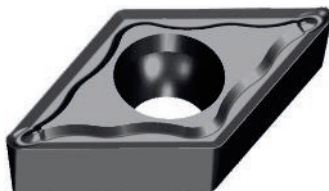
OHC7525 highly positive chip breaker, stainless steel



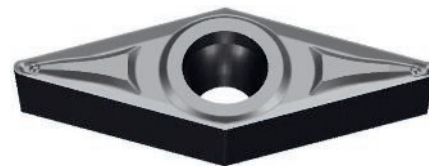
ORION® CERMET indexable inserts
 Finishing with low cutting depth in steel, stainless steel, cast steel



Ident. No. 016



Ident. No. 018-020



Ident. No. 022-024

ISO name	min./max. ap	Machining conditions for indexable insert f min./max.	Carbide type	OHC6601
			17995... Ident. No.	Good
CCGT09T304-SF	0.5-1.5 mm	0.05-0.2 mm/U	016	●
DCGT11T302-SF	0.5-1.5 mm	0.05-0.2 mm/U	018	●
DCGT 11T304-SF	0.5-1.5 mm	0.05-0.2 mm/U	020	●
VCGT110302-SF	0.5-1.5 mm	0.05-0.2 mm/U	022	●
VCGT110304-SF	0.5-1.5 mm	0.05-0.2 mm/U	024	●

Prod. Gr. 133



Hard machining process with CBN

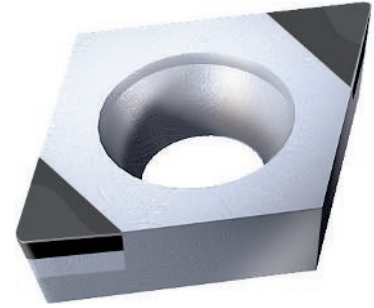
Cutting hardened steel is referred to as hard cutting. By introducing energy in the form of cutting speed v_c , feed f , depth of cut a_p and different cutting edges = chamfer, self-induced hot cutting is produced. This requires a defined high temperature of approx. 550 to 750° C in the shear zone. Cooling is not required for this process.

To generate and maintain the ideal cutting temperature in the shear zone, the following must be observed:

- Selection of appropriate cutting material for different materials,
- Determination of appropriate bevel geometry A-H
- Identification of cutting speed in event charts (hardness diagram with increasing temperature)

The following points must be noted:

- Exact specification of the type of steel and its hardness in HRC.
- Required surface quality R_a in μm as well as cutting depth.
- Machining conditions smooth, slightly interrupted or severely interrupted cut



Selection of the cutting material types when machining with PCBN

We distinguish between materials based on the concentration of CBN content. In the case of a high CBN content, materials such as cast iron, special alloys and sintered steels can be machined. For hard machining, the CBN content must be reduced.

A distinction is made between the following cutting materials:

Coating	CBN content									
	100	90	80	70	60	50	40	30	20	10
uncoated	ABC-10									
uncoated	ABC-25									
uncoated	ABC-40									
coated	ABC-10B									
coated	ABC-25B									
coated	ABC-40B									

CBN grades, uncoated:

ABC-10

- Uncoated CBN type with very high CBN content (95%) for application in grey cast iron, special alloys, sintered steels
- Fine grain 1-1.5 μm
- Application both in favourable conditions (smooth cut) and unfavourable conditions (non-continuous cut) $a_p = 0.1-0.7$ mm

ABC-25

- Uncoated CBN type with low CBN content (65%) in hard cutting, dry + wet from HRC 52 - 65
- Fine grain (3 μm)
- Application in favourable conditions (smooth cut) and very lightly interrupted cutting $a_p = 0.05 - 0.4$ mm

ABC-40

- Uncoated CBN type with low CBN content (65%)
- Hard machining, dry + wet from HRC 54 - 65
- Application in unfavourable conditions for lightly and heavily interrupted cutting $a_p = 0.05 - 0.4$ mm

CBN grades, coated:

ABC-10B

- CBN cutting material coated with 95% CBN content for application in grey cast iron (GG20-GG40) and special alloys such as Inconel 718, Nicomic, Hastelloy, Waspaloy
- Fine grain (1-1.5 μm)
- Application both in favourable conditions (smooth cut) and unfavourable conditions (non-continuous cut) $a_p = 0.1-0.7$ mm

ABC-25B

- CBN cutting material coated with 65% CBN content for application in hard machining 48-62 HRC (wet-dry)
- Fine grain (1 - 2 μm)
- Application in favourable conditions (smooth cut) $a_p = 0.02 - 0.4$ mm

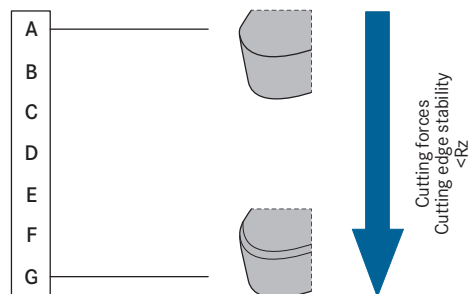
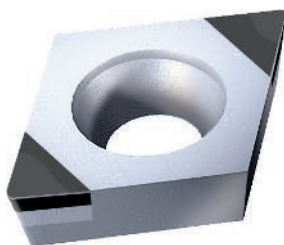
ABC-40B

- CBN cutting material coated with 55% CBN content for application in hard machining 48-62 HRC (wet-dry)
- Superfine grain (0.75 μm)
- Application in unfavourable conditions for lightly and heavily interrupted cutting $a_p = 0.05-0.4$ mm



Cutting edge design for CBN cutting materials

The ATORN cutting edge range includes various distinct cutting edge designs. The standard range includes different chamfers on the cutting edge. These include sharp-edge (A) to high chamfer versions (G), depending on the application. The use of high chamfers on the cutting edge can achieve very good surfaces, but the forces are increased. Sharp-edge variants are the appropriate choice for long projections with unstable conditions.



Machining parameters for CBN cutting materials - ABC-10 Super alloys: Inconel 718, Nimonic, Hastelloy, Waspaloy

V _c : m/min		Cutting edge design (negative chamfer)								
		A	B	C	D	E	F	G	H	
Cutting speed ↑ ↑ ↑	700	V _c	V _c	V _c	V _c	V _c	V _c	V _c	V _c	
	600									
	500									
	400									
	300									
	200									
	100									
Feed		f: 0.02-0.25	f: 0.04-0.25	f: 0.05-0.25	f: 0.05-0.4	f: 0.06-0.5	f: 0.08-0.35	f: 0.1-0.35	f: 0.12-0.35	Feed
Cutting depth ABC-10		a _p : 0.02-0.4	a _p : 0.03-0.4	a _p : 0.06-0.4	a _p : 0.06-0.4	a _p : 0.08-0.5	a _p : 0.08-0.4	a _p : 0.1-0.4	a _p : 0.12-0.4	Cutting depth ABC-10
Cutting conditions		Smooth to medium interrupted cut								Cutting conditions



Selecting the corner radius

Selecting the appropriate corner radius is an important component for machining: In principle, small corner radii of 2, 4 mm are highly suitable for ensuring chip control. Larger radii of 8, 12 mm have a positive impact on the surface quality and chip formation (thin chips). Scour wear is thereby minimized. Generally, a large corner radius offers a higher cutting edge stability and as a result, a longer service life.



Machining parameters for CBN cutting materials - ABC-10 Grey cast iron GG20 - GG25 - GG30 - GG40

V _c : m/min		Cutting edge design (negative chamfer)								
		A	B	C	D	E	F	G	H	
Cutting speed ↑ ↑ ↑	1750	V _c	V _c	V _c	V _c	V _c	V _c	V _c	V _c	
	1500									
	1250									
	1000									
	750									
	500									
	300									
Feed		f: 0.02-0.25	f: 0.04-0.25	f: 0.05-0.25	f: 0.05-0.4	f: 0.06-0.5	f: 0.08-0.35	f: 0.1-0.35	f: 0.12-0.35	Feed
Cutting depth ABC-10		a _p : 0.02-0.25	a _p : 0.03-0.3	a _p : 0.06-0.4	a _p : 0.06-0.4	a _p : 0.08-0.5	a _p : 0.08-0.4	a _p : 0.1-0.4	a _p : 0.12-0.4	Cutting depth ABC-10
Cutting conditions		Smooth to strongly interrupted cut								Cutting conditions



Machining parameters for CBN cutting materials - ABC-25 / ABC-25B

V _c : m/min	Cutting edge design (negative chamfer)								R _s (μm)			
	A	B	C	D	E	F	G	H	Surface quality ↑ ↑ ↑ ↑			
Cutting speed ↑ ↑ ↑ ↑	350										0.1 μm	
	300										0.2 μm	
	250	V _c									0.4 μm	
	200	V _c	V _c								0.8 μm	
	150	V _c	V _c	V _c	V _c	V _c	V _c	V _c			1.6 μm	
	100	R _a									3.2 μm	
	50	R _a									6.4 μm	
Feed	f: 0.02-0.15	f: 0.03-0.15	f: 0.04-0.20	f: 0.05-0.25	f: 0.06-0.25	f: 0.06-0.25	f: 0.06-0.20	f: 0.06-0.20			Feed	
Cutting depth ABC-25B	a _p : 0.04-0.25	a _p : 0.04-0.3	a _p : 0.06-0.4	a _p : 0.06-0.4	a _p : 0.08-0.4	a _p : 0.08-0.4	a _p : 0.1-0.4	a _p : 0.12-0.4			Cutting depth ABC-25B	
Cutting depth ABC-25	a _p : 0.04-0.25			a _p : 0.06-0.4					Cutting depth ABC-25			
Cutting conditions	Smooth cut								Cutting conditions			

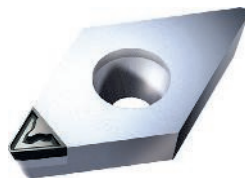


Machining parameters for CBN cutting materials - ABC-40 / ABC-40B

V _c : m/min	Cutting edge design (negative chamfer)								R _s (μm)			
	A	B	C	D	E	F	G	H	Surface quality ↑ ↑ ↑ ↑			
Cutting speed ↑ ↑ ↑ ↑	350										0.1 μm	
	300										0.2 μm	
	250	V _c									0.4 μm	
	200	V _c	V _c								0.8 μm	
	150	V _c	V _c	V _c	V _c	V _c	V _c	V _c			1.6 μm	
	100	R _a									3.2 μm	
	50	R _a									6.4 μm	
Feed	f: 0.02-0.12	f: 0.03-0.15	f: 0.04-0.20	f: 0.06-0.20	f: 0.06-0.25	f: 0.06-0.25	f: 0.08-0.20	f: 0.08-0.20			Feed	
Cutting depth ABC-40B	a _p : 0.05-0.25	a _p : 0.06-0.3	a _p : 0.08-0.3	a _p : 0.08-0.3	a _p : 0.10-0.4	a _p : 0.10-0.4	a _p : 0.15-0.4	a _p : 0.20-0.4			Cutting depth ABC-40B	
Cutting depth ABC-40	a _p : 0.04-0.25				a _p : 0.07-0.4				Cutting depth ABC-40			
Cutting conditions	Very low		Light		Medium		Strong		Cutting conditions			
Cutting conditions	Interrupted cut								Cutting conditions			



Ultra-hard diamond cutting materials and their areas of application



with diamond as cutting material, the material groups of non-ferrous metals, plastics, graphite are machined primarily, as illustrated in the table, very high cutting speeds are possible with low wear.

material	cutting speed Vc (m/min)
aluminium and aluminium alloys 0 - 20% SiC	1250 - 5000
plastics	500 - 3000
non-ferrous metals, bronze, brass, copper	750 - 3200
GFK (80%)	300 - 800
graphite CFK (80%)	250 - 800
MMC	750 - 1300
GGC	300 - 600



Selection of the cutting material types when machining with PCD

Our standard range includes two cutting materials with the following properties:

ADC

- Polycrystalline diamond as a composite cutting material with a cemented carbide backing with high cutting sharpness and low cutting pressure in a narrow tolerance field
- Low wear resistance with high durability
- Fine grain
- Fine finishing and smoothing of all non-ferrous metals with low proportion of abrasive filler materials

ADC-S

- Polycrystalline diamond as a composite cutting material with a cemented carbide backing (coarse grain)
- With favourable cutting sharpness and low cutting pressure with narrow tolerances
- Low wear resistance with high durability
- Fine finishing and smoothing of all non-ferrous metals with low proportion of abrasive filler materials

A variety of diamond cutting materials are also available outside of our standard ranges:

MDC DM

Solid mono-crystalline diamond without structure. Absolute cutting edge sharpness and cutting edges without notches, thus virtually no cutting pressure (burr-free) and compliance with narrowest of tolerances ± 0.001 mm. Absolute wear resistance and highest thermal conductivity (HSC and HPC), low toughness. Super finishing of all non-ferrous metals and non-ferrous materials without abrasive fillers (HSC high-tech).

TFC PD

Solid poly-crystalline CVD diamond without binding agent or cemented carbide backing. Perfect cutting edge sharpness and cutting edges free of notches. No cutting pressure and compliance with the narrowest of tolerances. Maximum wear resistance and very high thermal conductivity (HSC and HPC), higher toughness. Super finishing up to semi-finish of all non-ferrous metals and non-ferrous composite materials with high proportions of abrasive fillers. Maximum service life with GFRP (80% glass) and CFRP.

PDC-CU-S DP composite

Solid poly-crystalline diamond cutting material (composite) without cemented carbide backing, coarse grain, favourable cutting edge sharpness and low cutting pressure for narrow tolerances, highly suitable for milling tools with high cutting depths. Very high wear resistance with increased toughness due to very high diamond volume. Fine finishing, finishing and milling of all non-ferrous metals and non-ferrous materials with very high proportions of abrasive fillers. Maximum material removal rate, CFRP and GFRP



Chip breaker and cutting edge designs with diamond cutting materials

A variety of diamond cutting materials are also available outside of our standard ranges:

Neutral

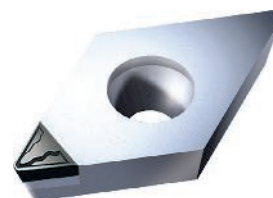
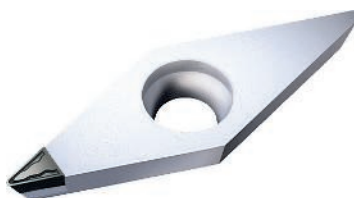
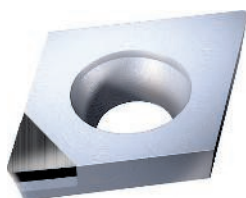
- Medium cutting pressure for solid or robust workpieces in the narrowest tolerance field with excellent surface quality
- Long continuous chips produced and no chip breaking

X1

- Virtually no cutting pressure for thin-walled or robust workpieces in narrow tolerance field with medium surface quality
- Favourable chip breaking owing to chip breaker geometry

X2

- Increased cutting pressure for solid or robust workpieces in narrowest tolerance field with good surface quality
- Favourable chip breaking owing to chip breaker geometry

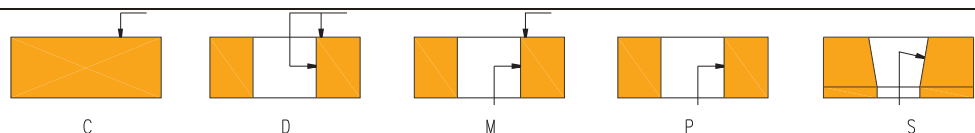
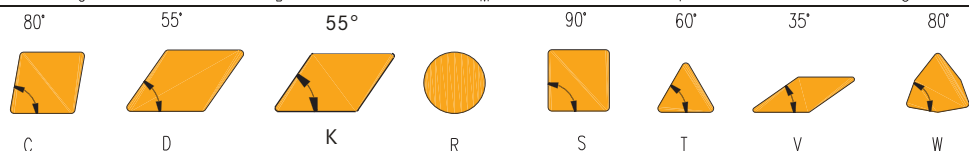
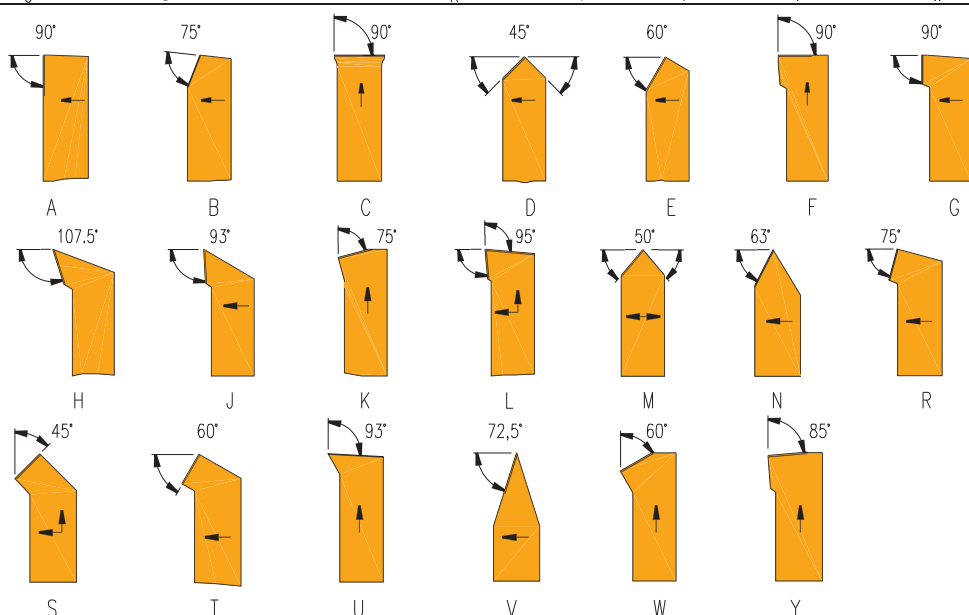
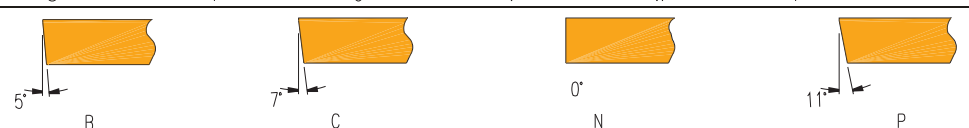
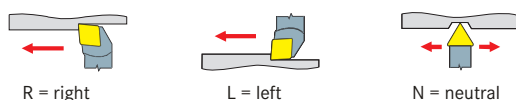


Cutting radius (mm)	X1				X2			
	ap (mm)		f (mm/U)		ap (mm)		f (mm/U)	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
0,1	0,05	0,30	0,02	0,05				
0,2	0,06	0,40	0,03	0,08	0,50	0,80	0,08	0,12
0,4	0,10	0,80	0,04	0,15	0,60	1,50	0,08	0,20
0,8	0,15	1,00	0,08	0,20	0,70	1,50	0,15	0,30
1,2	0,30	1,50	0,12	0,25	0,80	2,00	0,20	0,40


clamp holder for turning for outside machining
 clamp system, dimensions and tolerances

Designations

Clamping holder for turning according to DIN 4983

Clamping system ①

Insert shape ②

Holder shape ③

Clearance angle indexable insert ④

Cut direction ⑤

Cut direction ⑥


As basic number, the height of the cutter edge h in mm is indicated.
 For clamping holders, the height of the cutter edge h equals the shank height.

Shank width ⑦


Clamping holder: Indication of the shank width b in mm.

Holder length ⑧

	A	B	C	D	E	F	G	H	J	K	L	M	N
mm	32	40	50	60	70	80	90	100	110	125	140	150	160
	P	Q	R	S	T	U	V	W	X	Y	-		
mm	170	180	200	250	300	350	400	450		500			

Cutter length ⑨

Indication of the cutter length in mm without decimal point, in case of one-digit numerals with leading 0 (e. g. 08).
 In case of round indexable inserts, the diameter is always indicated.

Additional indications

These indications do not form part of the standard and are facultative, e. g. "-U" stands: with shim.

Example

①	②	③	④	⑤	⑥	⑦	⑧	⑨
S	C	L	C	R	16	16	H	09



high-performance clamp holder range with internal cooling



the newly developed ATORN high-performance clamp holders ensure an improvement in service life of up to 30 % in series production.

the advantages include:

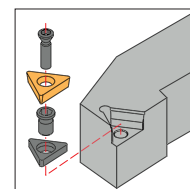
- three cooling channels directed straight at the cutting edges, ensuring optimum cooling of the cutting edge and excellent chip breaking
- individual connection options (bore hole in bottom of holder or connection with coolant hose)
- very compact holder design providing good access to the component and reliable chip removal

17830700-725	SCLC clamp holder with internal cooling, positive For facing and longitudinal turning using CC indexable inserts	
17835700-725	SDJC clamp holder with internal cooling, positive for longitudinal and copy turning with DC indexable insert	
17833700-735	SVJC clamp holder with internal cooling, positive For copy, longitudinal face lathing with VC indexable insert	
17837705-730	PCLN clamp holder with internal cooling, negative For facing and longitudinal turning using CN indexable inserts	
17838705-730	PDJN clamp holder with internal cooling, negative for copy and longitudinal lathing with DN indexable insert	
17839715-730	PWLN clamp holder with internal cooling, negative For copy and longitudinal face turning using WN indexable inserts	









clamp holder external – clamping system S for positive indexable inserts with hole

clamping positive indexable inserts which are pulled into the insert setting via a central clamping screw. modern and reliable clamping system for positive lathe machining. the advantage of this system is the high level of accessibility due to the compact design. chips can be removed reliably with this system.



17830012-092	SCLC clamp holder positive, right-hand For face and longitudinal turning with CC indexable insert	
17835001-041	SDHC clamp holder, positive, right For copy and longitudinal turning with DC indexable insert	
17831012-072	SDJC clamp holder positive, right-hand For longitudinal and copy turning with DC indexable insert	
17861	SDNC clamp holder, positive, neutral For longitudinal turning with DC indexable insert	
17924	SRDC clamp holder, positive, neutral For copy, longitudinal face lathing with RC indexable insert	
17834012-062	SSSC clamp holder positive, right-hand For copy, longitudinal face lathing with SC indexable insert	

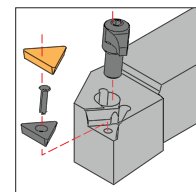



178341 10-125	STGC Clamp holder, positive, right For longitudinal turning with TC indexable insert	
17836002-041	SVHC clamp holder, positive, right For copy, longitudinal and face turning with VC indexable insert	
178361 10-115	SVJB clamp holder, positive, right For copy, longitudinal and face turning with VB indexable insert	
178330 12-062	SVJC clamp holder positive, right-hand For copying, longitudinal and face turning with VC indexable insert	
17836200-205	SVVB clamp holder, positive neutral For copy and longitudinal face turning using VB indexable inserts	
17832	SVVC clamp holder positive, neutral For copying, longitudinal and face turning with VC indexable insert	



clamp holder external - clamping system C for positive indexable inserts without hole

clamping positive indexable inserts without hole. classic clamping system for positive indexable inserts in sinter versions with and without chip breaker.

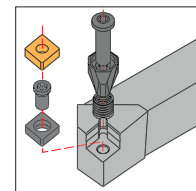






178250 10-030	CKJN clamp holder, negative, right For copy, longitudinal and face turning with KNUX indexable insert	
----------------------	-------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------



clamp holder external - clamping system D for negative indexable inserts with hole

clamping negative indexable inserts using clamping lever and adjustable clamp. the system avoids vibrations of the indexable insert at high feed rate or with severely interrupted machining.

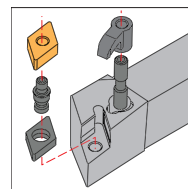


178260 10-021	DCLN clamp holder, negative, right For face and longitudinal turning with CN indexable insert	
17826 100-115	DDJN clamp holder, negative, right For copy and longitudinal turning with DN indexable insert	
17859001-002	MTEN clamp holder, negative, neutral For copy and longitudinal turning with TN indexable insert	
178590 10-015	MTJN clamp holder, negative, right For copy and longitudinal turning with TN indexable insert	



clamp holder external - clamping system M
for negative indexable inserts with hole

clamping negative indexable inserts using clamping lever and adjustable clamp. the system minimises vibration of the indexable insert. it is the first choice for negative ceramic inserts with central hole and also for cermet indexable inserts.

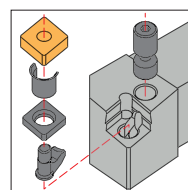


17859110-120	MVJN clamp holder, negative, right For copy and longitudinal turning with VN indexable insert	
17859200-205	MVVN clamp holder, negative, neutral For copy and longitudinal turning with VN indexable insert	
17860020-060	MWLN clamp holder, negative, right For copy, longitudinal and face turning with WN indexable insert	



clamp holder external - clamping system P
for negative indexable inserts with hole

clamping negative indexable inserts using clamping lever. clamping system P allows a wide range of applications. it is the first choice for general turning operations. the advantage of this system is the high level of accessibility due to the compact design. chips can be removed reliably with this system.



Overview of ISO clamp holders

17837110-130	PCBN clamp holder, negative, right For longitudinal turning using CN indexable insert	
17837210-220	PCKN clamp holder, negative, right For face turning using CN indexable insert	
17837001-057	PCLN clamp holder, negative, right For face and longitudinal turning with CN indexable insert	
17838001-061	PDJN clamp holder, negative, right For copy turning and longitudinal turning using DN indexable insert	
17856002-010	PDNN clamp holder, neutral For copy turning and longitudinal turning using DN indexable insert	
17857	PSNN clamp holder, neutral For chamfering and longitudinal turning using SN indexable insert	
17840020-040	PSNN clamp holder, right For copy turning and longitudinal turning using SN indexable insert	
17839011-031	PTGN clamp holder, right For copy turning and longitudinal turning using TN indexable insert	

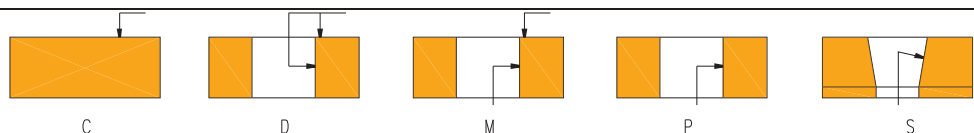


clamp holder for turning for outside machining
clamp system, dimensions and tolerances

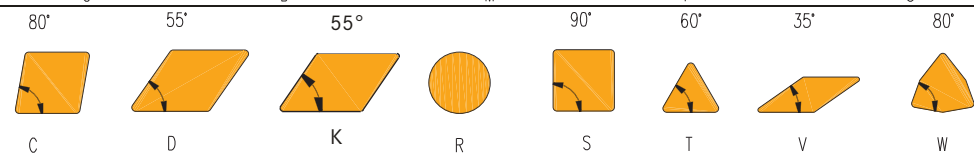
Designations

Clamping holder for turning according to DIN 4983

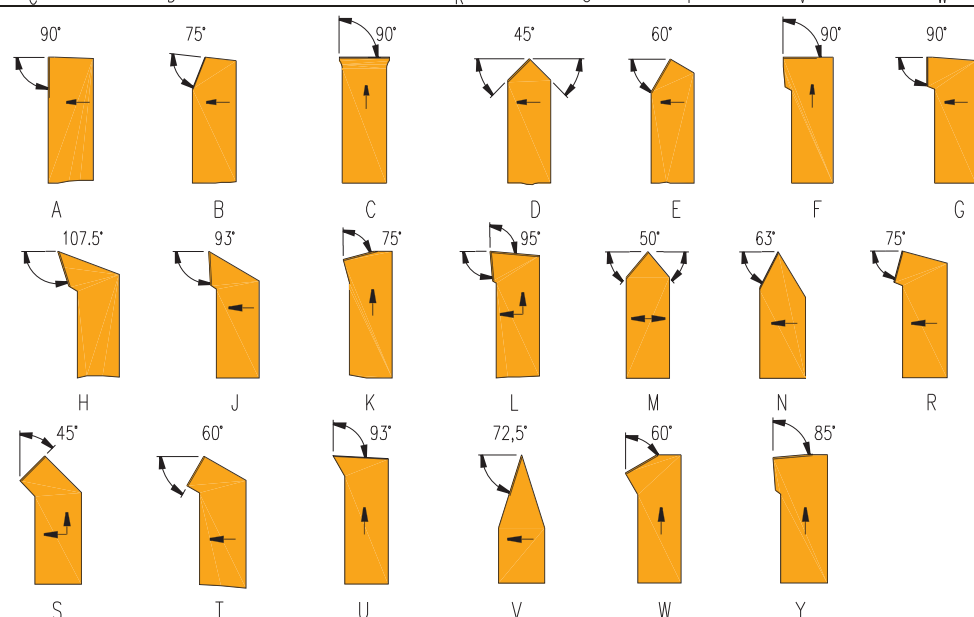
Clamping system ①



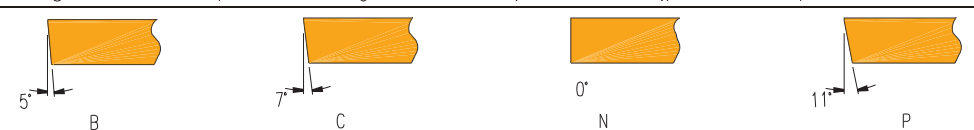
Insert shape ②



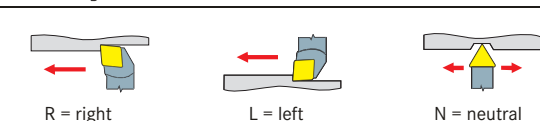
Holder shape ③



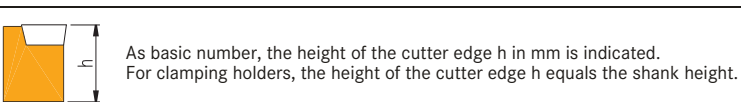
Clearance angle indexable insert ④



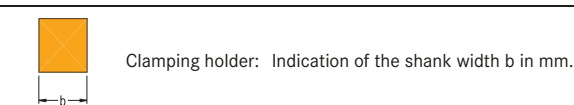
Cut direction ⑤



Cut direction ⑥



Shank width ⑦



Holder length ⑧

	A	B	C	D	E	F	G	H	J	K	L	M	N
mm	32	40	50	60	70	80	90	100	110	125	140	150	160
	P	Q	R	S	T	U	V	W	X	Y			-
mm	170	180	200	250	300	350	400	450		500			

Cutter length ⑨

Indication of the cutter length in mm without decimal point, in case of one-digit numerals with leading 0 (e. g. 08).
In case of round indexable inserts, the diameter is always indicated.

Additional indications

These indications do not form part of the standard and are facultative, e. g. "-U" stands: with shim.

Example

①	②	③	④	⑤	⑥	⑦	⑧	⑨
S	C	L	C	R	16	16	H	09

i Overview of ISO boring bars

Clamping systems, dimensions

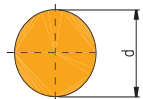
Designations

Clamping holder with cylindrical shank (boring bar) according to DIN 8024

Shank design ①

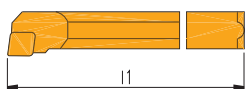
A	Steel with inner cooling lubrication feed	E	Carbide with inner cooling lubrication feed
C	Carbide	S	Steel

Shank diameter ②



Shank diameter in mm.
In case of diameters of less than 10 mm, there will be a leading 0, e. g. 08.

Holder length ③



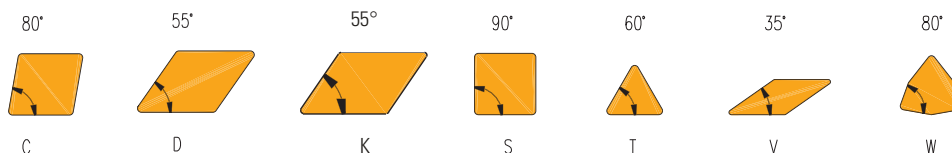
X	Special length
----------	----------------

Symbols	H	J	K	L	M	N	P	Q	R	S	T	U	V
mm	100	110	125	140	150	160	170	180	200	250	300	350	400

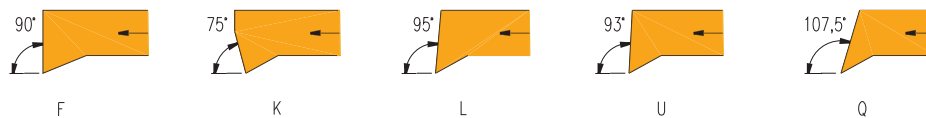
Clamping system ④



Insert shape ⑤



Holder shape ⑥



Clearance angle indexable insert ⑦



Cut direction ⑧



Cutter length ⑨

Indication of the cutter length in mm without decimal point, in case of one-digit numerals with leading 0 (e. g. 08).
In case of round indexable inserts, the diameter is always indicated.

Additional indications

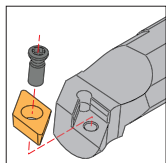
These indications do not form part of the standard and are facultative, e. g. "-U" stands: with shim.

Example

①	②	③	④	⑤	⑥	⑦	⑧	⑨
S	32	U	P	C	L	C	R	12



boring bars - clamping system S for positive indexable inserts with hole

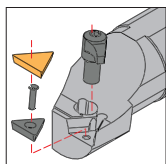


clamping positive indexable inserts which are pulled into the insert setting via a central clamping screw. modern and reliable clamping system for positive lathe machining. the advantage of this system is the high level of accessibility due to the compact design. chips can be removed reliably with this system.


17846168-174	SCLC boring bar, offset, steel, positive, right-hand For face and longitudinal turning with CC indexable insert	
17846013-083	SCLC steel boring bar, positive right for face and longitudinal turning using CC indexable insert	
17847210-214	SDUC boring bar, offset, steel, positive, right-hand For longitudinal and copy turning with DC indexable insert	
17847012-032	SDUC offset steel boring bar, positive, right for longitudinal and copy turning using DC indexable insert	
17848210-218	SDQC offset steel boring bar, positive, right for longitudinal and copy turning with DC indexable insert	
17848022-072	SDQC steel boring bar, positive right for longitudinal and copy turning using DC indexable insert	
17850021-081	STFC boring bar steel positive, right-hand For longitudinal turning with TC indexable insert	
17850300-320	SVJC boring bar steel positive, right-hand For blind hole radius turning with VC indexable insert	
17855050-055	SVUB boring bar steel, positive, right-hand For copying and longitudinal turning with VB indexable insert	
17849012-052	SVUC boring bar steel positive, right-hand For longitudinal and copy turning with VC indexable insert	



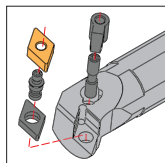
boring bar - clamping system C for positive indexable inserts without hole



clamping positive indexable inserts without hole. classic clamping system for positive indexable inserts in sinter versions with and without chip breaker.

17851010-020	CKUN steel boring bar, negative, right for longitudinal turning with KN indexable insert	
---------------------	------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------

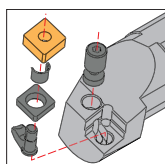
i boring bar - clamping system M
for negative indexable inserts with hole



clamping negative indexable inserts using clamping lever and adjustable clamp. the system minimises vibration of the indexable insert. it is the first choice for negative ceramic inserts with central hole and also for cermet indexable inserts.

17851110-120	MVUN steel boring bar, negative, right For copy and longitudinal turning using VN indexable insert	
---------------------	----------------------------------------------------------------------------------------------------	--

i clamp holder external - clamping system P
for negative indexable inserts with hole



clamping negative indexable inserts using clamping lever. clamping system P allows a wide range of applications. it is the first choice for general turning operations. the advantage of this system is the high level of accessibility due to the compact design. chips can be removed reliably with this system.

17852011-041	PCLN steel boring bar, negative, right for facing and longitudinal turning using CN indexable insert	
17853001-041	PDUN steel boring bar, negative, right for copy and longitudinal turning using DN indexable insert	
17854050-075	PWLN steel boring bar, negative, right for facing and longitudinal turning using WN indexable insert	
17856011-021	PSKN steel boring bar, negative, right for longitudinal turning using SN indexable insert	
17858111-151	PTFN steel boring bar, negative, right for longitudinal turning using TN indexable insert	



boring bars in steel construction



internal drilling down to a removal depth of up to 3xD



boring bars in HSS design



inner boring up to a drill depth of 4xD. HSS has good vibration-damping properties.



boring bars in cemented carbide design



inner boring up to a drill depth of 5xD. cemented carbide has very good vibration-damping properties.

i Overview of ISO boring bars

Clamping systems, dimensions

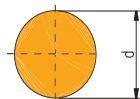
Designations

Clamping holder with cylindrical shank (boring bar) according to DIN 8024

Shank design ①

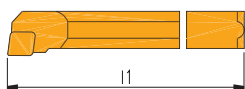
A	Steel with inner cooling lubrication feed	E	Carbide with inner cooling lubrication feed
C	Carbide	S	Steel

Shank diameter ②



Shank diameter in mm.
In case of diameters of less than 10 mm, there will be a leading 0, e. g. 08.

Holder length ③



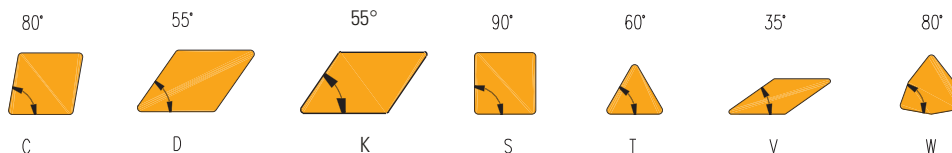
X Special length

Symbols	H	J	K	L	M	N	P	Q	R	S	T	U	V
mm	100	110	125	140	150	160	170	180	200	250	300	350	400

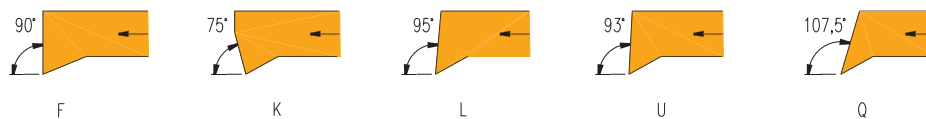
Clamping system ④



Insert shape ⑤



Holder shape ⑥



Clearance angle indexable insert ⑦



Cut direction ⑧



Cutter length ⑨

Indication of the cutter length in mm without decimal point, in case of one-digit numerals with leading 0 (e. g. 08).
In case of round indexable inserts, the diameter is always indicated.

Additional indications

These indications do not form part of the standard and are facultative, e. g. "-U" stands: with shim.

Example

①	②	③	④	⑤	⑥	⑦	⑧	⑨
S	32	U	P	C	L	C	R	12



DO YOU NEED
ELECTRIC TOOLS?

WE HAVE WHAT IT TAKES.



For a complete range of products that meet the toughest demands, visit www.iconridge.com



Miniature range with cutting insert
For demanding serial users



application:
miniature range for boring range of 1–10 mm in all material groups.

HC 5640 P30–P50; K25–K40 PVD TIN-coated cemented-carbide type with high durability for reduced cutting speeds.

minimum measurement in machining: 0.07 mm

HC5615 K10–K30; PVD multi-attachment, TiALN-coated cemented carbide type with high hardness for very high cutting speeds.

minimum measurement in machining: 0.07 mm

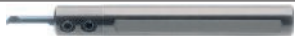










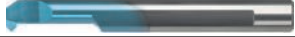
HW5615 K10–K30; uncoated cemented carbide type with high hardness for low-high cutting speeds.

minimum measurement in machining: 0.04 mm

Note:
necessary coolant pressure for reliable machining: 20 - 30 bar

- advantages:**
- extremely wide range for internal boring, copy turning, reverse boring, thread cutting, chamfering and grooving applications
 - suitable cemented-carbide quality and coating for all applications
 - outstanding service life with HC5615 in heavy-duty materials, stainless steel and titanium, and hard machining up to 65 HRC
 - special designs in all variants with short delivery times
 - adjustable cantilever length via adjustment screw in holder
 - internal cooling ensures reliable machining

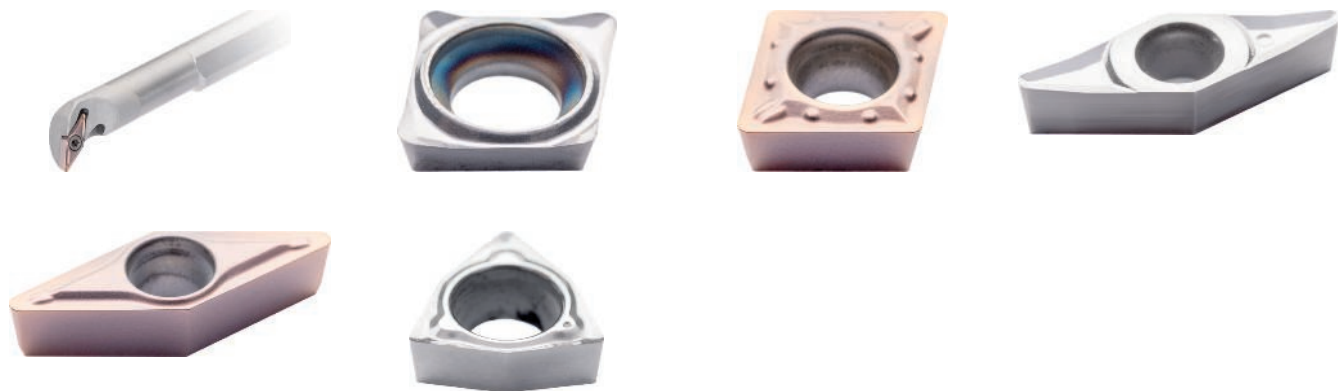
	Vc in steel min./max. ●	Vc in stainless steel min./max. ●	Vc in non-ferrous metals min./max. ●	Vc in cast iron min./max. ●	Vc in special alloys min./max. ●	Vc in hardened steel min./max. ●
HC5640	18-50	25-30	18-70	17-23		
HC5615	25-60	30-45	20-85	20-28	13-24	15-24
HW5616		20-35	20-60	17-20		

17118100-192	Miniature cutting insert holder	
17119318-458	Miniature cutting insert type AT HC5615 For longitudinal inside boring	
17120380-516	Miniature cutting insert type AP HC5615 For copying and longitudinal turning	
17121180-216	Miniature cutting insert, type AQ HC5615 For copy and longitudinal turning	
17122172-204	Miniature cutting insert type AU HC5615 For longitudinal inside boring	
17123180-200	Miniature cutting insert type AX HC5615 For reverse internal boring	
17124220-238	Miniature cutting insert type AI HC5615 For thread cutting 60°	
17124124-134	Miniature cutting insert type AI HC5615 For thread cutting 55°	
17124332-346	Miniature cutting insert type AI HC5615 For thread cutting 60°	
17124432-446	Miniature cutting insert type AI HC5615 For thread cutting 55°	
17125124-132	Miniature cutting insert, type AD HC5615 for chamfering and grooving for thread undercutting	
17127140-156	Miniature cutting insert, type AC HC5615 for chamfering and longitudinal internal boring	



Miniature boring range using indexable inserts

For ambitious serial users



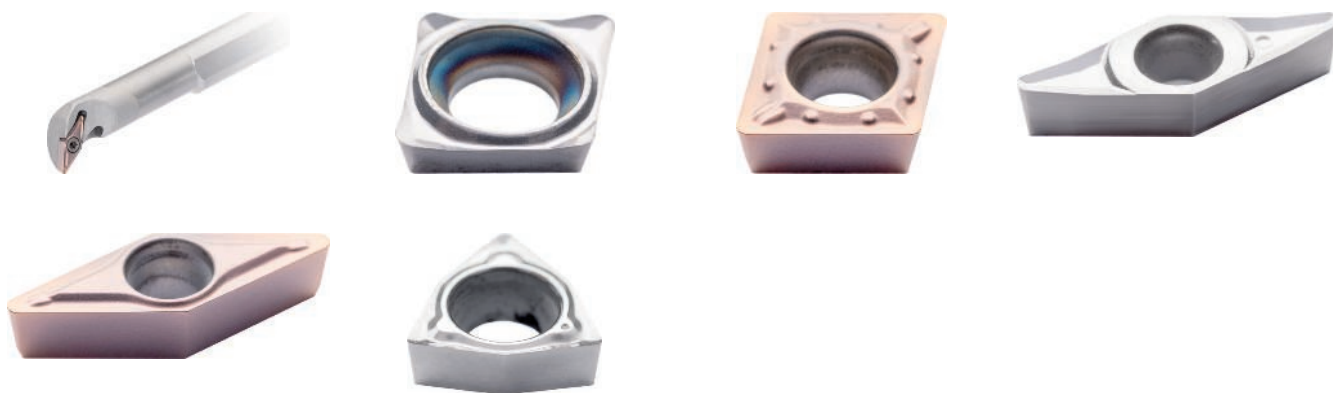
Application:

For miniature boring from a diameter of 4.8 mm with CD., CP., WC., VC.. Indexable inserts

- Wide holder range in different materials (steel, solid carbide)
- Interchangeable system for universal use
- The latest generation of innovative indexable inserts



Miniature boring range using indexable inserts
For ambitious serial users



Application:

For miniature boring from a diameter of 4.8 mm with CD.., CP.., WC.., VC.. Indexable inserts

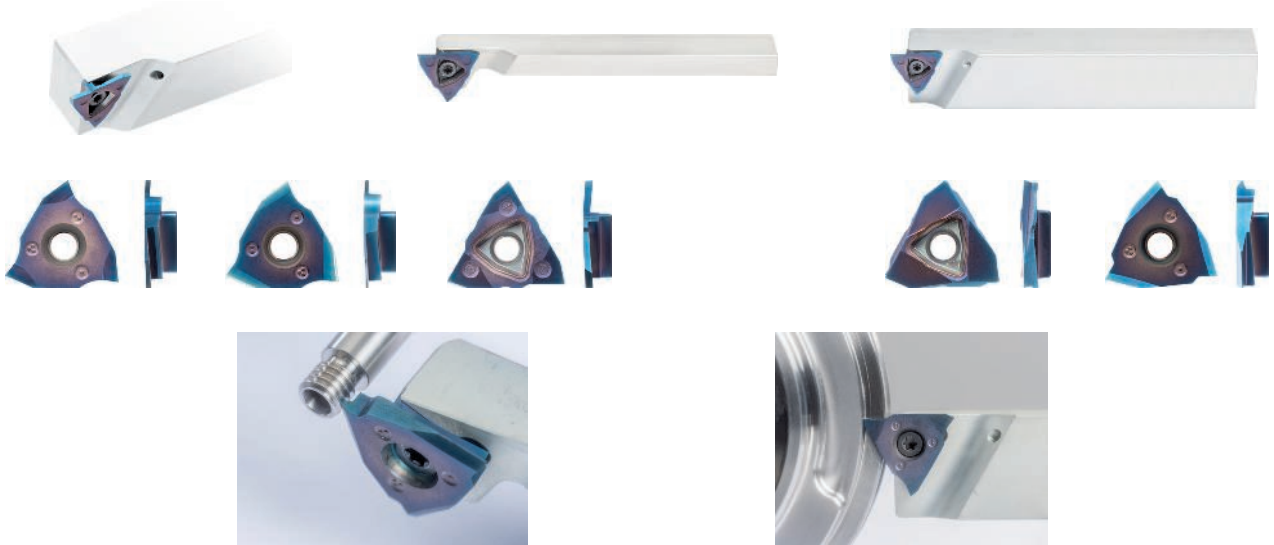
- Wide range of holders in various materials (steel, solid carbide)
- Innovative indexable inserts from the latest generation

17827035-060	SCLD offset solid carbide boring bar, positive, left For face turning and longitudinal turning using CD indexable insert	
17827105-140	SCUP offset solid carbide boring bar, positive, right For face and longitudinal turning using CP indexable insert	
17827185-220	SCXP offset solid carbide boring bar, positive, left For face and longitudinal turning using CP indexable insert	
17827295-320	SCLD solid carbide boring bar, positive left For face turning and longitudinal turning using CD indexable insert	
17827355-380	SVLC solid carbide boring bar, positive left For longitudinal and copy turning with VC indexable insert	
17827415-440	SVVC solid carbide boring bar, positive left For longitudinal and copy turning with VC indexable insert	
17827475-500	SVXC solid carbide boring bar, positive left For longitudinal and copy turning with VC indexable insert	
17827535-560	SV95C solid carbide boring bar, positive left For longitudinal and copy turning with VC indexable insert	
17827565-580	SWUC boring bar, solid carbide, positive For face turning and longitudinal turning using WC indexable insert	



Grooving and lathe system

For professional serial users



application:

the newly developed Atorn grooving and lathe system has been engineered for ambitious serial machinists. it covers the machining tasks grooving, tapping, thread cutting, lathing and recessing.

advantages:

- wide machining range with only one holder.
- high-performance cutting material and coating ensure a long service life and a wide machining range even in difficult materials such as stainless steel or titanium.
- 3 cutting edges make for a high level of profitability.
- high switching accuracy - can be changed directly on the machine.
- internal coolant supply ensures a long service life and high degree of process reliability.



ARE YOU LOOKING FOR
EVEN MORE BRANDS?

WE HAVE WHAT IT TAKES.

For a complete range of products that meet the toughest demands, visit www.iconridge.com



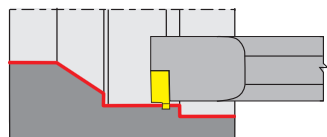
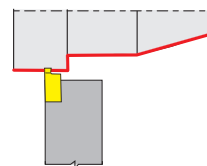
Cutting system with two-flute cutting insert

For demanding serial users



Holder

Boring bar



Application:

For grooving (circlips) and copy turning.

- Cutting insert precision-ground for maximum requirements around precision
- High-performance substrate for universal application in a wide range of materials
- Precise insert seating for high-precision lathe operations
- High-strength carrier material ensures long service life of carriers
- Just one cutting insert for internal and external machining

ORION® External holder for plunge inserts

For external recessing, for universal use up to 1300 N/mm²

Application:

For external plunging with plunge insert no. 17670.

Advantage:

- High-quality and hard-wearing steel holder
- Precision-machined plate seat

Execution:

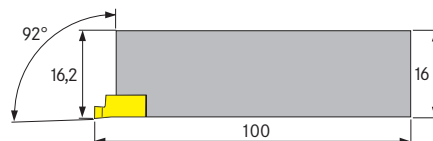
- Steel tool holder with high-strength clamping screw

Shank width (mm)			16
Shaft height (mm)			16
Tool design			Right
Length (mm)			100
Min. bore Ø (mm)			17.8
External holder for plunge inserts	17670...	Ident. No.	013
Clamping screw for 2-cutter indexable insert	17670...	Ident. No.	008

Prod. Gr. 159



Holder



ORION® Internal holder for plunge inserts

For internal recessing, for universal use up to 1300 N/mm²

Application:

For internal plunging with plunge insert no. 17670

Advantage:

- High-quality and hard-wearing steel holder
- Precision-machined plate seat

Execution:

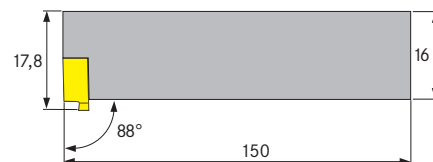
- Steel tool holder with high-strength clamping screw

Shaft Ø (mm)			16
Tool design			Right
Length (mm)			150
Min. bore Ø (mm)			17.8
Internal holder for plunge inserts	17670...	Ident. No.	018
Clamping screw for 2-cutter indexable insert	17670...	Ident. No.	008

Prod. Gr. 159



Boring bar



ORION® Recessing set circlips

For internal and external recessing, for universal use up to 1300 N/mm²

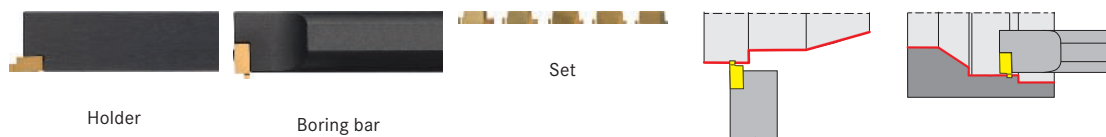
Application:
For internal and external plunging in steel (stainless steel), NF metal, cast and (special alloy) material groups in single part and series production.

Advantage:

- Universal use; for internal and external plunging
- Precision-ground plunge insert for long service life and precise plunging

Execution:

- External blade holder with right-hand shank 16 x 16, right boring bar with diameter of 16 (for min. bores of > 17.8 mm) and 5 x 2 plunge inserts no. 17670002-006



17670... | Ident. No. 001

Prod. Gr. 159

ORION® Cutting insert, 2-way cutter

For internal and external recessing, for universal use up to 1300 N/mm²

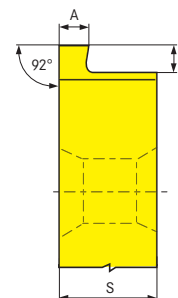
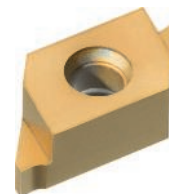
Application:
For internal and external plunging in steel (stainless steel), NF metal, cast and (special alloy) material groups in single part and series production.

Advantage:

- Universal use; for internal and external plunging
- Precision-ground plunge insert for long service life and precise plunging

Execution:

- Precision-ground plunge insert with two cutters, TiN coating



				Carbide type	OHC7620
				Material to be processed	Steel Stainless steel Non-ferrous metal Special alloy
				Vc in steel	80-200 m/min
				Vc in stainless steel	80-120 m/min
				Vc in non-ferrous metals	150-250 m/min
				Vc in cast iron	80-150 m/min
				Vc in special alloys	60-80 m/min
Nominal dimension of slot width (mm)	A (mm)	T (mm)	S (mm)	17670... Ident. No.	
1.1	1.2	1.2	4	002	●
1.3	1.4	1.2	4	003	●
1.6	1.7	1.5	4	004	●
1.85	1.95	1.8	4	005	●
2.15	2.25	2.0	4	006	●

Prod. Gr. 159

ORION® Cutting insert set, 2-way cutter

For internal and external recessing, for universal use up to 1300 N/mm²

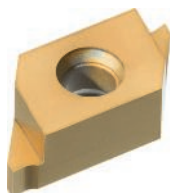
Application:
For internal and external plunging in steel (stainless steel), NF metal, cast and (special alloy) material groups in single part and series production.

Advantage:

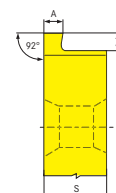
- Universal use; for internal and external plunging
- Precision-ground plunge insert for long service life and precise plunging

Execution:

- Precision-ground plunge insert with 2 cutters, TiN-coated, two in each plunge width of 1.1/1.3/1.6/1.85/2.15



Set



17670... | Ident. No. 007

Prod. Gr. 159



cutting system with triple-cutter cutting insert

For demanding serial users



Application:
For grooving (circlips and grooves).

- Cutting insert precision-ground for maximum requirements around precision
- Wide assortment of cutting widths
- High-performance substrate for universal application in a wide range of materials
- Precise insert seating for high-precision lathe operations
- High-strength carrier material ensures long service life of carriers

ORION® Blade holders for plunge inserts

For cutting circlip grooves

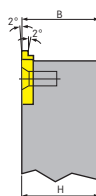
Application:
For external plunging for grooves and locking rings.

Advantage:

- High-quality, hard-wearing steel holder
- Precision-machined plate seat

Execution:

- Precision-machined steel holder, burnished and hardened



		!!Accessoires!! (cutter indexable insert)	Blade holders for plunge inserts		Clamping screw for 3-
B (mm)	H (mm)	Tool design	Right	Left	
			17670... Ident. No.	17670... Ident. No.	17670... Ident. No.
10	10	10.2	010 ●	110 ○	126 ●
12	12	12.2	012 ●	112 ●	126 ●
16	16	16.2	016 ●	116 ●	126 ●
20	20	20.2	020 ●	120 ●	126 ●
25	25	25.2	025 ●	125 ●	126 ●

Prod. Gr. 159

ORION® Plunge insert, 3-way cutter

For external recessing of grooves and circlips, for universal use up to 1300 N/mm²

Application:

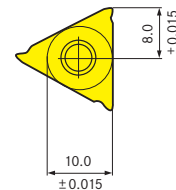
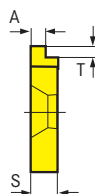
For external plunging for grooves and locking rings in steel, (stainless steel), cast, NF metal and (special alloy) material groups up to a strength of 1300 N/mm² in single part and series production.

Execution:

- Precision-ground plunge insert with three cutters, TiN coating

Advantage:

- Precision-ground cutting geometry with high-quality surface finish for universal use and long service life



					Machining direction	Right	Left
					Surface	TiN	TiN
					Vc in steel ●	70-200 m/min	70-200 m/min
					Vc in stainless steel ●	30-100 m/min	30-100 m/min
					Vc in non-ferrous metals ●	200-800 m/min	200-800 m/min
					Vc in cast iron ●	70-140 m/min	70-140 m/min
					Vc in special alloys ●	20-70 m/min	20-70 m/min
Nominal dimension of slot width (mm)	A (mm)	T (mm)	S (mm)	f min./max.	17670... Ident. No.	17670... Ident. No.	17670... Ident. No.
0.5	0.58	0.8	3	0-0.08 mm/U	130	●	150
0.7	0.78	0.8	3	0-0.08 mm/U	131	●	151
0.8	0.88	1	3	0-0.08 mm/U	132	●	152
0.9	0.98	1	3	0-0.08 mm/U	133	●	153
1.1	1.2	1.2	3	0-0.08 mm/U	134	●	154
1.3	1.4	1.4	3	0-0.08 mm/U	135	●	155
1.6	1.7	1.7	3	0-0.08 mm/U	136	●	156
1.85	1.95	1.95	3	0-0.08 mm/U	137	●	157
2.15	2.25	2.25	3	0-0.08 mm/U	138	●	158
2.65	2.75	2.75	3	0-0.08 mm/U	139	●	159
3.15	3.25	3.25	4	0-0.08 mm/U	140	●	160

Prod. Gr. 159

ORION® Plunge insert set, 3-way cutter

For external recessing of grooves and circlips, for universal use up to 1300 N/mm²

Application:

For external plunging for grooves and locking rings in steel, (stainless steel), cast, NF metal and (special alloy) material groups up to a strength of 1300 N/mm² in single part and series production.

Advantage:

- Precision-ground cutting geometry with high-quality surface finish, for universal use and long service life
- TiN coating for longer service life

Execution:

- Precision-ground plunge insert with three cutters and TiN coating



Composition of set		1 plunge insert of each of the following sizes: A 0.58; 0.78; 0.88; 0.98; 1.20; 1.40; 1.70; 1.95; 2.25; 2.75	
Machining direction		Ident. No.	
17670...	Right	Ident. No.	030
			●
17670...	Left	Ident. No.	031
			●

Prod. Gr. 159

ORION® HSSE lathe chisel, similar to DIN 4952, square (DIN Similar to 4952)
 For longitudinal and face planing, external, for universal use up to 1300 N/mm²

Application:

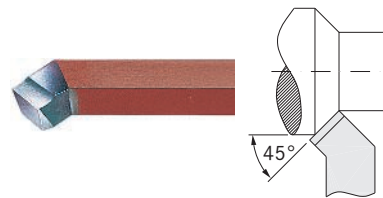
For external longitudinal turning and face turning for the material groups of steel, (stainless steel), cast iron, non-ferrous metals and (special alloys) up to a strength of 1300 N/mm².

Execution:

- HSSE butt-welded design, with varnished and square shank

Advantage:

- wear-resistant cutting material and high-quality grinding ensure a long service life



Shank width (mm)		10	12	16	20
Shaft height (mm)		10	12	16	20
Length (mm)		100	110	140	160
17068...	Ident. No.	130	160	190	220
		●	●	●	●

Prod. Gr. 159

ORION® HSSE corner lathe chisel, curved, similar to DIN 4965, square (DIN 4965)
 For corner lathing, external, for universal use up to 1300 N/mm²

Application:

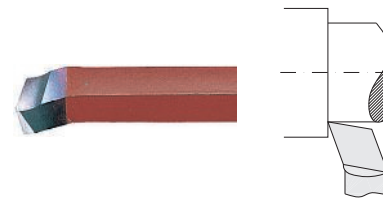
For external longitudinal turning and facing (cutting corners) in the material groups steel, (stainless steel), cast materials, non-ferrous metals and special alloys up to a strength of 1300 N/mm².

Execution:

- Butt-welded version in HSSE with painted, square shaft

Advantage:

- Wear-resistant cutting material and high-quality ground finish for a long service life



Shank width (mm)		10	12	16	20
Shaft height (mm)		10	12	16	20
Length (mm)		100	110	140	160
17075...	Ident. No.	110	121	130	160
		●	●	●	●

Prod. Gr. 159

ORION® HSSE side lathe chisel, offset, similar to DIN 4960, square (DIN Similar to 4960)
 For longitudinal lathing, external, for universal use up to 1300 N/mm²

Application:

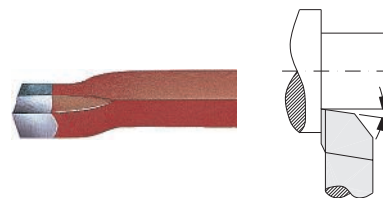
For external longitudinal turning in the material groups steel, stainless steel, cast materials, non-ferrous metals and special alloys up to a strength of 1300 N/mm².

Execution:

- Butt-welded version in HSSE with painted and square shaft

Advantage:

- Wear-resistant cutting material and high-quality ground finish for a long service life



Shank width (mm)		10	12	16	20
Shaft height (mm)		10	12	16	20
Length (mm)		100	110	140	160
17081...	Ident. No.	130	160	190	220
		●	●	●	●

Prod. Gr. 159

ORION® HSSE thread cutting chisel 60°, rectangular
 For turning metric male threads, for universal application up to 1300 N/mm²

Application:

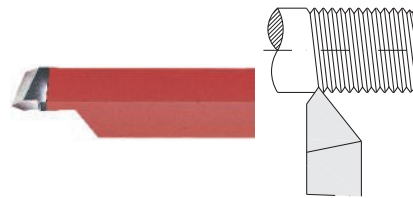
For cutting external, 60° threads in the material groups steel, stainless steel, cast materials, non-ferrous metals and special alloys up to a strength of 1300 N/mm².

Execution:

- Butt-welded version in HSSE with painted shaft

Advantage:

- Wear-resistant cutting material and high-quality ground finish for a long service life



Shank width (mm)		16	20	12	16	20
Shaft height (mm)		10	12	12	16	20
Length (mm)		125	140	110	140	160
Width of cutting edge (mm)		4	4	4	5	6
Shank type		Rectangular	Rectangular	Square	Square	Square
17093...	Ident. No.	210	220	270	280	290
		●	●	●	●	●

Prod. Gr. 159

ORION® HSSE cutting-off lathe tool, similar to DIN 4961, rectangular (DIN Similar to 4961)

For external cutting off, for universal use up to 1300 N/mm²

Application:

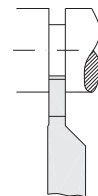
For external parting off in steel, (stainless steel), cast iron, non-ferrous metals and (special alloys) material groups up to a strength of 1300 N/mm².

Execution:

- butt-welded design with varnished and rectangular shank

Advantage:

- wear-resistant cutting material and high-quality grinding ensure a long service life



Shank width (mm)		16	20
Shaft height (mm)		10	12
Length (mm)		125	140
Recessing width (mm)		3	4
Plunge depth (mm)		12	16
17084...	Ident. No.	160	190
		●	●

Prod. Gr. 159

ORION® HSSE lathe chisel, similar to DIN 4953, square

For internal longitudinal lathing, for universal use up to 1300 N/mm²

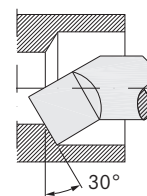
Application:

For internal longitudinal turning in steel, (stainless steel), cast iron, non-ferrous metals and (special alloys) material groups up to a strength of 1300 N/mm².

- Ident. No. 340–430: butt-welded design with varnished and round shank

Advantage:

- wear-resistant cutting material and high-quality grinding ensure a long service life

**Execution:**

- Ident. No. 130–250: butt-welded design with varnished and square shank

Shaft Ø (mm)		-	-	-	-	-	8	10	12	16
Shank width (mm)		8	10	12	16	20	-	-	-	-
Shaft height (mm)		8	10	12	16	20	-	-	-	-
Length (mm)		140	160	180	180	220	140	160	180	210
Min. bore Ø (mm)		14	18	21	27	34	14	18	21	27
17087...	Ident. No.	130	160	190	220	250	340	370	400	430
		●	●	●	●	●	●	●	●	●

Prod. Gr. 159

ORION® HSSE internal lathe chisel, similar to DIN 4954

For longitudinal turning, for universal use up to 1300 N/mm²

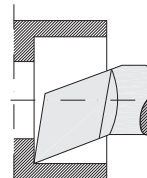
Application:

For internal longitudinal turning in steel, (stainless steel), cast iron, non-ferrous metals and (special alloys) material groups up to a strength of 1300 N/mm².

- Ident. No. 340–460: butt-welded design with varnished and round shank

Advantage:

- wear-resistant cutting material and high-quality grinding ensure a long service life

**Execution:**

- Ident. No. 130–250: precision-ground, butt-welded design with varnished and square shank

Shaft Ø (mm)		-	-	-	-	-	8	10	12	16	20
Shank width (mm)		8	10	12	16	20	-	-	-	-	-
Shaft height (mm)		8	10	12	16	20	-	-	-	-	-
Length (mm)		140	160	180	180	220	140	160	180	210	250
Min. bore Ø (mm)		14	18	21	27	34	14	18	21	27	34
17089...	Ident. No.	130	160	190	220	250	340	370	400	430	460
		●	●	●	●	●	●	●	●	●	●

Prod. Gr. 159

ORION® HSSE recessing lathe chisel, square (DIN Similar to 4963)

For internal recessing, for universal use up to 1300 N/mm²

Application:

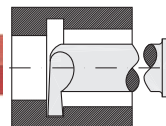
For internal grooving in steel, (stainless steel), cast iron, non-ferrous metals and (special alloys) material groups up to a strength of 1300 N/mm².

Execution:

- butt-welded design with varnished and square shank

Advantage:

- wear-resistant cutting material and high-quality grinding ensure a long service life



Shank width (mm)		8	10	12	16	20
Shaft height (mm)		8	10	12	16	20
Length (mm)		140	160	180	180	220
Recessing width (mm)		2	3	3	3	4
Max. turning depth (mm)		4	6	8	8	8
17091...	Ident. No.	220	230	260	290	320
		●	●	●	●	●

Prod. Gr. 159

ORION® HSSE recessing lathe chisel, round (DIN Similar to 4963)

For internal recessing, for universal use up to 1300 N/mm²

Application:

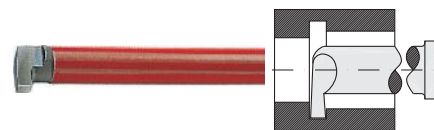
For internal grooving in steel, (stainless steel), cast iron, non-ferrous metals and (special alloys) material groups up to a strength of 1300 N/mm².

Execution:

- butt-welded design with varnished and round shank

Advantage:

- wear-resistant cutting material and high-quality grinding ensure a long service life



Shaft Ø (mm)	8	10	12	16	20
Length (mm)	140	160	180	220	250
Recessing width (mm)	2	3	3	4	5
Max. turning depth (mm)	4	6	8	10	14
17092... Ident. No.	220	230	260	290	320

Prod. Gr. 159

ORION® Thread turning tool, 60°, square

For internal thread cutting of metric male threads, for universal use up to 1300 N/mm²

Application:

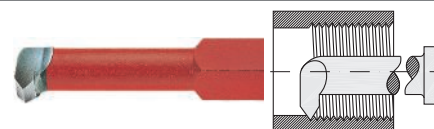
For cutting internal, 60° threads in the material groups steel, stainless steel, cast materials, non-ferrous metals and special alloys up to a strength of 1300 N/mm².

Execution:

- Butt-welded version with painted, round shaft

Advantage:

- Wear-resistant cutting material and high-quality ground finish for a long service life



Shank width (mm)	8	10	12	16	20
Shaft height (mm)	8	10	12	16	20
Length (mm)	140	160	180	220	250
Width of cutting edge (mm)	3.5	4	5	6	8
17095... Ident. No.	220	230	260	290	320

Prod. Gr. 159

ORION® Carbide-tipped recessing lathe chisel, rectangular (DIN 4981)

for external grooving, for universal use up to 1300 N/mm²

Application:

For external grooving in steel, (stainless steel), cast iron, non-ferrous metals and (special alloys) material groups up to a strength of 1300 N/mm².

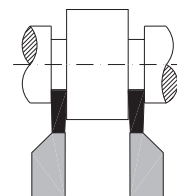
- Ident. No. 239, 269, 299, 329, 359: K 10-20 (high level of hardness) with painted and square shank

Advantage:**Execution:**

- Ident. No. 232, 262, 292, 322, 352: P 20 (medium hardness, ductility) with painted and square shank
- Ident. No. 234, 264, 294, 324, 354: P 25-30 (high ductility) with painted and square shank

- Ident. No. 232, 262, 292, 322, 352: Hard-wearing cutting material and precision-ground cutting geometry

- Ident. No. 234-239, 264-269, 294-299, 324-329, 354-359: wear-resistant cutting material and precision-ground cutting geometry



17638 = left, 17636 = right

Shank width (mm)	Shaft height (mm)	Length (mm)	Cutting edge length (mm)	Recessing width (mm)	Carbide type		
					P 20	P 25/30	K 10/20
12	8	100	12	3	17636... Ident. No.	17636... Ident. No.	17636... Ident. No.
16	10	110	14	4	232	234	239
20	12	125	16	5	262	264	269
25	16	140	20	6	292	294	299
32	20	170	25	8	322	324	329
					352	354	359

Prod. Gr. 159

ORION® HSSE round lathe blank (DIN 4964)
Round cross-section

Application:

For grinding individual tool geometries with round cross-section.

Advantage:

- top-quality and wear-resistant cutting material with high cobalt content
- precision-ground cross section with excellent surface quality

Execution:

- precision-ground and round bar made from HSSE, W9 Co 10 (1.3207), 10% cobalt and 64-67 HRC

Cutting material	Ø (mm)	Length (mm)	Tolerance of outer dimension	17052... Ident. No.	
HSSE	4	63	h14	420	●
HSSE	4	80	h14	430	●
HSSE	4	100	h14	435	●
HSSE	5	100	h14	465	●
HSSE	6	63	h14	480	●
HSSE	6	100	h14	500	●
HSSE	6	160	h14	507	●
HSSE	8	40	h14	510	●
HSSE	8	63	h14	520	●
HSSE	8	80	h14	530	●
HSSE	8	100	h14	540	●
HSSE	8	125	h14	550	●
HSSE	8	160	h14	560	●
HSSE	8	200	h14	565	●
HSSE	10	80	h14	590	●
HSSE	10	100	h14	600	●

Prod. Gr. 159

Cutting material	Ø (mm)	Length (mm)	Tolerance of outer dimension	17052... Ident. No.	
HSSE	10	125	h14	610	●
HSSE	10	160	h14	620	●
HSSE	10	200	h14	630	●
HSSE	12	100	h14	660	●
HSSE	12	160	h14	680	●
HSSE	12	200	h14	690	●
HSSE	14	125	h14	700	●
HSSE	14	160	h14	710	●
HSSE	16	125	h14	720	●
HSSE	16	200	h14	740	●
HSSE	18	160	h14	750	●
HSSE	18	200	h14	760	●
HSSE	20	125	h14	780	●
HSSE	20	160	h14	790	●
HSSE	20	200	h14	800	●

ORION® HSSE square lathe blank (DIN 4964)
Square cross-section

Application:

For grinding individual tool geometries with square cross section.

Advantage:

- top-quality and wear-resistant cutting material with high cobalt content
- precision-ground cross section with excellent surface quality

Execution:

- precision-ground and square bar made from HSSE, W9 Co 10 (1.3207), 10% cobalt and 64-67 HRC

Cutting material	Width (mm)	Height (mm)	Length (mm)	Tolerance of outer dimension	17054... Ident. No.	
HSSE	4	4	63	h14	421	●
HSSE	4	4	80	h14	431	●
HSSE	5	5	63	h14	451	●
HSSE	5	5	80	h14	461	●
HSSE	5	5	100	h14	465	●
HSSE	6	6	40	h14	470	●
HSSE	6	6	63	h14	480	●
HSSE	6	6	80	h14	490	●
HSSE	6	6	100	h14	500	●
HSSE	6	6	125	h14	510	●
HSSE	6	6	160	h14	520	●
HSSE	8	8	63	h14	540	●
HSSE	8	8	80	h14	550	●
HSSE	8	8	100	h14	560	●
HSSE	8	8	125	h14	570	●
HSSE	8	8	160	h14	580	●
HSSE	8	8	200	h14	585	●
HSSE	10	10	63	h14	590	●
HSSE	10	10	80	h14	600	●
HSSE	10	10	100	h14	610	●

Prod. Gr. 159

Cutting material	Width (mm)	Height (mm)	Length (mm)	Tolerance of outer dimension	17054... Ident. No.	
HSSE	10	10	125	h14	620	●
HSSE	10	10	160	h14	630	●
HSSE	10	10	200	h14	640	●
HSSE	12	12	80	h14	660	●
HSSE	12	12	100	h14	670	●
HSSE	12	12	125	h14	680	●
HSSE	12	12	160	h14	690	●
HSSE	12	12	200	h14	700	●
HSSE	14	14	100	h14	710	●
HSSE	14	14	125	h14	720	●
HSSE	14	14	160	h14	730	●
HSSE	14	14	200	h14	740	●
HSSE	16	16	100	h14	750	●
HSSE	16	16	125	h14	760	●
HSSE	16	16	160	h14	770	●
HSSE	16	16	200	h14	780	●
HSSE	20	20	160	h14	810	●
HSSE	20	20	200	h14	820	●
HSSE	20	20	250	h14	830	●
HSSE	25	25	250	h14	860	●

ORION® HSSE rectangular lathe blank (DIN 4964)
Rectangular cross-section

Application:

For grinding individual tool geometries with rectangular cross section.

Advantage:

- top-quality and wear-resistant cutting material with high cobalt content
- precision-ground cross section with excellent surface quality

Execution:

- precision-ground and rectangular bar made from HSSE, W9 Co 10 (1.3207), 10% cobalt and 64-67 HRC

Cutting material	Width (mm)	Height (mm)	Length (mm)	Tolerance of outer dimension	17062... Ident. No.	
HSSE	6	4	80	h14	411	●
HSSE	6	4	100	h14	421	●
HSSE	8	2	100	h14	425	●
HSSE	8	4	100	h14	441	●
HSSE	8	4	160	h14	450	●
HSSE	8	5	100	h14	471	●
HSSE	8	6	200	h14	472	●
HSSE	10	2	100	h14	473	●
HSSE	10	3	100	h14	475	●
HSSE	10	4	100	h14	476	●
HSSE	10	4	160	h14	477	●
HSSE	10	4	200	h14	478	●
HSSE	10	5	100	h14	491	●
HSSE	10	5	160	h14	501	●
HSSE	10	5	200	h14	511	●
HSSE	10	6	100	h14	521	●
HSSE	10	6	160	h14	531	●
HSSE	10	6	200	h14	540	●
HSSE	12	6	100	h14	551	●
HSSE	12	6	160	h14	560	●
HSSE	12	6	200	h14	570	●
HSSE	12	8	100	h14	580	●
HSSE	12	8	160	h14	590	●
HSSE	12	8	200	h14	600	●
HSSE	12	10	160	h14	605	●
HSSE	14	6	160	h14	607	●
HSSE	16	4	100	h14	620	●

Prod. Gr. 159

ORION® HSSE trapezoidal lathe blank (DIN 4964)

Trapezoidal cross-section

Application:

For grinding individual tool geometries with trapezoidal cross-section.

Execution:

- precision-ground and trapezoidal bar made from HSSE, W9 Co 10 (1.3207), 10% cobalt and 64-67 HRC

Advantage:

- top-quality and wear-resistant cutting material with high cobalt content
- precision-ground cross section with excellent surface quality



Shape E ① = width

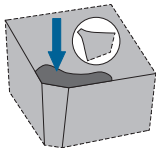
Cutting material	Width (mm)	Height (mm)	Length (mm)	Tolerance of outer dimension	17064... Ident. No.	
HSSE	2.5	10	80	h12	111	●
HSSE	2.5	10	125	h12	121	●
HSSE	3	12	160	h12	130	●
HSSE	4	16	100	h12	140	●

Prod. Gr. 159

Cutting material	Width (mm)	Height (mm)	Length (mm)	Tolerance of outer dimension	17064... Ident. No.	
HSSE	4	16	160	h12	150	●
HSSE	5	20	100	h12	170	●
HSSE	5	20	160	h12	180	●

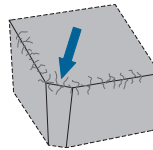


Indexable inserts - Types of wear and solution proposals



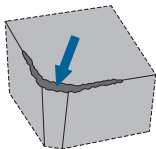
Built-up edges

- Select cutting material types with less friction resistance
- Increase the cutting speed
- Increase the feed
- Do not use water-soluble coolant
- Check coolant use
- Check indexable insert classification
- Check chip breaker selection
- Increase clearance angle
- Reduce chamfer and rounding of cutting edge



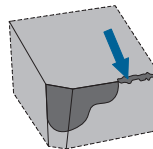
Ridge cracking at the cutting edge

- Select cutting material type less sensitive to temperature fluctuations
- Reduce cutting speed
- Reduce feed
- Reduce cutting depth
- Do not use water-soluble coolant
- Check coolant use
- Check chip breaker selection
- Increase clearance
- Reduce chamfer and rounding of cutting edge



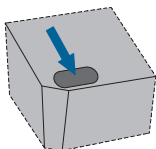
Brittle damage to the cutting edge

- Use tougher cemented carbide type
- Select less intensive cutting conditions
- Apply different cutting edge geometry
- Reduce feed when inserting into opening



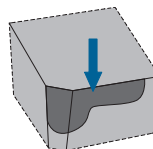
Damage to the cutting edge (outside opening)

- Change feed
- Select tool with different adjustment angle
- Apply different cutting edge geometry (different chip former)
- Use tougher cemented carbide type



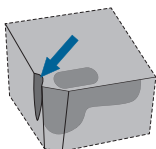
Scour wear

- Select harder cutting material
- Reduce cutting speed
- Reduce feed
- Reduce cutting depth
- Check coolant use
- Check chip breaker selection
- Increase clearance angle



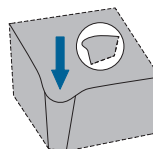
Breaking of cutting edge

- Select tougher cutting material
- Select cutting material type less sensitive to temperature fluctuations
- Reduce feed
- Reduce cutting depth
- Check chip breaker selection
- Increase size of chamfer and rounding of cutting edge
- Select machine with higher performance and rigidity



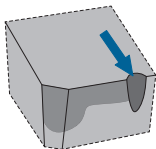
Oxidation gouging on secondary cutting edge

- Apply coated or wear-resistant cemented carbide types, if possible apply coated indexable inserts with Al₂O₃ content.
- Apply cooling emulsion or Increase cooling intensity
- Reduce cutting speed



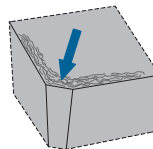
Plastic deformation

- Apply wear-resistant cemented carbide type
- Reduce cutting speed
- Reduce feed
- Apply cooling emulsion or Increase cooling intensity
- Apply indexable inserts with a larger rounding radius of the tip
- Apply indexable inserts with larger tip angle



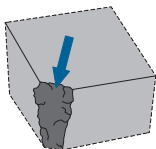
Notch wear on main cutting edge

- Apply coated or wear-resistant cemented carbide type, if possible apply coated indexable inserts with Al₂O₃ content.
- Use tool with a smaller adjustment angle
- Distribute chip unevenly



Fatigue crack along the open space

- Select tougher cemented carbide type
- Change retracting and extending of tool
- Change contact conditions
- Apply different cutting edge geometry or Indexable inserts with a different design of cutting edge
- Change feed



Breaking of cutting edge

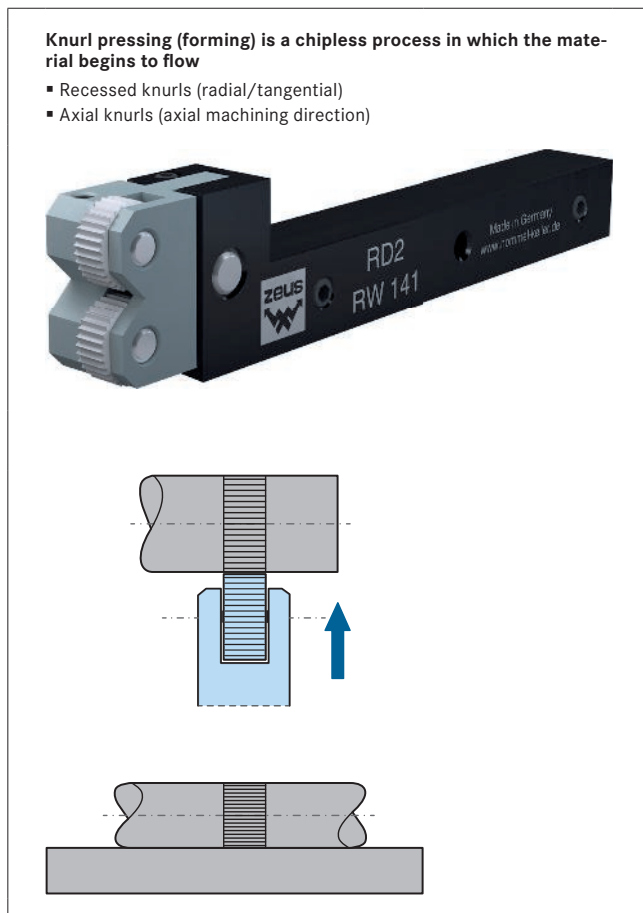
- Select tougher cutting material
- Select cutting material type less sensitive to temperature fluctuations
- Reduce feed
- Reduce cutting depth
- Check chip breaker selection
- Increase size of chamfer and rounding of cutting edge
- Select machine with higher performance and rigidity



Knurling - process

The knurling process is used for the defined production of surfaces. In principle, a knurl serves as a power transmission element on components that are operated manually. Through the knurling process, the surface on the component is raised and higher forces can be transmitted. The process is used in all sectors from the watchmaking industry to mechanical engineering. Knurling can be applied to a wide range of materials.

A distinction is made between two basic knurling processes:

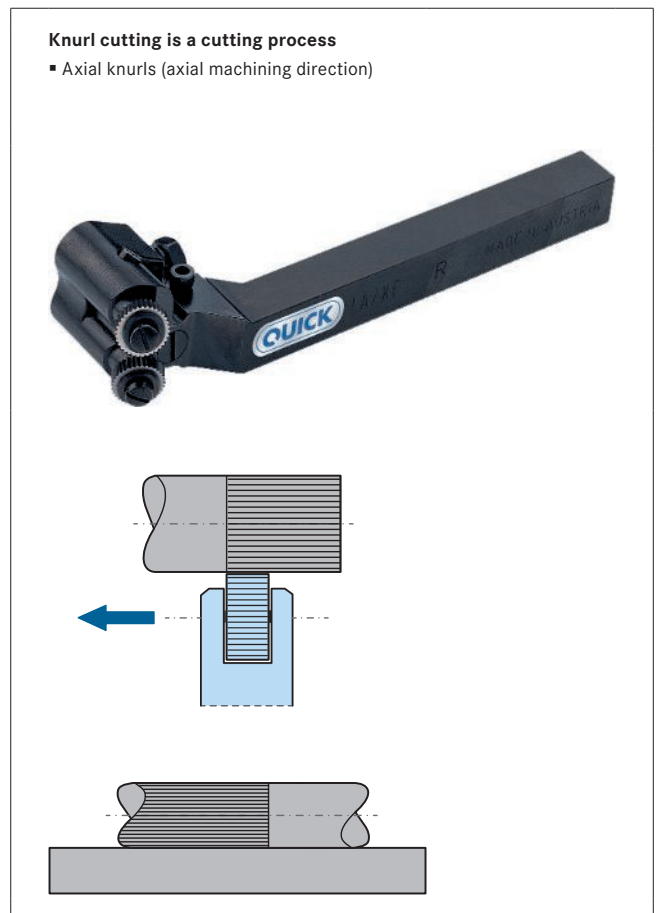


advantages of knurl pressing:

- cost-effective production of a knurl possible
- high stability as the fibre structure is not interrupted
- clean blank surface

disadvantages of knurl pressing:

- Enlargement of the diameter
- The final diameter must be calculated
- High force exertion resulting in high stress on machine and workpiece
- Risk of flaking of the material
- Limitation of the components to be manufactured (very thin-walled components cannot be machined)



Advantages of knurl cutting:

- small structure of workpiece diameter as material is cut
- low surface compaction
- high precision and surface quality of the knurl
- machining of difficult-to-cut materials (VA steels)
- machining of plastics (flat knurl preferred)
- stress reduction on the machine guides (low radial pressures)
- use in CNC lathes (series production, process safety)
- VDI direct intake (VDI 16 to VDI 50)
- knurling of thin-walled tubing without deformation of the workpiece
- diameter tolerances of up to ± 0.05 mm achievable
- use as left-, right-hand and conventional tool: No tool available on the market offers these application options. Thanks to the patented adjustment mechanism, it is possible to transform a right-hand tool into a left-hand tool and vice versa, without dismantling the carrier. The carrier can be moved 25 mm in relation to the clamping shaft and fixed in any position. These tools can therefore be used on CNC and conventional machines at will.

Disadvantages of knurl cutting:

- limited application range: only knurl profiles RAA and RGE are producible; only cylindrical workpieces can be machined in the axial machining direction
- a recess is required to place the tool in the centre area of the workpiece.
- Time-consuming machining resulting in high cost
- Lower stability. Fibre structure is interrupted and notching effect produced
- Precise tool setting and fine-tuning as well as precise preparation of the workpiece are also required



Technical information, knurl pressing

In knurl pressing, the material is subject to chipless deformation. The material is cold-formed via the knurling wheel and flows outwards. This forming process increases the diameter of the workpiece. The following list provides an overview of bulging for the various pitches and materials.

the most suitable knurling materials are:

- All ferrous materials with a stability of max. 1700 N/mm² and an elongation of at least 4 - 5%
- Non-ferrous base metals
- Hardwood
- Plastic corresponding to the requirements of the elongation and tensile strength

An increase in diameter is a particular characteristic of knurl forming. A diameter increase of approx. 40% of the used knurling pitch is considered an empirical value for larger initial diameters. the initial diameter can be calculated according to the following formula:


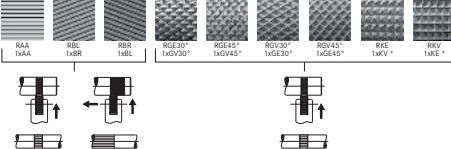

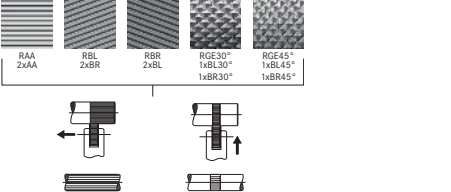

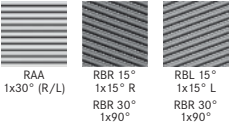

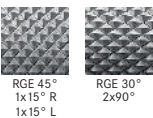
$$d_2 = d_1 - (X \cdot t)$$

d₂ = Starting diameter (rotation diameter) [mm]
 d₁ = End diameter [mm]
 X = The value X can be derived from the following table
 t = Pitch

Knurl form	Value X
Parallel to axis, form AA	0.50
Left knurl, form BL	0.50
Right knurl, form BR	0.50
Cross knurl, tips raised, form KE	0.67
Cross knurl, tips recessed, form KV	0.33
Left/right knurl, tips raised, form GE	0.67
Left/right knurl, tips recessed, form GV	0.33



Application of knurl pressing and knurl cutting based on number of knurls

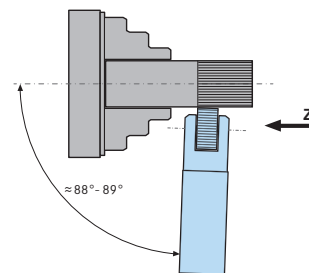
	Knurling wheels	Description	
Knurl pressing	1	<ul style="list-style-type: none"> ▪ For recess knurls with various recess profiles ▪ Axial knurls are only possible with knurling wheels of form AA ▪ Knurling tools for recess knurling are clamped at 90° and knurling tools for axial knurling at 88° to the workpiece (prevention of material congestion towards front edge of the knurling wheel) 	 
	2	<ul style="list-style-type: none"> ▪ For recess knurls with various recess profiles ▪ Axial knurls are only possible with knurling wheels of form AA (knurling parallel to axis) and forms BL + BR (left/right knurling) ▪ Knurling tools for recess knurling are clamped at 90° and knurling tools for axial knurling at 88° to the workpiece (prevention of material congestion towards front edge of the knurling wheel) 	 
Knurl cutting	1	<ul style="list-style-type: none"> ▪ Exclusively for knurls parallel to the axis (RAA) ▪ For left-hand tools, a knurl cutter roller BL 30° is used and for right-hand tools, a knurl cutter roller BR 30° ▪ Tools must be clamped at right angles to the workpiece ▪ Marking points for the precise tip height are indicated on the side of the head; for tools for CNC machines, the top edge of the shaft is the reference edge 	 
	2	<ul style="list-style-type: none"> ▪ Facilitates left/right knurling (RGE) with 30° and with 45° spiral ▪ For knurls RGE 30°, two knurl cutter rollers AA are inserted into the tool; for RGE 45° knurls, one knurl cutter wheel BR 15° and one knurl cutter wheel BL 15° ▪ The workpiece diameter and the exact tip height is set using the adjustment scale. Prior to the actual milling process, guide the tool against the workpiece and check whether the two knurl cutter rollers engage simultaneously 	 



Procedures and process parameters, knurl forming

Key steps

1. Tool setting - tip height
2. Clearance angle: max. 1° (only in the case of axial machining and wide projection lengths)
3. Infeed depth = pitch (for example 1 mm pitch requires 1 mm infeed in \emptyset)
4. Repeated insertion into profile possible
5. Knurling depth only sufficiently deep to produce sharp knurl
6. After a dwell time of 3-10 rotations, the workpiece is knurled under longitudinal feed
7. If the dwell time is too long, flaking may occur
8. Compliance with X-zero position for tangential tools



Reference values for process parameters

Material *	Workpiece diameter * (mm)	Speed n (rpm) *	Radial feed f (mm/r) *	Axial feed f (mm/r) *	Infeed depth (mm)
Up to a maximum of RM = 1000 N/mm ²	10	650	0.08-0.1	0.08-0.1	$p = \emptyset$
Up to a maximum of RM = 1000 N/mm ²	50	160	0.08-0.1	0.08-0.1	$p = \emptyset$
Up to a maximum of RM = 1000 N/mm ²	100	100	0.08-0.1	0.08-0.1	$p = \emptyset$

Note: The specified values (initial values) are recommendations and must be optimized in the application.

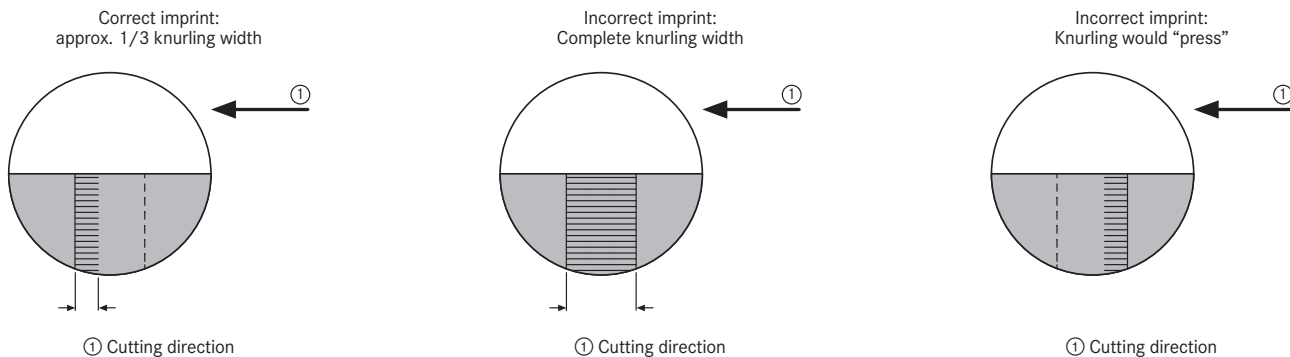
* The professional quality as well as the wear of the knurling wheels depend on:

- The combination of workpiece diameter and speed
- The feed
- The material
- The application (e.g. clamping situation - one- or two-sided)



Procedures and process parameters, knurl cutting
Key steps

1. Tool setting - tip height
2. Align knurling wheels: Wheel must taper slightly on the spindle-side edge (approx. 1/3 of the wheel width)
3. Clearance angle: 1° - max. 3°
4. Infeed depth = pitch (for example 1 mm partition requires 1 mm infeed in Ø)
5. Knurling depth only sufficiently deep to produce sharp knurl
6. After a dwell time of 3-10 rotations, the workpiece is knurled under longitudinal feed



Reference values for process parameters

Material *	Workpiece diameter * (mm)	Speed n (rpm) *	Radial feed f (mm/r) *	Axial feed f (mm/r) *	Infeed depth (mm)
Up to a maximum of RM = 1000 N/mm ²	10	1000	0.08-0.1	0.1-0.15	p = Ø
Up to a maximum of RM = 1000 N/mm ²	50	500	0.08-0.1	0.1-0.15	p = Ø
Up to a maximum of RM = 1000 N/mm ²	100	300	0.08-0.1	0.1-0.15	p = Ø

Note: The specified values (initial values) are recommendations and must be optimized in the application.

* The professional quality as well as the wear of the knurling wheels depend on:

- The combination of workpiece diameter and speed
- The feed
- The material
- The application (e.g. clamping situation - one- or two-sided)

Form knurling tool with one knurl (RD1 series, model 131)

For form knurling on lathes and turning machines

ORION® Jointed hose system set
Stainless steel jointed hose systems

Application:
Basic set for setting up an individual coolant system.

- Ident. No. 450–456: fork wrench SW 20 included



Execution:

- made from rust-free stainless steel (1.4301)
- suitable up to at least 40 bar operating pressure
- with short combinations, positive operating pressures up to 80 bar are possible
- SW 11 and 16 width across flats on 6-mm system
- Clamping width 14 and 20 across flats on 8.8-mm system

Advantage:

- universal, expandable screw system
- will not push away due to pressure, vibration or chips
- extremely long service life, resistant to corrosion
- resistant to temperature and chemical substances
- absolutely rigid and individually adjustable thanks to screw coupling

Length (mm)	Composition of set	System design	
		6 mm	8.8 mm
		18300... Ident. No.	18300... Ident. No.
150	Round nozzle dia. 4.5 mm, 3 x 25 mm spacers, 1 x 40 mm spacers, 1/8" adapter	410 ●	-
150	Round nozzle dia. 4.5 mm, 3 x 25 mm spacers, 1 x 40 mm spacers, 1/4" adapter	412 ●	-
225	Round nozzle dia. 4.5 mm, 6 x 25 mm spacers, 1 x 40 mm spacers, 1/8" adapter	406 ●	-
225	Round nozzle dia. 4.5 mm, 6 x 25 mm spacers, 1 x 40 mm spacers, 1/4" adapter	408 ●	-
365	Round nozzle dia. 4.5 mm, 10 x 25 mm spacers, 2 x 40 mm spacers, 1/8" adapter	402 ●	-
365	Round nozzle dia. 4.5 mm, 10 x 25 mm spacers, 2 x 40 mm spacers, 1/4" adapter	404 ●	-
230	Round nozzle dia. 8.8 mm, 6 x 37 mm spacers, 1/4" adapter	-	454 ●
230	Round nozzle dia. 8.8 mm, 6 x 37 mm spacers, 3/8" adapter	-	456 ●
325	Round nozzle dia. 8.8 mm, 8 x 37 mm spacers, 1 x 80 mm spacers, 1/4" adapter	-	450 ●
325	Round nozzle dia. 8.8 mm, 8 x 37 mm spacers, 1 x 80 mm spacers, 3/8" adapter	-	452 ●

Prod. Gr. 1FH

ORION® Ball valve
For stainless steel jointed hose systems

Application:
For blocking and regulating the coolant flow.

- Clamping width 14 and 20 across flats on 8.8-mm system

Execution:

- suitable up to at least 40 bar operating pressure
- connecting thread to fit every machine
- SW 11 and 16 width across flats on 6-mm system

Advantage:

- extremely long service life
- resistant to temperature and chemical substances
- fully rigid and individually adjustable thanks to screw coupling

	Outer thread dimension	Inner thread dimension	System design		18300... Ident. No.	
			6 mm	8.8 mm	18300... Ident. No.	
	G 1/8 inch	G 1/4 inch	6 mm	8.8 mm	442	●
	G 1/4 inch	G 1/4 inch	6 mm	8.8 mm	444	●
	G 3/8 inch	G 1/4 inch	6 mm	8.8 mm	446	●
	G 1/2 inch	G 1/4 inch	6 mm	8.8 mm	448	●

Prod. Gr. 1FH








**DO YOU WANT AN EVEN BIGGER
CHOICE OF MACHINING TOOLS?**

WE HAVE WHAT IT TAKES.

For a complete range of products that meet the toughest demands, visit www.iconridge.com

Tool clamp	
	Technical introduction – tool chucks
	Tool chucks DIN 69893 HSK 63/100
	Tool chucks ISO 7388-1 SK 40/50
	Tool chucks ISO 7388-2 BT40/50
	Tool extension with straight shank
	Pull stud/coolant transfer pipe
	Collet chuck type ER
	WZF and OZ collet chucks/ collet chucks with SK 40
	Collet chucks for ERICKSON system
	Clamping nuts and tool
	Mill arbour rings, cutter retaining screws and carrier rings
	Tapping chucks and accessories
	Thread cutting apparatus
	Reducing/extension sleeves
	Drill chucks
	Morse taper arbours and ejector drifts

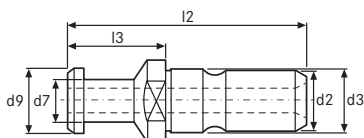
Tool clamp	
	Shrink units and accessories
	Setting and measuring instruments
	Technical introduction – tool presetters
	Overview page - tool presetters
	Tool holders for conventional lathes



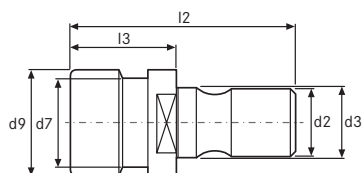
tool chucks in accordance with ISO 7388-1
old standard DIN 69871-1 was replaced by ISO 7388-1 (dimensions are identical)

for the tool chucks in accordance with new type ISO 7388-1

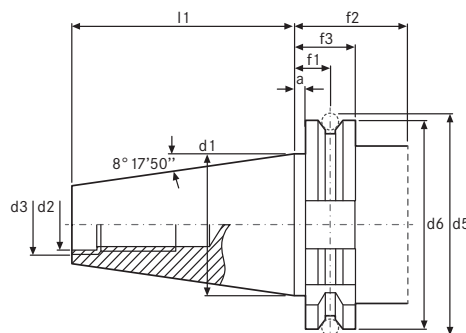
- type A** without through-bore
- type AD** with through-bore (for central coolant feed)
- type AF** with side coolant supply feed across the tool collar (old type designation was type B)
- type AD/AF** with through-bore and with side coolant feed through the tool collar. (old type specification was AD/B)



pull stud 69872



pull stud ISO 7388/B



ISO 7388-1

pull stud 69872 and ISO 7388/B

design	steep taper size	d ₂	d ₃ g6	d ₇	d ₉	l ₂	l ₃
ISO 7388/B	40	M16	17	12,95	18,95	44,5	16,4
	50	M24	25	19,6	29,1	65,5	25,55
DIN 69872	30	M12	13	9	13	44	24
	40	M16	17	14	19	54	26
	50	M24	25	21	28	74	34

steep taper ISO 7388-1

steep taper size	a ^{+0.1}	b ^{H12}	d ₁	d ₂	d ₃ ^{H7}	d ₅ ^{+0.05}	d _{6-0.1}	d ₈ max.	f ₁ ^{+0.1}	f ₂ min.	f ₃ ^{-0.1}	l ₁ ^{-0.3}	l ₅ ^{-0.3}	l ₆ ^{-0.4}	l ₇ ^{-0.4}
30	3,2	16,1	31,75	M12	13	59,3	50	45	11,1	35	19,1	47,8	15	16,4	19
40	3,2	16,1	44,45	M16	17	72,3	63,55	50	11,1	35	19,1	68,4	18,5	22,8	25
50	3,2	25,7	69,85	M24	25	107,35	97,5	80	11,1	35	19,1	101,75	30	35,5	37,7

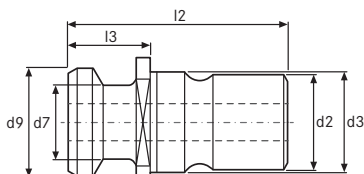
all dimensions in mm



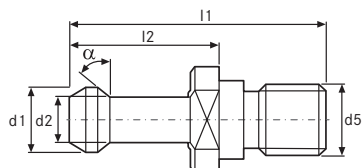
tool chucks in accordance with ISO 7388-2
old standard JIS B 6339 MAS BT was replaced by ISO 7388-2

for the tool chucks in old type JIS B 6339 MAS BT NORM

- type A** without through-bore
- type AD** with through-bore (for central coolant feed)
- type B** with side coolant feed across the tool collar
- type AD/B** with through-bore and with side coolant feed through the tool collar



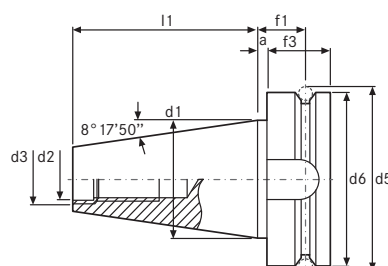
ISO 7388/B



pull stud compliant with JIS standard MAS BT 30° and 45°

for the tool chucks in accordance with new type ISO 7388-2

- type J** without through-bore
- type JD** with through-bore (for central coolant feed)
- type JF** with side coolant feed across the tool collar
- type JD/JF** with through-bore and with side coolant feed through the tool collar



ISO 7388-2

pull stud 7388/B

design	steep taper no.	d ₂	d ₃ g6	d ₇	d ₉	l ₂	l ₃
ISO 7388/B	40	M16	17	12,95	18,95	44,5	16,4
	50	M24	25	19,6	29,1	65,5	25,55

pull stud compliant with JIS standard

	d ₅	d ₁	d ₂	l ₁	l ₂	angle α
MAS BT I	M16	15	10	60	35	45°
MAS BT II	M16	15	10	60	35	30°
MAS BT I	M24	23	17	85	45	45°
MAS BT II	M24	23	17	85	45	30°

steep taper ISO 7388-2

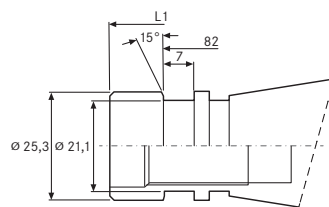
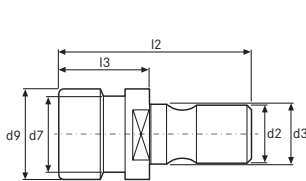
steep taper size	a ±0.1	b ^{H12}	d ₁	d ₂	d ₃ ^{H7}	d ₅ -0.1	d ₆ -0.05	f ₁ ±0.1	f ₃	l ₁ ±0.2	l ₄ -0.25
40	2	16,1	44,45	M16	17	69,68	63	16,6	25	65,4	22,5
50	3	25,7	69,85	M24	25	110	100	23,2	35	101,8	35,3



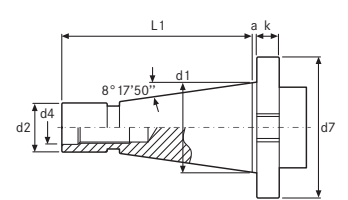
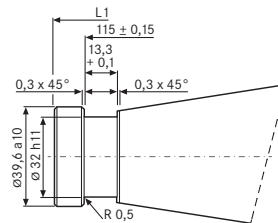
standard for steep tapers in accordance with DIN 2080 and corresponding pull studs

pull stud Ott-ring groove on spindle nose DIN 2079

only in conjunction with stones type C



tool chuck compliant with DIN 2080



Ott-ring groove pull stud

design	steep taper size	d ₂	d ₃ g6	d ₇	d ₉	l ₂	l ₃
Ott-ring groove	40	M16	17	21,1	25	53,1	25

tool chuck DIN 2080

steep taper size	a ^{±0.2}	b ^{H12}	d ₁	d ₂ a10	d ₇ ^{-0.1}	d ₄	k ^{±0.15}	l ₁	l ₂ max.
30	1,6	16,1	31,75	17,4	50	M12	8	68,4	16,2
40	1,6	16,1	44,45	25,3	63	M16	10	93,4	22,5
50	3,2	25,7	69,85	39,6	97,5	M24	12	126,8	35,3

all dimensions in mm



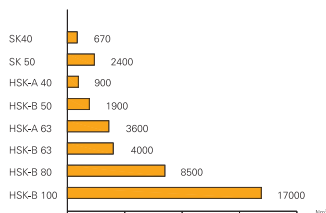
Hollow shank taper tools For automatic and manual tool exchange

tool chuck HSK-32/40/50/63/80/100 types A to F

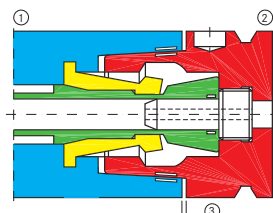
To prepare a quotation, we need your spindle size and possible tool chucks.

Advantages vis-à-vis steep taper:

- **High rigidity:** considerably greater bending strength is achieved with the same tool sizes as a result of the support at the collar (flange).
- **Excellent change precision:** the flange attachment facilitates axial positioning precision in the µm range. The form-fit, tight taper tolerance prevents any radial run-out.

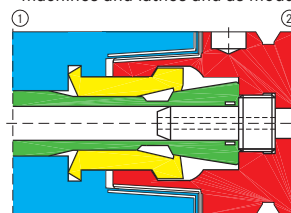


Radial nominal rigidity of various machine tool interfaces



Functional principle of the HSK interface
① Spindle, ② Tool, ③ Free space

- **Good torque transmission:** the hollow shank taper is held in the receiving spindle so that torque transmission is possible as a result of friction contact. 2 carrier blocks also engage in the slots at the shank end.
- **Ideal for high rotation speeds:** at high rotation speeds the spindle expands due to centrifugal force. This could cause the steep taper to slip in the spindle and jam. This is prevented by the flange. In addition, the clamping elements are pushed outwards by centrifugal force which increases the clamping force.
- **Integrated tool system:** the hollow shank taper was designed for both stationary and rotating tool chucks. This enables the tool holders to be used on milling machines and lathes and as modular tools.



Connecting position with locating faces
① Spindle, ② Tool



Clamping situation with locating faces

ORION® Surface chuck (Weldon) HSK-A (DIN 69893-1)



Application:

For clamping tools with straight shanks and clamping surfaces in line with DIN 1835 B.

Execution:

- All tapers and tolerances are precision-ground
- Cone tolerance AT3

- Strength HRC 57-60
- Core strength 1000-1200 N/mm²
- With Balluff chip hole
- All functional surfaces machined

Advantage:

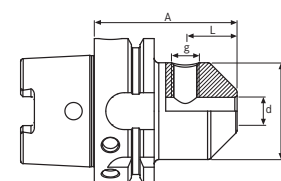
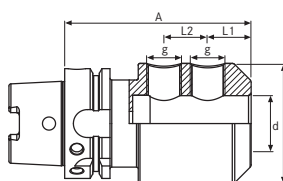
- Prevents rotation of tool while maintaining high concentricity



Ident. No. 200-226



Ident. No. 250-270



Tool holding device	d (mm)	A (mm)	D (mm)	L (mm)	L1 (mm)	L2 (mm)	g / G	23157... Ident. No.
HSK 63	6	65	25	18	-	-	M6	200 ●
HSK 63	6	100	25	18	-	-	M6	201 ●
HSK 63	6	160	25	18	-	-	M6	202 ●
HSK 63	8	65	28	18	-	-	M8	203 ●
HSK 63	8	100	28	18	-	-	M8	204 ●
HSK 63	8	160	28	18	-	-	M8	205 ●
HSK 63	10	65	35	20	-	-	M10	206 ●
HSK 63	10	100	35	20	-	-	M10	207 ●
HSK 63	10	160	35	20	-	-	M10	208 ●
HSK 63	12	80	42	22.5	-	-	M12	209 ●
HSK 63	12	100	42	22.5	-	-	M12	210 ●
HSK 63	12	160	42	22.5	-	-	M12	211 ●
HSK 63	14	80	44	22.5	-	-	M12	212 ●
HSK 63	14	100	44	22.5	-	-	M12	213 ●
HSK 63	14	160	44	22.5	-	-	M12	214 ●
HSK 63	16	80	48	24	-	-	M14	215 ●
HSK 63	16	100	48	24	-	-	M14	216 ●
HSK 63	16	160	48	24	-	-	M14	217 ●
HSK 63	18	80	50	24	-	-	M14	218 ●
HSK 63	18	100	50	24	-	-	M14	219 ●
HSK 63	18	160	50	24	-	-	M14	220 ●
HSK 63	20	80	52	25	-	-	M16	221 ●
HSK 63	20	100	52	25	-	-	M16	222 ●
HSK 63	20	160	52	25	-	-	M16	223 ●

Prod. Gr. 2AC

Tool holding device	d (mm)	A (mm)	D (mm)	L (mm)	L1 (mm)	L2 (mm)	g / G	23157... Ident. No.
HSK 63	25	110	65	-	24	25	M18 x 2	224 ●
HSK 63	32	110	72	-	24	28	M20 x 2	225 ●
HSK 63	40	125	80	-	30	32	M20 x 2	226 ●
HSK 100	6	80	25	18	-	-	-	250 ●
HSK 100	6	160	25	18	-	-	-	251 ●
HSK 100	8	80	28	18	-	-	-	252 ●
HSK 100	8	160	28	18	-	-	-	253 ●
HSK 100	10	80	35	20	-	-	-	254 ●
HSK 100	10	160	35	20	-	-	-	255 ●
HSK 100	12	100	42	22.5	-	-	-	256 ●
HSK 100	12	160	42	22.5	-	-	-	257 ●
HSK 100	14	100	44	22.5	-	-	-	258 ●
HSK 100	14	160	44	22.5	-	-	-	259 ●
HSK 100	16	100	48	24	-	-	-	260 ●
HSK 100	16	160	48	24	-	-	-	261 ●
HSK 100	18	100	50	24	-	-	-	262 ●
HSK 100	18	160	50	24	-	-	-	263 ●
HSK 100	20	100	52	25	-	-	-	264 ●
HSK 100	20	160	52	25	-	-	-	265 ●
HSK 100	25	100	65	-	24	25	-	266 ●
HSK 100	25	160	65	-	24	25	-	267 ●
HSK 100	32	120	72	-	24	28	-	268 ●
HSK 100	32	160	72	-	24	28	-	269 ●
HSK 100	40	120	80	-	30	32	-	270 ●

ORION® Surface chuck (Weldon) with coolant bores (DIN 69893-1)
 KKB= resealable cooling duct holes



Application:
 for clamping tools with straight shanks and clamping surfaces in line with DIN 1835 B.

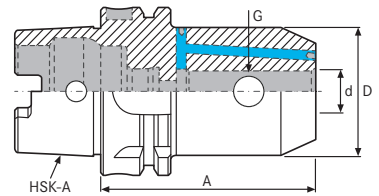
Execution:

- all tapers and tolerances are precision-ground
- cone tolerance AT3
- strength HRC 57-60

- core strength 1000-1200 N/mm²
- with Balluff chip hole
- all functional surfaces machined
- KKB= resealable coolant bores

Advantage:

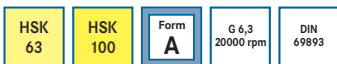
- prevents rotation of tool while maintaining high concentricity



Tool holding device	d (mm)	A (mm)	D (mm)	g / G	23157... Ident. No.	
HSK 63	6	65	25	M6	501	●
HSK 63	6	100	25	M6	502	●
HSK 63	6	160	25	M6	503	●
HSK 63	8	65	28	M8	504	●
HSK 63	8	100	28	M8	505	●
HSK 63	8	160	28	M8	506	●
HSK 63	10	65	35	M10	507	●
HSK 63	10	100	35	M10	508	●
HSK 63	10	160	35	M10	509	●
HSK 63	12	80	42	M12	510	●
HSK 63	12	100	42	M12	511	●
HSK 63	12	160	42	M12	512	●
HSK 63	14	80	44	M12	513	●
HSK 63	14	100	44	M12	514	●
HSK 63	14	160	44	M12	515	●
HSK 63	16	80	48	M14	516	●
HSK 63	16	100	48	M14	517	●
HSK 63	16	160	48	M14	518	●
HSK 63	18	80	50	M14	519	●
HSK 63	18	100	50	M14	520	●
HSK 63	18	160	50	M14	521	●
HSK 63	20	80	52	M16	522	●
HSK 63	20	100	52	M16	523	●
HSK 63	20	160	52	M16	524	●
HSK 63	25	110	65	M18 x 2	525	●
HSK 63	25	160	65	M18 x 2	526	●
HSK 63	32	110	72	M20 x 2	527	●
HSK 63	32	160	72	M20 x 2	528	●
HSK 63	40	125	80	M20 x 2	529	●
HSK 63	40	160	80	M20 x 2	530	●

Prod. Gr. 295

ORION® Combination shell end mill arbors (DIN 6358) (DIN 69893-1)



Application:

For holding shell end mills and single angle milling cutters with longitudinal groove in line with DIN 842.

- Concentricity < 0.005 mm
- With hole for Balluff chip

Notes:

If desired with combined shell end mill arbors with ICS, the cutter retaining screws must be ordered separately with IC DIN 6367, ref. no. 23185130-180

Execution:

- All functional surfaces machined

Delivery:

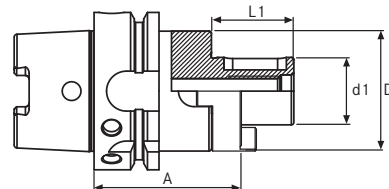
With cutter retaining screw, key and driving ring.



Ident. No. 200-210, 212-214



Ident. No. 250-254



Tool holding device	d1 (mm)	L1 (mm)	A (mm)	D (mm)	Coolant supply	23160... Ident. No.
HSK 63	16	27	60	32	No	200
HSK 63	16	27	100	32	No	201
HSK 63	16	27	160	32	No	202
HSK 63	22	31	60	40	No	203
HSK 63	22	31	100	40	No	204
HSK 63	22	31	160	40	No	205
HSK 63	27	33	60	48	No	206
HSK 63	27	33	100	48	No	207
HSK 63	27	33	160	48	No	208
HSK 63	32	38	65	58	No	209

Tool holding device	d1 (mm)	L1 (mm)	A (mm)	D (mm)	Coolant supply	23160... Ident. No.
HSK 63	32	38	100	58	No	210
HSK 63	32	38	160	58	No	211
HSK 63	40	41	70	70	No	212
HSK 63	40	41	100	70	No	213
HSK 63	40	41	160	70	No	214
HSK 100	16	27	65	32	No	250
HSK 100	22	31	65	40	No	251
HSK 100	27	33	65	48	No	252
HSK 100	32	38	70	58	No	253
HSK 100	40	41	70	70	No	254

Prod. Gr. 2AC

ORION® shell end mill arbour DIN 6357 (DIN 69893-1)

Blade head holder with transverse groove



Application:

for clamping shell end mills and blade heads

- enlarged composite contact surface
- with coolant outlet on front for blade heads with internal coolant supply
- all functional surfaces machined

- Ident. No. 231-275: with internal cooling

Delivery:

with cutter retaining screw

Execution:

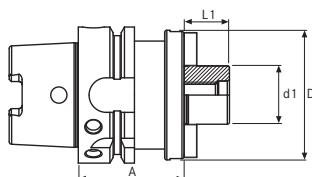
- with Balluff chip hole



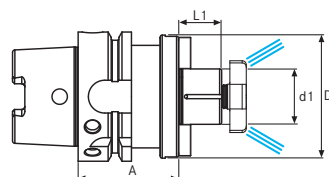
Ident. No. 150-214



Ident. No. 231-275



Ident. No. 150-214



Ident. No. 231-275

Tool holding device	d1 (mm)	L1 (mm)	A (mm)	D (mm)	Coolant supply	23161... Ident. No.	23161... Ident. No.
HSK 63	16	17	45	38	No	150	-
HSK 63	16	17	100	38	No	151	-
HSK 63	16	17	160	38	No	152	-
HSK 63	22	19	50	48	No	153	-
HSK 63	22	19	100	48	No	154	-
HSK 63	22	19	160	48	No	155	-
HSK 63	27	21	55	58	No	156	-
HSK 63	27	21	100	58	No	157	-
HSK 63	27	21	160	58	No	158	-
HSK 63	32	24	60	78	No	159	-
HSK 63	32	24	100	78	No	160	-
HSK 63	32	24	160	78	No	161	-
HSK 63	40	27	65	88	No	162	-
HSK 63	40	27	100	88	No	163	-
HSK 63	40	27	160	88	No	164	-
HSK 100	16	17	55	38	No	201	-
HSK 100	16	17	100	38	No	202	-
HSK 100	16	17	160	38	No	203	-
HSK 100	22	19	55	48	No	204	-
HSK 100	22	19	100	48	No	205	-
HSK 100	22	19	160	48	No	206	-
HSK 100	27	21	55	58	No	207	-
HSK 100	27	21	100	58	No	208	-
HSK 100	27	21	160	58	No	209	-
HSK 100	32	24	60	78	No	210	-

Tool holding device	d1 (mm)	L1 (mm)	A (mm)	D (mm)	Coolant supply	23161... Ident. No.	23161... Ident. No.
HSK 100	32	24	100	78	No	211	-
HSK 100	32	24	160	78	No	212	-
HSK 100	40	27	65	88	No	213	-
HSK 100	40	27	100	88	No	214	-
HSK 63	16	17	45	38	Yes	-	231
HSK 63	16	17	100	38	Yes	-	232
HSK 63	16	17	160	38	Yes	-	233
HSK 63	22	19	50	48	Yes	-	234
HSK 63	22	19	100	48	Yes	-	235
HSK 63	22	19	160	48	Yes	-	236
HSK 63	27	21	55	58	Yes	-	237
HSK 63	27	21	100	58	Yes	-	238
HSK 63	27	21	160	58	Yes	-	239
HSK 63	32	24	60	78	Yes	-	240
HSK 63	32	24	100	78	Yes	-	241
HSK 63	32	24	160	78	Yes	-	242
HSK 63	40	27	65	88	Yes	-	243
HSK 63	40	27	100	88	Yes	-	244
HSK 63	40	27	160	88	Yes	-	245
HSK 100	16	17	55	38	Yes	-	271
HSK 100	22	19	55	48	Yes	-	272
HSK 100	27	21	55	58	Yes	-	273
HSK 100	32	24	60	78	Yes	-	274
HSK 100	40	27	65	88	Yes	-	275

Prod. Gr. 2AC

Compatible coolant transfer pipe no. 23715 050 page 767

Source: Hahn+Kolb Werkzeuge GmbH

Technical data subject to change.

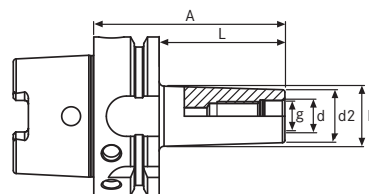
Availability subject to country specific rules and regulations.

ORION® Tool chucks for screw-in mill cutters (DIN 69893-1)



Application:

For holding threaded screw-in milling cutters



Ident. No. 581-584, 586-598

Tool holding device	g	d (mm)	d2 (mm)	D (mm)	A (mm)	L (mm)	23161... Ident. No.	
HSK 63	M6	6.5	10	13	51	25	581	●
HSK 63	M8	8.5	13	15	51	25	582	●
HSK 63	M8	8.5	13	23	76	50	583	●
HSK 63	M8	8.5	13	23	101	75	584	●
HSK 63	M10	10.5	18	20	51	25	585	●
HSK 63	M10	10.5	18	23	76	50	586	●
HSK 63	M10	10.5	18	32	126	100	587	●
HSK 63	M10	10.5	18	36.5	176	150	588	●
HSK 63	M12	12.5	21	24	51	25	589	●
HSK 63	M12	12.5	21	24	76	50	590	●
HSK 63	M12	12.5	21	31	101	75	591	●
HSK 63	M12	12.5	21	33	126	100	592	●
HSK 63	M12	12.5	21	40	176	150	593	●
HSK 63	M16	17	29	29	51	25	594	●
HSK 63	M16	17	29	34	76	50	595	●
HSK 63	M16	17	29	34	101	75	596	●
HSK 63	M16	17	29	36	126	100	597	●
HSK 63	M16	17	29	42.5	176	150	598	●

Prod. Gr. 2AC

Compatible coolant transfer pipe no. 23715 050 page 767

ORION® Collet type ER (DIN 69893-1)



Application:

For clamping tools with straight shanks in ER collet chucks in line with DIN 6499.

Execution:

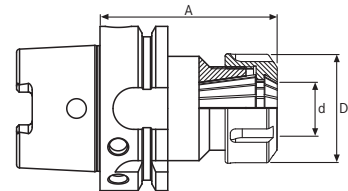
- With Balluff chip hole
- All functional surfaces machined

Delivery:

With clamping nut

Notes:

The previous standard DIN 69871-1 was replaced by ISO 7388-1. Requisite pull studs no. 23690 and collet chucks no. 23320



Tool holding device	d	Min./max. clamping range	D (mm)	A (mm)	23296... Ident. No.	
HSK 63	ER 16	0.5-10 mm	32	100	180	●
HSK 63	ER 16	0.5-10 mm	32	160	181	●
HSK 63	ER 25	2-16 mm	42	100	182	●
HSK 63	ER 25	2-16 mm	42	160	183	●
HSK 63	ER 32	2-20 mm	50	100	184	●
HSK 63	ER 32	2-20 mm	50	160	185	●
HSK 63	ER 40	3-26 mm	63	120	186	●
HSK 63	ER 40	3-26 mm	63	160	187	●
HSK 100	ER 25	2-16 mm	42	100	200	●
HSK 100	ER 25	2-16 mm	42	160	201	●
HSK 100	ER 32	2-20 mm	50	100	202	●
HSK 100	ER 32	2-20 mm	50	160	203	●
HSK 100	ER 40	3-26 mm	63	120	205	●
HSK 100	ER 40	3-26 mm	63	160	206	●

Prod. Gr. 2AC

ORION® ER collet chuck with mini nut slim version (DIN 69893-1) ISO 12164-1 (DIN 69893-1)



Execution:

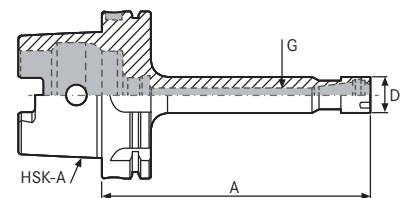
- ER mini nut finely balanced (G2.5 / 25,000 rpm)
- with Balluff chip hole
- all tapers and tolerances are precision-ground

Delivery:

Including high-speed ER mini nut

Notes:

clamping nut type ER Mini ref. no. 23303116-125



Tool holding device	d	Min./max. clamping range	D (mm)	A (mm)	G	23297... Ident. No.	
HSK 63	-	0.5-7 mm	16	100	M6 x 1	051	●
HSK 63	-	0.5-7 mm	16	160	M6 x 1	052	●
HSK 63	ER 16	0.5-10 mm	22	100	M10 x 1	053	●
HSK 63	ER 16	0.5-10 mm	22	160	M10 x 1	054	●
HSK 63	ER 25	1-16 mm	35	100	M18 x 1	055	●
HSK 63	ER 25	1-16 mm	35	160	M18 x 1	056	●

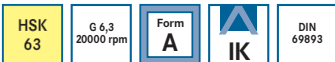
Prod. Gr. 295

Source: Hahn+Kolb Werkzeuge GmbH
Technical data subject to change.

www.iconridge.com

Availability subject to country specific rules and regulations.

ORION® Power chucks (DIN 69893-1)



Application:
for clamping tools with straight shank, widely projecting cutting tools or extensions, and straight shanks in accordance with DIN1835A and B.

Execution:

- optimum concentricity thanks to one-piece basic body at $2.5 \times D \leq 5 \mu\text{m}$
- maximum clamping force and stability due to clamping with roller clamp nut with needle roller bearing
- maintenance-free technology

- suitable for internal coolant supply through the tool up to 80 bar

Advantage:

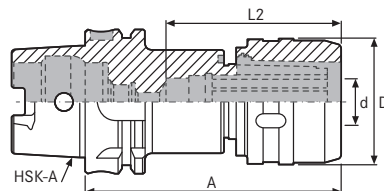
- for high cutting depths and in turn higher material removal rates
- ideal for high feed rates

Delivery:

tool chuck with key

Notes:

flexible use thanks to intermediate bushes, no. 23336



Tool holding device	d (mm)	Min./max. clamping range	A (mm)	L2 (mm)	23762... Ident. No.
HSK 63	20	3-20 mm	105	70	101 ●
HSK 63	32	3-32 mm	130	100	102 ●

Prod. Gr. 295

ORION® Weldon surface chucks (ISO 7388-1)



Application:
For clamping tools with straight shanks and clamping surfaces in line with DIN 1835 B.

Execution:

- All tapers and tolerances are precision-ground
- Cone tolerance AT3
- Strength HRC 57-60

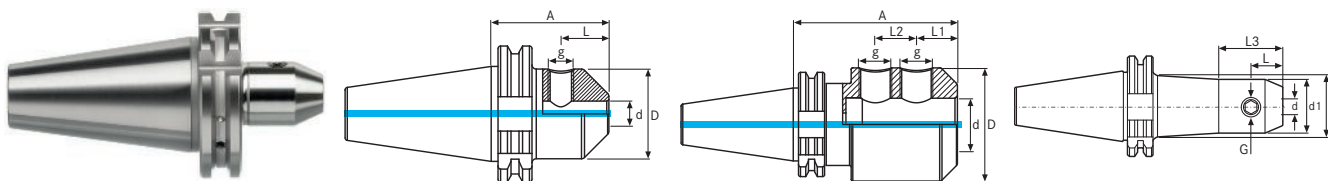
- Core strength 1000-1200 N/mm²
- With Balluff chip hole

Advantage:

- Prevents rotation of tool while maintaining high concentricity

Notes:

Required pull studs, no. 23690



Tool holding device	d (mm)	A (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	D (mm)	d1 (mm)	g / G	23157... Ident. No.	
SK 40	6	50	18	-	-	-	25	-	M6	001	●
SK 40	6	100	18	-	-	40	35	25	M6	002	●
SK 40	6	160	18	-	-	80	35	25	M6	003	●
SK 40	8	50	18	-	-	-	28	-	M8	004	●
SK 40	8	100	18	-	-	40	38	28	M8	005	●
SK 40	8	160	18	-	-	80	38	28	M8	006	●
SK 40	10	50	20	-	-	-	35	-	M10	007	●
SK 40	10	100	20	-	-	40	40	35	M10	008	●
SK 40	10	160	20	-	-	80	40	35	M10	009	●
SK 40	12	50	22.5	-	-	-	42	-	M12	010	●
SK 40	12	100	22.5	-	-	-	42	-	M12	011	●
SK 40	12	160	22.5	-	-	-	42	-	M12	012	●
SK 40	14	50	22.5	-	-	-	44	-	M12	013	●
SK 40	14	100	22.5	-	-	-	44	-	M12	014	●
SK 40	14	160	22.5	-	-	-	44	-	M12	015	●
SK 40	16	63	24	-	-	-	48	-	M14	016	●
SK 40	16	100	24	-	-	-	48	-	M14	017	●
SK 40	16	160	24	-	-	-	48	-	M14	018	●
SK 40	18	63	24	-	-	-	50	-	M14	019	●
SK 40	18	100	24	-	-	-	50	-	M14	020	●
SK 40	18	160	24	-	-	-	50	-	M14	021	●
SK 40	20	63	25	-	-	-	52	-	M16	022	●
SK 40	20	100	25	-	-	-	52	-	M16	023	●
SK 40	20	160	25	-	-	-	52	-	M16	024	●
SK 40	25	100	-	24	25	-	65	-	M18 x 2	025	●
SK 40	25	160	-	24	25	-	65	-	M18 x 2	026	●
SK 40	32	100	-	24	28	-	72	-	M20 x 2	027	●
SK 40	32	160	-	24	28	-	72	-	M20 x 2	028	●
SK 40	40	115	-	30	32	-	80	-	M20 x 2	029	●
SK 40	40	160	-	30	32	-	80	-	M20 x 2	030	●
SK 50	6	63	18	-	-	-	25	-	M6	050	●
SK 50	6	115	18	-	-	40	35	25	M6	051	●
SK 50	6	115	18	-	-	80	35	25	M6	052	●
SK 50	8	63	18	-	-	-	28	-	M8	053	●
SK 50	8	100	18	-	-	80	38	28	M8	054	●
SK 50	8	160	18	-	-	-	38	28	M8	055	●
SK 50	10	63	20	-	-	-	35	-	M10	056	●
SK 50	10	100	20	-	-	40	42	35	M10	057	●
SK 50	10	160	20	-	-	80	42	35	M10	058	●
SK 50	12	63	22.5	-	-	-	42	-	M12	059	●
SK 50	12	100	22.5	-	-	40	48	42	M12	060	●
SK 50	12	160	22.5	-	-	80	48	42	M12	061	●
SK 50	14	63	22.5	-	-	-	44	-	M12	062	●
SK 50	14	100	22.5	-	-	40	50	44	M12	063	●
SK 50	14	160	22.5	-	-	80	50	44	M12	064	●
SK 50	16	63	24	-	-	-	48	-	M14	065	●
SK 50	16	100	24	-	-	40	54	48	M14	066	●
SK 50	16	160	24	-	-	80	54	48	M14	067	●
SK 50	18	63	24	-	-	-	50	-	M14	068	●
SK 50	18	100	24	-	-	40	56	50	M14	069	●
SK 50	18	160	24	-	-	80	56	50	M14	070	●
SK 50	20	63	25	-	-	-	52	-	M16	071	●
SK 50	20	100	25	-	-	40	59	52	M16	072	●
SK 50	20	160	25	-	-	80	59	52	M16	073	●
SK 50	25	80	-	24	25	-	65	-	M18 x 2	074	●
SK 50	25	100	-	24	25	-	65	-	M18 x 2	075	●
SK 50	32	100	-	24	28	-	72	-	M20 x 2	077	●
SK 50	32	160	-	24	28	-	72	-	M20 x 2	078	●
SK 50	25	160	-	24	25	-	65	-	M18 x 2	076	●
SK 50	40	120	-	30	32	-	80	-	M20 x 2	079	●
SK 50	40	160	-	30	32	-	80	-	M20 x 2	080	●
SK 50	50	120	-	35	35	-	100	-	M24 x 2	081	●

Prod. Gr. 2AC

ORION® Surface chuck (Weldon) with coolant bores (ISO 7388-1)

KKB= resealable cooling duct holes



Application:
for clamping tools with straight shanks and clamping surfaces in line with DIN 1835 B.

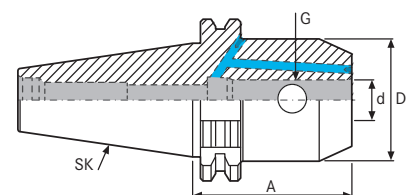
- Execution:**
- all tapers and tolerances are precision-ground
 - cone tolerance AT3
 - strength HRC 57-60
 - core strength 1000-1200 N/mm²

- with Balluff chip hole
- KKB= resealable coolant bores

Advantage:

- prevents rotation of tool while maintaining high concentricity

Notes:
requisite pull studs, no. 23690



Tool clamp \ Tool chucks ISO 7388-1 SK 40/50

Tool holding device	d (mm)	A (mm)	D (mm)	g / G	23157... Ident. No.
SK 40	6	50	25	M6	301
SK 40	6	100	25	M6	302
SK 40	6	160	25	M6	303
SK 40	8	50	28	M8	304
SK 40	8	100	28	M8	305
SK 40	8	160	28	M8	306
SK 40	10	50	35	M10	307
SK 40	10	100	35	M10	308
SK 40	10	160	35	M10	309
SK 40	12	50	42	M12	310
SK 40	12	100	42	M12	311
SK 40	12	160	42	M12	312
SK 40	14	50	44	M12	313
SK 40	14	100	44	M12	314
SK 40	14	160	44	M12	315
SK 40	16	63	48	M14	316
SK 40	16	100	48	M14	317
SK 40	16	160	48	M14	318
SK 40	18	63	50	M14	319
SK 40	18	100	50	M14	320
SK 40	18	160	50	M14	321
SK 40	20	63	52	M16	322
SK 40	20	100	52	M16	323
SK 40	20	160	52	M16	324
SK 40	25	100	65	M18 x 2	325
SK 40	25	160	65	M18 x 2	326
SK 40	32	100	72	M20 x 2	327
SK 40	32	160	72	M20 x 2	328
SK 40	40	115	80	M20 x 2	329
SK 40	40	160	80	M20 x 2	330

Prod. Gr. 295

ORION® Combination shell end mill arbors (DIN 6358) (ISO 7388-1)



Application:

For holding shell end mills and single angle milling cutters with longitudinal groove in line with DIN 842.

Execution:

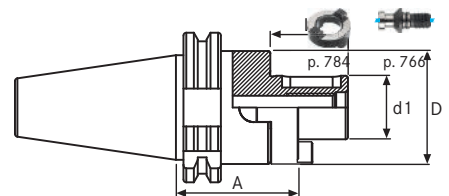
- all tapers and tolerances are precision-ground
- concentricity < 0.005 mm
- with hole for Balluff chip



Ident. No. 001-015, 061



Ident. No. 050-060, 062-064



Delivery:
With cutter retaining screw, key and driving ring.

Notes:

The previous standard DIN 69871-1 was replaced by ISO 7388-1. Required pull stud no. 23690

If desired with combined shell end mill arbors with ICS, the cutter retaining screws must be ordered separately with IC DIN 6367, ref. no. 23185130-180

Tool holding device	d1 (mm)	L1 (mm)	A (mm)	D (mm)	Form	23160... Ident. No.
SK 40	16	27	55	32	AD	001
SK 40	16	27	100	32	AD	002
SK 40	16	27	160	32	AD	003
SK 40	22	31	55	40	AD	004
SK 40	22	31	100	40	AD	005
SK 40	22	31	160	40	AD	006
SK 40	27	33	55	48	AD	007
SK 40	27	33	100	48	AD	008
SK 40	27	33	160	48	AD	009
SK 40	32	38	60	58	AD	010
SK 40	32	38	100	58	AD	011
SK 40	32	38	160	58	AD	012
SK 40	40	41	60	70	AD	013
SK 40	40	41	100	70	AD	014
SK 40	40	41	160	70	AD	015
SK 50	16	27	55	32	AD	050
SK 50	16	27	100	32	AD	051
SK 50	16	27	160	32	AD	052
SK 50	22	31	55	40	AD	053
SK 50	22	31	100	40	AD	054
SK 50	22	31	160	40	AD	055
SK 50	27	33	55	48	AD	056
SK 50	27	33	100	48	AD	057
SK 50	27	33	160	48	AD	058
SK 50	32	38	55	58	AD	059
SK 50	32	38	100	58	AD	060
SK 50	32	38	160	58	AD	061
SK 50	40	41	55	70	AD	062
SK 50	40	41	100	70	AD	063
SK 50	40	41	160	70	AD	064

Prod. Gr. 2AC

Source: Hahn+Kolb Werkzeuge GmbH

Technical data subject to change.

Availability subject to country specific rules and regulations.

www.iconridge.com

ORION® shell end mill arbour (DIN 6357) (ISO 7388-1)

blade head holder



Application:
for clamping shell end mills and blade heads

Execution:
▪ with Balluff chip hole

- enlarged composite contact surface
- With coolant outlet on front for blade heads with inner coolant supply
- all tapers and tolerances are precision-ground

Delivery:
with cutter retaining screw

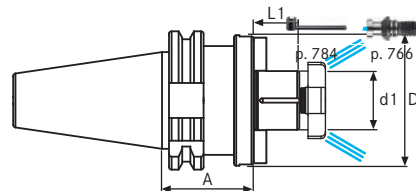
Notes:
The previous standard DIN 69871-1 was replaced by ISO 7388-1.



Ident. No. 001-015



Ident. No. 050-064



Tool holding device	d1 (mm)	L1 (mm)	D (mm)	A (mm)	23161... Ident. No.	
SK 40	16	17	38	45	001	●
SK 40	16	17	38	100	002	●
SK 40	16	17	38	160	003	●
SK 40	22	19	48	45	004	●
SK 40	22	19	48	100	005	●
SK 40	22	19	48	160	006	●
SK 40	27	21	58	50	007	●
SK 40	27	21	58	100	008	●
SK 40	27	21	58	160	009	●
SK 40	32	24	78	55	010	●
SK 40	32	24	78	100	011	●
SK 40	32	24	78	160	012	●
SK 40	40	27	88	55	013	●
SK 40	40	27	88	100	014	●
SK 40	40	27	88	160	015	●

Tool holding device	d1 (mm)	L1 (mm)	D (mm)	A (mm)	23161... Ident. No.	
SK 50	16	17	38	45	050	●
SK 50	16	17	38	100	051	●
SK 50	16	17	38	160	052	●
SK 50	22	19	48	45	053	●
SK 50	22	19	48	100	054	●
SK 50	22	19	48	160	055	●
SK 50	27	21	58	45	056	●
SK 50	27	21	58	100	057	●
SK 50	27	21	58	160	058	●
SK 50	32	24	78	50	059	●
SK 50	32	24	78	100	060	●
SK 50	32	24	78	160	061	●
SK 50	40	27	88	55	062	●
SK 50	40	27	88	100	063	●
SK 50	40	27	88	160	064	●

Prod. Gr. 2AC

ORION® Tool chucks for screw-in milling cutters (ISO 7388-1)



Application:
For holding threaded screw-in milling cutters

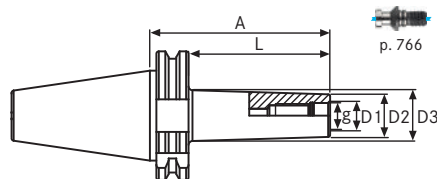
Notes:
Required pull studs, no. 23690. The previous standard DIN 69871-1 was replaced by ISO 7388-1.



Ident. No. 501-521



Ident. No. 551-562



Tool holding device	g	D1 (mm)	D2 (mm)	D3 (mm)	A (mm)	L (mm)	23161... Ident. No.	
SK 40	M6	6.5	10	13	44	25	501	●
SK 40	M6	6.5	10	20	69	50	502	●
SK 40	M6	6.5	10	23	94	75	503	●
SK 40	M8	8.5	13	15	44	25	504	●
SK 40	M8	8.5	13	23	69	50	505	●
SK 40	M8	8.5	13	23	94	75	506	●
SK 40	M8	8.5	13	25	119	100	507	●
SK 40	M10	10.5	18	20	44	25	508	●
SK 40	M10	10.5	18	23	69	50	509	●
SK 40	M10	10.5	18	28	94	75	510	●
SK 40	M10	10.5	18	32	119	100	511	●
SK 40	M12	12.5	21	24	44	25	512	●
SK 40	M12	12.5	21	24	69	50	513	●
SK 40	M12	12.5	21	31	94	75	514	●
SK 40	M12	12.5	21	33	119	100	515	●
SK 40	M12	12.5	21	36	144	125	516	●
SK 40	M16	17	29	29	44	25	517	●
SK 40	M16	17	29	34	69	50	518	●
SK 40	M16	17	29	34	94	75	519	●
SK 40	M16	17	29	36	119	100	520	●
SK 40	M16	17	29	40	144	125	521	●

Tool clamp \ Tool chucks ISO 7388-1 SK 40/50

Tool holding device	g	D1 (mm)	D2 (mm)	D3 (mm)	A (mm)	L (mm)	23161... Ident. No.	
SK 50	M8	8.5	13	23	69	50	551	●
SK 50	M8	8.5	13	25	119	100	552	●
SK 50	M8	8.5	13	30	169	150	553	●
SK 50	M10	10.5	18	23	69	50	554	●
SK 50	M10	10.5	18	32	119	100	555	●
SK 50	M10	10.5	18	37	169	150	556	●
SK 50	M12	12.5	21	24	69	50	557	●
SK 50	M12	12.5	21	33	119	100	558	●
SK 50	M12	12.5	21	40	169	150	559	●
SK 50	M16	17	29	34	69	50	560	●
SK 50	M16	17	29	36	119	100	561	●
SK 50	M16	17	29	43	169	150	562	●

Prod. Gr. 2AC

Compatible pull studs no. 23690 130-150

ORION® Short drill chuck (ISO 7388-1) Self-clamping



Application:

For drilling and centring.

Execution:

- Precision design
- Clamping force increases automatically and proportionally to the torque

Advantage:

- Quick clamping via clamping sleeve, with two clamping surfaces for doubling the clamping force with a spanner

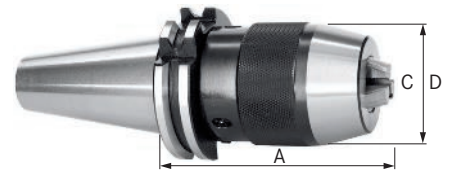
- In the event of a sudden spindle stop, the cutting tool cannot work loose

Delivery:

With special key

Notes:

The previous standard DIN 69871-1 was replaced by ISO 7388-1.



Tool holding device	Min./max. clamping width	A (mm)	D (mm)	Coolant supply	23050... Ident. No.	
SK 40	1-13 mm	86	50	No	740	●
SK 40	2.5-16 mm	110	57	No	745	●
SK 50	3-16 mm	90	57	No	750	●

Prod. Gr. 295

Compatible pull studs without internal cooling no. 23692 130-150

ORION® Collet type ER (ISO 7388-1)

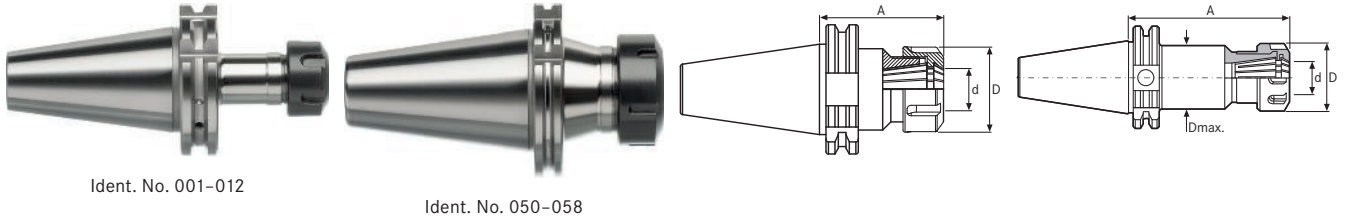


Application:
For clamping tools with straight shanks in ER collet chucks in line with DIN 6499.

Delivery:
With clamping nut

- Execution:**
- With Balluff chip hole
 - All tapers and tolerances are precision-ground

Notes:
The previous standard DIN 69871-1 was replaced by ISO 7388-1. Requisite pull studs no. 23690 and collet chucks no. 23320



Tool holding device	Collet type	Min./max. clamping range	A (mm)	D (mm)	D max. (mm)	23296... Ident. No.
SK 40	ER 16	0.5-10 mm	70	32	-	001
SK 40	ER 16	0.5-10 mm	100	32	28	002
SK 40	ER 16	0.5-10 mm	160	32	28	003
SK 40	ER 25	2-16 mm	70	42	-	004
SK 40	ER 25	2-16 mm	100	42	40	005
SK 40	ER 25	2-16 mm	160	42	40	006
SK 40	ER 32	2-20 mm	70	50	-	007
SK 40	ER 32	2-20 mm	100	50	45	008
SK 40	ER 32	2-20 mm	160	50	45	009
SK 40	ER 40	3-26 mm	70	63	-	010
SK 40	ER 40	3-26 mm	100	63	48	011
SK 40	ER 40	3-26 mm	160	63	48	012
SK 50	ER 25	2-16 mm	70	42	-	050
SK 50	ER 25	2-16 mm	100	42	40	051
SK 50	ER 25	2-16 mm	160	42	40	052
SK 50	ER 32	2-20 mm	70	50	-	053
SK 50	ER 32	2-20 mm	100	50	45	054
SK 50	ER 32	2-20 mm	160	50	45	055
SK 50	ER 40	3-26 mm	80	63	-	056
SK 50	ER 40	3-26 mm	100	63	60	057
SK 50	ER 40	3-26 mm	160	63	60	058

Prod. Gr. 2AC
Compatible pull studs no. 23690 130-150
Compatible ER-type collet chucks no. 23322 011-426 and no. 23322 501-636

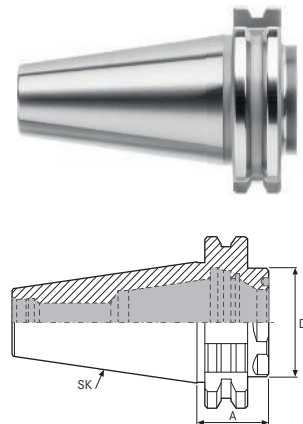
ORION® ER collet chuck ultra-short (ISO 7388-1)



Application:
for clamping tools with straight shanks in ER collet chucks in line with DIN 6499.

Notes:
the previous standard DIN 69871-1 was replaced by ISO 7388-1. required pull stud no. 23690 and collet chucks no. 23320
matching key ref. no. 52110050

- Execution:**
- with Balluff chip hole
 - all tapers and tolerances are precision-ground



Tool holding device	Collet type	Min./max. clamping range	A (mm)	D (mm)	23296... Ident. No.
SK 40	ER 32	2-20 mm	24	40	060
SK 50	ER 32	2-20 mm	24	40	061

ORION® ER collet chuck, mini slim version (ISO 7388-1)



Execution:

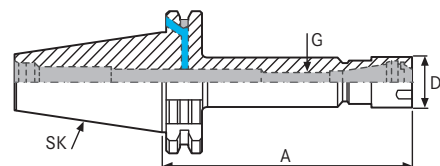
- with Balluff chip hole
- all tapers and tolerances are precision-ground
- all tapers and tolerances are precision-ground

Delivery:

including high-speed ER mini nut

Notes:

ER Mini clamping nut, ref. no. 23303116-125



Tool holding device	Collet type	Min./max. clamping range	A (mm)	D (mm)	G	23297... Ident. No.
SK 40	-	0.5-7 mm	50	16	M6 x 1	001 ●
SK 40	-	0.5-7 mm	100	16	M6 x 1	002 ●
SK 40	-	0.5-7 mm	160	16	M6 x 1	003 ●
SK 40	ER 16	0.5-10 mm	70	22	M10 x 1	004 ●
SK 40	ER 16	0.5-10 mm	100	22	M10 x 1	005 ●
SK 40	ER 16	0.5-10 mm	160	22	M10 x 1	006 ●
SK 40	ER 25	1-16 mm	70	35	M18 x 1	007 ●
SK 40	ER 25	1-16 mm	100	35	M18 x 1	008 ●
SK 40	ER 25	1-16 mm	160	35	M18 x 1	009 ●

Prod. Gr. 295

ORION® Power chucks (ISO 7388-1)



Application:

for clamping tools with straight shank, widely projecting cutting tools or extensions, and straight shanks in accordance with DIN1835A and B.

Execution:

- optimum concentricity thanks to one-piece basic body at $2.5 \times D \leq 5 \mu\text{m}$
- maximum clamping force and stability due to clamping with roller clamp nut with needle roller bearing
- maintenance-free technology
- suitable for internal coolant supply through the tool up to 80 bar

Advantage:

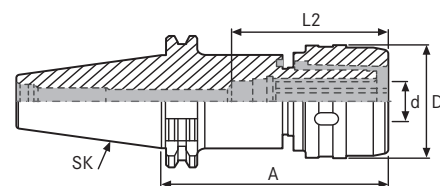
- for high cutting depths and in turn higher material removal rates
- ideal for high feed rates

Delivery:

tool chuck with key

Notes:

old standard DIN 69871-1 was replaced by ISO 7388-1. Flexible use through intermediate bushings no. 23336



Tool holding device	d (mm)	Min./max. clamping range	A (mm)	D (mm)	L2 (mm)	23362... Ident. No.
SK 40	20	3-20 mm	105	54	70	101 ●
SK 40	32	3-32 mm	105	72	100	102 ●
SK 50	20	3-20 mm	105	54	70	103 ●
SK 50	32	3-32 mm	105	72	100	104 ●

Prod. Gr. 295

ORION® Weldon surface chucks (ISO 7388-2)



Application:

For clamping tools with straight shanks and clamping surfaces in line with DIN 1835 B.

Execution:

- All tapers and tolerances are precision-ground
- Cone tolerance AT3
- Strength HRC 57-60

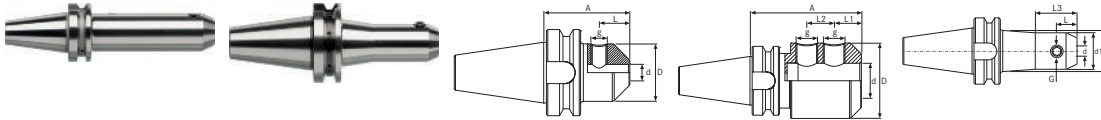
- Core strength 1000-1200 N/mm²
- With Balluff chip hole

Advantage:

- Prevents rotation of tool while maintaining high concentricity

Notes:

Required pull studs, no. 23690. The previous standard JIS B 6339 MAS BT was replaced by ISO 7388-2.



Tool holding device	d (mm)	A (mm)	D (mm)	d1 (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	g / G	23157... Ident. No.	
BT 40	6	50	25	-	18	-	-	-	M6	100	●
BT 40	6	100	35	25	18	-	-	40	M6	101	●
BT 40	6	160	35	25	18	-	-	80	M6	102	●
BT 40	8	50	28	-	18	-	-	-	M8	103	●
BT 40	8	100	38	28	18	-	-	40	M8	104	●
BT 40	8	160	38	28	18	-	-	80	M8	105	●
BT 40	10	63	35	-	20	-	-	-	M10	106	●
BT 40	10	100	40	35	20	-	-	40	M10	107	●
BT 40	10	160	40	35	20	-	-	80	M10	108	●
BT 40	12	63	42	-	22.5	-	-	-	M12	109	●
BT 40	12	100	42	-	22.5	-	-	-	M12	110	●
BT 40	12	160	42	-	22.5	-	-	-	M12	111	●
BT 40	14	63	44	-	22.5	-	-	-	M12	112	●
BT 40	14	100	44	-	22.5	-	-	-	M12	113	●
BT 40	14	160	44	-	22.5	-	-	-	M12	114	●
BT 40	16	63	48	-	24	-	-	-	M14	115	●
BT 40	16	100	48	-	24	-	-	-	M14	116	●
BT 40	16	160	48	-	24	-	-	-	M14	117	●
BT 40	18	63	50	-	24	-	-	-	M14	118	●
BT 40	18	100	50	-	24	-	-	-	M14	119	●
BT 40	18	160	50	-	24	-	-	-	M14	120	●
BT 40	20	63	52	-	25	-	-	-	M16	121	●
BT 40	20	100	52	-	25	-	-	-	M16	122	●
BT 40	20	160	52	-	25	-	-	-	M16	123	●
BT 40	25	90	65	-	-	24	25	-	M18 x 2	124	●
BT 40	25	160	65	-	-	24	25	-	M18 x 2	125	●
BT 40	32	100	72	-	-	24	28	-	M20 x 2	126	●
BT 40	32	160	72	-	-	24	28	-	M20 x 2	127	●
BT 40	40	100	80	-	-	30	32	-	M20 x 2	128	●
BT 40	40	160	80	-	-	30	32	-	M20 x 2	129	●
BT 50	6	63	25	-	18	-	-	-	M6 x 1	150	●
BT 50	6	100	35	25	18	-	-	35	M6 x 1	151	●
BT 50	6	160	35	25	18	-	-	80	M6 x 1	152	●
BT 50	8	63	28	-	18	-	-	-	M8	153	●

Tool clamp \ Tool chucks ISO 7388-2 BT40/50

Tool holding device	d (mm)	A (mm)	D (mm)	d1 (mm)	L (mm)	L1 (mm)	L2 (mm)	L3 (mm)	g / G	23157... Ident. No.	
BT 50	8	100	38	28	18	-	-	35	M8	154	●
BT 50	8	160	38	28	18	-	-	80	M8	155	●
BT 50	10	63	35	-	20	-	-	-	M10	156	●
BT 50	10	100	42	35	20	-	-	35	M10	157	●
BT 50	10	160	42	35	20	-	-	80	M10	158	●
BT 50	12	63	42	-	22.5	-	-	-	M12	159	●
BT 50	12	100	48	42	22.5	-	-	35	M12	160	●
BT 50	12	160	48	42	22.5	-	-	80	M12	161	●
BT 50	14	63	44	-	22.5	-	-	-	M12	162	●
BT 50	14	100	50	44	22.5	-	-	35	M12	163	●
BT 50	14	160	44	44	22.5	-	-	80	M12	164	●
BT 50	16	63	48	-	24	-	-	-	M14	165	●
BT 50	16	100	54	48	24	-	-	35	M14	166	●
BT 50	16	160	54	48	24	-	-	80	M14	167	●
BT 50	18	63	50	-	24	-	-	-	M14	168	●
BT 50	18	100	62	50	24	-	-	35	M14	169	●
BT 50	18	160	62	50	24	-	-	80	M14	170	●
BT 50	20	63	-	-	25	-	-	-	M16	171	●
BT 50	20	100	66	52	25	-	-	35	M16	172	●
BT 50	20	160	69	52	25	-	-	80	M16	173	●
BT 50	25	100	65	-	-	24	25	-	M18 x 2	174	●
BT 50	25	160	65	-	-	24	25	-	M18 x 2	175	●
BT 50	32	105	72	-	-	24	28	-	M20 x 2	176	●
BT 50	32	160	72	-	-	24	28	-	M20 x 2	177	●
BT 50	40	115	80	-	-	30	32	-	M20 x 2	178	●
BT 50	40	160	80	-	-	30	32	-	M20 x 2	179	●
BT 50	50	125	100	-	-	35	35	-	M24 x 2	180	●

Prod. Gr. 2AC
Compatible pull studs no. 23690 240-250

ORION® Surface chuck (Weldon) with coolant bores (ISO 7388-2) KKB= resealable cooling duct holes



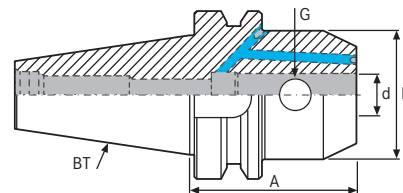
Application:
for clamping tools with straight shank and clamping surface in accordance with DIN 1835 B.

- Execution:**
- all tapers and tolerances are precision-ground
 - cone tolerance AT3
 - strength HRC 57-60
 - core strength 1000-1200 N/mm²

- with Balluff chip hole
- KKB= resealable coolant bores

Advantage:
prevents rotation of tool while maintaining high concentricity

Notes:
required pull studs, no. 23690. the previous standard JIS B 6339 MAS BT was replaced by ISO 7388-2.



Tool holding device	d (mm)	A (mm)	D (mm)	g / G	23157... Ident. No.	
BT 40	6	50	25	M6	401	●
BT 40	6	100	25	M6	402	●
BT 40	6	160	25	M6	403	●
BT 40	8	50	28	M8	404	●
BT 40	8	100	28	M8	405	●
BT 40	8	160	28	M8	406	●
BT 40	10	63	35	M10	407	●
BT 40	10	100	35	M10	408	●
BT 40	10	160	35	M10	409	●
BT 40	12	63	42	M12	410	●
BT 40	12	100	42	M12	411	●
BT 40	12	160	42	M12	412	●
BT 40	14	63	44	M12	413	●
BT 40	14	100	44	M12	414	●
BT 40	14	160	44	M12	415	●
BT 40	16	63	48	M14	416	●
BT 40	16	100	48	M14	417	●
BT 40	16	160	48	M14	418	●
BT 40	18	63	50	M14	419	●
BT 40	18	100	50	M14	420	●
BT 40	18	160	50	M14	421	●
BT 40	20	63	52	M16	422	●
BT 40	20	100	52	M16	423	●
BT 40	20	160	52	M16	424	●
BT 40	25	90	65	M18 x 2	425	●
BT 40	25	160	65	M18 x 2	426	●
BT 40	32	100	72	M20 x 2	427	●
BT 40	32	160	72	M20 x 2	428	●
BT 40	40	105	80	M20 x 2	429	●
BT 40	40	160	80	M20 x 2	430	●

Prod. Gr. 295

Source: Hahn+Kolb Werkzeuge GmbH
Technical data subject to change.
Availability subject to country specific rules and regulations.

www.iconridge.com

ORION® Combined shell end mill arbors (ISO 7388-2)



Application:

For holding shell end mills and single angle milling cutters with longitudinal groove in line with DIN 842.

Execution:

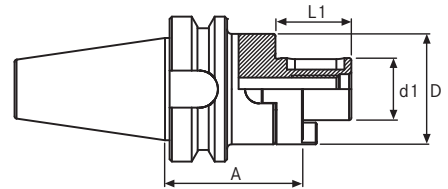
- All tapers and tolerances are precision-ground
- Concentricity < 0.005 mm
- With hole for Balluff chip
- Required pull studs, no. 23690

Delivery:

With cutter retaining screw, key, and driving ring

Notes:

The previous standard JIS B 6339 MAS BT was replaced by ISO 7388-2.
If desired with combined shell end mill arbors with ICS, the cutter retaining screws must be ordered separately with IC DIN 6367, ref. no. 23185130-180



Tool holding device	d1 (mm)	L1 (mm)	A (mm)	D (mm)	23160... Ident. No.	
BT 40	16	27	55	32	100	●
BT 40	16	27	100	32	101	●
BT 40	16	27	160	32	102	●
BT 40	22	31	55	40	103	●
BT 40	22	31	100	40	104	●
BT 40	22	31	160	40	105	●
BT 40	27	33	55	48	106	●
BT 40	27	33	100	48	107	●
BT 40	27	33	160	48	108	●
BT 40	32	38	60	58	109	●
BT 40	32	38	100	58	110	●
BT 40	32	38	160	58	111	●
BT 40	40	41	60	70	112	●
BT 40	40	41	100	70	113	●
BT 40	40	41	160	70	114	●

Prod. Gr. 2AC

Compatible pull studs no. 23690 240-250

Spacing collar for mill arbours no. 23135 010-345 and no. 23140 005-315

ORION® shell end mill arbour DIN 6357 (ISO 7388-2) blade head holder



Application:

For clamping shell end mills and blade heads

Execution:

- With Balluff chip hole
- Enlarged composite contact surface
- With coolant outlet on front for blade heads with inner coolant supply

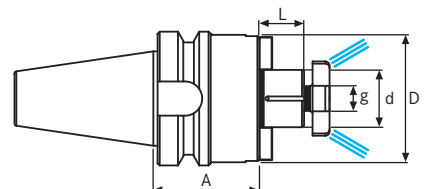
- All tapers and tolerances are precision-ground

Delivery:

Milling cutter retaining screw

Notes:

The previous standard JIS B 6339 MAS BT was replaced by ISO 7388-2.



Tool holding device	d1 (mm)	L1 (mm)	A (mm)	D (mm)	23161... Ident. No.	
BT 40	16	17	45	38	100	●
BT 40	16	17	100	38	101	●
BT 40	16	17	160	38	102	●
BT 40	22	19	45	48	103	●
BT 40	22	19	100	48	104	●
BT 40	22	19	160	48	105	●
BT 40	27	21	45	58	106	●
BT 40	27	21	100	58	107	●
BT 40	27	21	160	58	108	●
BT 40	32	24	50	78	109	●
BT 40	32	24	100	78	110	●
BT 40	32	24	160	78	111	●
BT 40	40	27	55	88	112	●
BT 40	40	27	100	88	113	●
BT 40	40	27	160	88	114	●

Prod. Gr. 2AC

ORION® Collet type ER (ISO 7388-2)

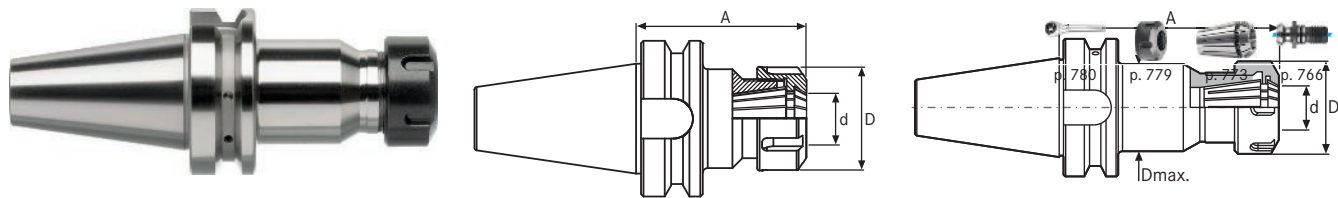


Application:
For clamping tools with straight shanks in ER collet chucks in line with DIN 6499.

Delivery:
With clamping nut

- Execution:**
- With Balluff chip hole
 - All functional surfaces precision-ground

Notes:
The previous standard JIS B 6339 MAS BT was replaced by ISO 7388-2. Requisite pull studs no. 23690 and collet chucks no. 23320



Tool holding device	Collet type	min./max. d	A (mm)	D (mm)	D max. (mm)	23296... Ident. No.
BT 40	ER 16	0.5-10 mm	70	32	28	100 ●
BT 40	ER 16	0.5-10 mm	100	32	28	101 ●
BT 40	ER 16	0.5-10 mm	160	32	28	102 ●
BT 40	ER 25	2-16 mm	70	42	-	103 ●
BT 40	ER 25	2-16 mm	100	42	40	104 ●
BT 40	ER 25	2-16 mm	160	42	40	105 ●
BT 40	ER 32	2-20 mm	70	50	-	106 ●
BT 40	ER 32	2-20 mm	100	50	48	107 ●
BT 40	ER 32	2-20 mm	160	50	48	108 ●
BT 40	ER 40	3-26 mm	70	63	-	109 ●
BT 40	ER 40	3-26 mm	100	63	50	110 ●
BT 40	ER 40	3-26 mm	160	63	50	111 ●
BT 50	ER 25	2-16 mm	80	42	-	150 ●
BT 50	ER 25	2-16 mm	100	42	40	151 ●
BT 50	ER 25	2-16 mm	160	42	40	152 ●
BT 50	ER 32	2-20 mm	80	50	-	153 ●
BT 50	ER 32	2-20 mm	100	50	45	154 ●
BT 50	ER 32	2-20 mm	160	50	45	155 ●
BT 50	ER 40	3-26 mm	80	63	-	156 ●
BT 50	ER 40	3-26 mm	100	63	60	157 ●
BT 50	ER 40	3-26 mm	160	63	60	158 ●

Prod. Gr. 2AC

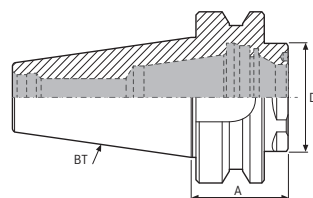
ORION® ER collet chuck ultra-short (ISO 7388-2)



Application:
for clamping tools with straight shanks in ER collet chucks in line with DIN 6499.

Notes:
the previous standard JIS B 6339 MAS BT was replaced by ISO 7388-2 required pull stud no. 23690 and collet chucks no. 23320 matching key ref. no. 52110050

- Execution:**
- with Balluff chip hole
 - all tapers and tolerances are precision-ground



Tool holding device	Collet type	min./max. d	A (mm)	D (mm)	23296... Ident. No.
BT 40	ER 32	2-20 mm	32	40	170 ●
BT 50	ER 32	2-20 mm	43	40	171 ●

Prod. Gr. 295

ORION® ER collet chuck, mini slim version (ISO 7388-2)

ISO 7388-2



Execution:

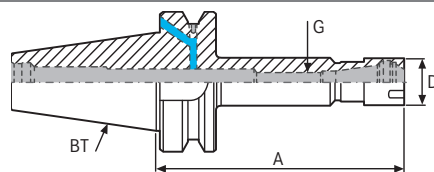
- ER mini nut finely balanced (G2.5 / 25,000 rpm)
- with Balluff chip hole
- all tapers and tolerances are precision-ground

Delivery:

including high-speed ER mini nut

Notes:

ER mini type clamping nut ref. no. 23303116-125 former standard JIS B 6339 MAS BT has been replaced by ISO 7388-2.



Tool holding device	Collet type	min./max. d	A (mm)	D (mm)	G	23297... Ident. No.
BT 40	-	0.5-7 mm	70	16	M6 x 1	021 ●
BT 40	-	0.5-7 mm	100	16	M6 x 1	022 ●
BT 40	-	0.5-7 mm	160	16	M6 x 1	023 ●
BT 40	ER 16	0.5-10 mm	70	22	M10 x 1	024 ●
BT 40	ER 16	0.5-10 mm	100	22	M10 x 1	025 ●
BT 40	ER 16	0.5-10 mm	120	22	M10 x 1	026 ●
BT 40	ER 16	0.5-10 mm	160	22	M10 x 1	027 ●
BT 40	ER 20	1-13 mm	120	28	M10 x 1	028 ●
BT 40	ER 20	1-13 mm	160	28	M10 x 1	029 ●
BT 40	ER 25	1-16 mm	70	35	M18 x 1	030 ●
BT 40	ER 25	1-16 mm	100	35	M18 x 1	031 ●
BT 40	ER 25	1-16 mm	120	35	M18 x 1	032 ●
BT 40	ER 25	1-16 mm	160	35	M18 x 1	033 ●

Prod. Gr. 295

ORION® Power chucks (ISO 7388-2)



Application:

for clamping tools with straight shank, widely projecting cutting tools or extensions, and straight shanks in accordance with DIN1835A and B.

Execution:

- optimum concentricity thanks to one-piece basic body at $2.5 \times D \leq 5 \mu\text{m}$
- maximum clamping force and stability due to clamping with roller clamp nut with needle roller bearing
- maintenance-free technology
- suitable for internal coolant supply through the tool up to 80 bar

- flexible use thanks to intermediate bushes, no. 23336

Advantage:

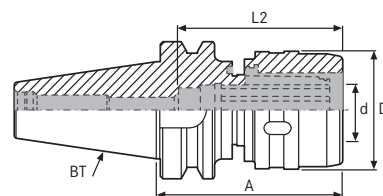
- for high cutting depths and in turn higher material removal rates
- ideal for high feed rates

Delivery:

tool chuck with key

Notes:

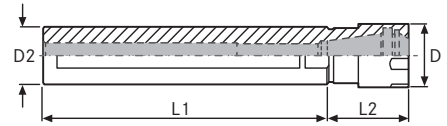
the previous standard JIS B 6339 MAS BT was replaced by ISO 7388-2.



Tool holding device	d (mm)	Min./max. clamping Ø	A (mm)	D (mm)	L2 (mm)	23362... Ident. No.
BT 40	20	3-20 mm	80	54	70	111 ●
BT 40	32	3-32 mm	90	70	100	112 ●
BT 50	20	3-20 mm	105	54	70	113 ●
BT 50	32	3-32 mm	105	70	100	114 ●

Prod. Gr. 295

ORION® ER collet chuck Mini extensions
with straight shank



Collet type	-	-	ER 16	ER 16	-	-	ER 16	ER 16	
Min./max. clamping range	0.5-7 mm	0.5-7 mm	0.5-10 mm	0.5-10 mm	0.5-7 mm	0.5-7 mm	0.5-10 mm	0.5-10 mm	
D2 (mm)	16	16	16	16	20	20	20	20	
L1 (mm)	100	160	60	160	50	100	60	100	
D (mm)	16	16	22	22	16	16	22	22	
L2 (mm)	22	22	37	37	22	22	30	30	
Clamping nut type	-	-	ER 16 MINI	ER 16 MINI	-	-	ER 16 MINI	ER 16 MINI	
23297...	Ident. No.	081	082	083	084	085	086	087	088

Collet type	ER 16	ER 16	ER 20	ER 20	ER 20	ER 20	ER 20	ER 25	
Min./max. clamping range	0.5-10 mm	0.5-10 mm	1-13 mm	1-13 mm	1-13 mm	1-13 mm	1-13 mm	1-16 mm	
D2 (mm)	20	20	20	20	20	20	20	20	
L1 (mm)	130	160	60	100	130	160	200	100	
D (mm)	22	22	28	28	28	28	28	35	
L2 (mm)	30	30	37	37	37	37	37	46	
Clamping nut type	ER 16 MINI	ER 16 MINI	ER 20 MINI	ER 20 MINI	ER 20 MINI	ER 20 MINI	ER 20 MINI	ER 25 MINI	
23297...	Ident. No.	089	090	091	092	093	094	095	096

Collet type	ER 25	
Min./max. clamping range	1-16 mm	
D2 (mm)	25	
L1 (mm)	160	
D (mm)	35	
L2 (mm)	32	
Clamping nut type	ER 25 MINI	
23297...	Ident. No.	097

Prod. Gr. 295

ORION® ERICKSON short drill chuck system
With cylindrical shaft



Application:
For use on NC and CNC machining equipment.

- With adjustable longitudinal stop
- Collet no. 23326

- Execution:**
- Min. tensile strength at core 800 N/mm
 - Hardened
 - Clamping of drill bits on drill heel possible

- Advantage:**
- With straight shank - extremely slim design
 - Very good accessibility in confined spaces



Collet type	DKS	DK 30	DK 30	DK 20	DK 20	DK 10	DK 10	
d1 (mm)	8	12	12	20	20	25	25	
Min./max. clamping width	1-4 mm	1-6.5 mm	1-6.5 mm	1-10 mm	1-10 mm	2.5-14.5 mm	2.5-14.5 mm	
Width across flats	9 mm	13 mm	13 mm	19 mm	19 mm	24 mm	24 mm	
D (mm)	10	14	14	21	21	27	27	
L (mm)	100	76	140	76	140	76	140	
L2 (mm)	32	36	36	44	44	49	49	
Min. clamp in depth (mm)	20	38	43	41	41	55	55	
Max. clamp in depth (mm)	42	99	105	107	178	107	120	
23325...	Ident. No.	295	300	305	310	315	320	325

Prod. Gr. 218

Accessories for		23325 295	23325 300	23325 305	23325 310	23325 315	23325 320	23325 325	
23325...	Spare clamping nut for ERIKSON system	Ident. No.	410	420	420	430	430	440	440

Compatible ERIKSON-type collet chucks no. 23326 001-225 page 777

ORION® Cone wiper

Application:

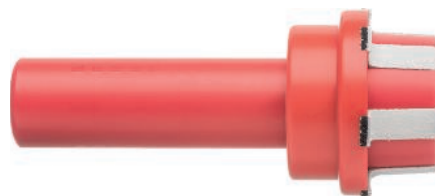
For cleaning tool chucks on machine spindles, tapered sleeves or taper gauges.

Execution:

- **No. 23500 010–23500 060:** MT taper shank
- **No. 23500 100–23500 130:** ST taper shank
- **No. 23780:** Hollow shank taper (HST) for taper and face



No. 23500



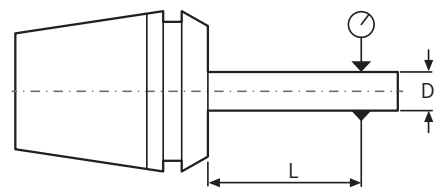
No. 23780

Suitable for tool holding device	23500...		23500...		23780...	
	Ident. No.		Ident. No.		Ident. No.	
MT 1	010	●	-	-	-	-
MT 2	020	●	-	-	-	-
MT 3	030	●	-	-	-	-
MT 4	040	●	-	-	-	-
MT 5	050	●	-	-	-	-
MT 6	060	●	-	-	-	-
SK 30	-	-	100	●	-	-
SK 40	-	-	110	●	-	-
SK 50	-	-	120	●	-	-
SK 60	-	-	130	●	-	-
HSK 32/A-C	-	-	-	-	020	●
HSK 40/A-C	-	-	-	-	030	●
HSK 50/A-C	-	-	-	-	040	●
HSK 63/A-C	-	-	-	-	050	●
HSK 80/A-C	-	-	-	-	060	●
HSK 100/A-C	-	-	-	-	070	●

Prod. Gr. 206

i TYPE ER collet chucks - concentricity tolerances to DIN ISO 15488

D		L	Concentricity tolerance DIN ISO 15488 Class 2 standard model*
H7			
Nominal diameter			
Above	Up to		
mm			
1	1.6	6	0,015
1.6	3	10	
3	6	16	
6	10	25	
10	18	40	0,020
18	26	50	



ORION Collet chucks type ER DIN 6499/ISO 15488-B (ISO 15488)
for milling chucks no. 23300, 23304, 23305

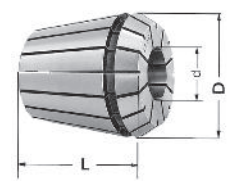
Application:
For clamping tools with straight shanks.

Execution:

- Fully hardened and polished
- Double-conical, slotted on both sides, with extracting groove
- Suitable for all standard collet chucks of type ER

Advantage:

- Large and effective clamping lengths as well as high clamping forces are achieved thanks to double slots
- Flexing movements of the milling cutters are ruled out



Collet type	ER 11 (4008 E)	ER 11 (4008 E)	ER 16 (426 E)	ER 16 (426 E)
Min./max. clamping range	1-7 mm	1-7 mm	1-10 mm	1-10 mm
D (mm)	11.5	11.5	17	17
L (mm)	18	18	27.5	27.5
Coolant supply	No	No	No	No
Clamping bypass (mm)	-0.5	-1	-0.5	-1.0
d (mm)	23320... Ident. No.	23320... Ident. No.	23320... Ident. No.	23320... Ident. No.
1	011 ●	-	101 ●	-
2	012 ●	-	-	102 ●
3	-	013 ●	-	103 ●
4	-	014 ●	-	104 ●
5	-	015 ●	-	105 ●
6	-	016 ●	-	106 ●
7	-	017 ●	-	107 ●
8	-	-	-	108 ●
9	-	-	-	109 ●
10	-	-	-	110 ●

Prod. Gr. 295

ORION® Collet chucks type ER DIN 6499/ISO 15488-B (ISO 15488)
for milling chucks no. 23300, 23304, 23305

Application:

For clamping tools with straight shanks.

Execution:

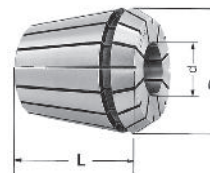
- Fully hardened and polished
- Double-conical, slotted on both sides, with extracting groove
- Suitable for all standard collet chucks of type ER

Advantage:

- Large and effective clamping lengths as well as high clamping forces are achieved thanks to double slots
- Flexing movements of the milling cutters are ruled out



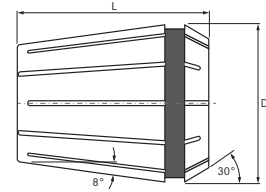
Ident. No. 202-266



	Collet type		ER 20 (428 E)	ER 25 (430 E)	ER 32 (470 E)	ER 40 (472 E)
	Min./max. clamping range		1-13 mm	1-16 mm	3-20 mm	3-26 mm
D (mm)			21	26	33	41
L (mm)			31.5	34	40	46
Coolant supply			No	No	No	No
Clamping bypass (mm)			-1.0	-1.0	-1.0	-1.0
d (mm)	23320...	23320...	23320...	23320...	23320...	23320...
	Ident. No.	Ident. No.	Ident. No.	Ident. No.	Ident. No.	Ident. No.
2	202 ●	252 ●	-	-	-	-
3	203 ●	253 ●	303 ●	-	-	-
4	204 ●	254 ●	304 ●	404 ●	-	-
5	205 ●	255 ●	305 ●	405 ●	-	-
6	206 ●	256 ●	306 ●	406 ●	-	-
7	207 ●	257 ●	307 ●	407 ●	-	-
8	208 ●	258 ●	308 ●	408 ●	-	-
9	209 ●	259 ●	309 ●	409 ●	-	-
10	210 ●	260 ●	310 ●	410 ●	-	-
11	211 ●	261 ●	311 ●	411 ●	-	-
12	212 ●	262 ●	312 ●	412 ●	-	-
13	213 ●	263 ●	313 ●	413 ●	-	-
14	-	264 ●	314 ●	414 ●	-	-
15	-	265 ●	315 ●	415 ●	-	-
16	-	266 ●	316 ●	416 ●	-	-
17	-	-	317 ●	417 ●	-	-
18	-	-	318 ●	418 ●	-	-
19	-	-	319 ●	419 ●	-	-
20	-	-	320 ●	420 ●	-	-
21	-	-	-	-	421 ●	-
22	-	-	-	-	422 ●	-
23	-	-	-	-	423 ●	-
24	-	-	-	-	424 ●	-
25	-	-	-	-	425 ●	-
26	-	-	-	-	426 ●	-

Prod. Gr. 295

ORION® Collet chuck type ER/ESX, sealed acc. DIN 6499/ISO 15488-B
For internal cooling (can be used at up to 80 bar)



	Collet type	ER 11 (4012 E)		ER 16 (425 E)		ER 20 (427 E)	
		Min./max. clamping range		3-7 mm		3-10 mm	
	D (mm)	11.5		17		21	
	L (mm)	18		27.5		31.5	
	Clamping bypass (mm)	-1		-1		-1	
	Coolant supply	Yes		Yes		Yes	
d (mm)		23320... Ident. No.		23320... Ident. No.		23320... Ident. No.	
	3	703	●	713	●	733	●
	4	704	●	714	●	734	●
	5	705	●	715	●	735	●
	6	706	●	716	●	736	●
	7	707	●	717	●	737	●
	8	-	-	718	●	738	●
	9	-	-	719	○	739	○
	10	-	-	720	●	740	●

Prod. Gr. 2AE

ORION® Collet chuck set type ER DIN 6499/ISO 15488-B (ISO 15488)
for milling chucks no. 23300, 23305

Application:

For clamping tools with straight shanks.

Execution:

- For milling chucks no. 23300, 23305
- Double-conical, slotted on both sides, with extracting groove
- Fully hardened and polished
- Suitable for all standard collets of type ER

Advantage:

- Large and effective clamping lengths as well as high clamping forces are achieved thanks to double slots
- Flexing movements of the milling cutters are ruled out

Delivery:

In aluminium case



Collet type	ER 16 (426 E)	ER 20 (428 E)	ER 25 (430 E)	ER 32 (470 E)	ER 40 (472 E)
Min./max. clamping range	1-10 mm	2-13 mm	2-16 mm	3-20 mm	4-26 mm
D (mm)	17	21	26	33	41
L (mm)	27.5	31.5	34	40	46
Coolant supply	No	No	No	No	No
Number of pieces in assortment/set	10	12	15	18	23
23320... Ident. No.	116 ●	220 ●	275 ●	332 ●	430 ●

Prod. Gr. 295

ORION® OZ collet chucks DIN 6338 A (ISO 10897)
Slotted on one side

Application:
For clamping tools with straight shanks.

Execution:
▪ suitable for milling chucks no. 23290/23295 and high-speed milling spindles no. 23275



Ident. No. 144



	Collet type	OZ 410E		OZ 444E		OZ 450E	
		Min./max. clamping range		2-25 mm		4-32 mm	
	D (mm)	25.5		35.05		44	
	L (mm)	40		52		60	
d (mm)		23291... Ident. No.		23291... Ident. No.		23291... Ident. No.	
2		003	●	047	●	-	-
3		006	●	048	●	-	-
4		009	●	051	●	116	●
5		012	●	054	●	117	●
6		015	●	057	●	120	●
7		018	●	060	●	-	-
8		021	●	063	●	126	●
9		024	●	066	●	129	●
10		027	●	069	●	132	●
11		030	●	072	●	-	-
12		033	●	075	●	138	●
13		036	●	078	●	141	●
14		039	●	081	●	144	●
15		042	●	084	●	-	-
16		045	●	087	●	150	●
17		-	-	090	●	-	-
18		-	-	093	●	156	●
19		-	-	096	●	159	○
20		-	-	099	●	162	●
21		-	-	102	●	-	-
22		-	-	105	●	-	-
23		-	-	108	●	-	-
24		-	-	111	●	174	●
25		-	-	114	●	177	●
26		-	-	-	-	180	●
28		-	-	-	-	186	●
30		-	-	-	-	192	●
32		-	-	-	-	198	●

Prod. Gr. 218

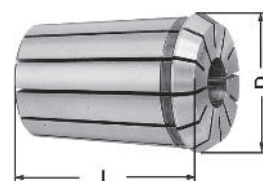
ORION® OZ collet chucks DIN 6388 B (ISO 10897)
Double slotted

Application:
For clamping drill bits and countersinks.

Execution:
▪ Suitable for milling chucks no. 23290/23295



Ident. No. 099



Tool clamp \ WZF and OZ collet chucks/collet chucks with SK 40

Collet type	OZ 415E	OZ 462E	OZ 462E	OZ 467E
	Min./max. clamping range	2-16 mm	2-25 mm	2-25 mm
D (mm)	25.5	35.5	35.05	43.7
L (mm)	40	52	52	60
Clamping bypass (mm)	-0.5	-0.5	-0.5	-0.5
d (mm)	23293...	23293...	23293...	23293...
	Ident. No.	Ident. No.	Ident. No.	Ident. No.
2	001 ●	010 ●	-	-
2.5	002 ●	011 ●	-	-
3	004 ●	013 ●	-	-
3.5	005 ●	014 ●	-	-
4	007 ●	016 ●	-	-
4.5	008 ●	017 ●	-	-
5	003 ●	019 ●	-	-
5.5	006 ●	020 ●	-	-
6	009 ●	-	072 ●	022 ●
6.5	012 ●	-	075 ●	-
7	015 ●	-	078 ●	-
7.5	018 ●	-	081 ●	-
8	021 ●	-	084 ●	028 ●
8.5	024 ●	-	087 ●	-
9	027 ●	-	090 ●	-
9.5	030 ●	-	093 ●	-
10	033 ●	-	096 ●	213 ●
10.5	036 ●	-	099 ●	-
11	039 ●	-	102 ●	-
11.5	042 ●	-	105 ●	-
12	045 ●	-	108 ●	225 ●
12.5	048 ●	-	111 ●	-
13	051 ●	-	114 ●	-
13.5	054 ●	-	117 ●	-
14	057 ●	-	120 ●	237 ●
15	063 ●	-	126 ●	243 ●
16	069 ●	-	132 ●	249 ●
14.5	-	-	123 ●	-
15.5	-	-	129 ●	-
17	-	-	138 ●	-
17.5	-	-	141 ○	-
18	-	-	144 ●	261 ●
19	-	-	150 ●	-
20	-	-	156 ●	273 ●
21	-	-	162 ●	-
22	-	-	168 ●	-
23	-	-	174 ●	-
24	-	-	180 ●	297 ●
25	-	-	186 ●	303 ●
28	-	-	-	321 ●
30	-	-	-	333 ●
32	-	-	-	345 ●

Prod. Gr. 218

ORION® OZ collet chuck sets DIN 6388 B (ISO 10897)

Slotted on one side

Application:

For clamping tools with straight shanks.

Execution:

- Suitable for milling chucks no. 23290/23295 and high-speed milling spindles no. 23275

Delivery:

In aluminium case



Type	OZ 410 E	OZ 444 E
Min./max. clamping range	2-16 mm	2-25 mm
D (mm)	25.5	35.5
L (mm)	40	52
23291...	Ident. No. 410 ●	444 ●

Prod. Gr. 218

ORION® Direct collet chuck type 574E and 575E with steep taper

Application:

For direct mounting in machine spindle, for milling tools with straight shank.

Advantage:

- Precision-ground
- With high resistance to wear

Execution:

- Ident. No. 004-025: Collet chucks type 575E
- Ident. No. 204-225: Collet chucks type E74 E



Ident. No. 004-025



Ident. No. 204-225

Suitable for tool holding device			SK 40	SK 40	SK 40	SK 40	SK 40	SK 40	SK 40
d (mm)			4	5	6	8	10	12	14
	Suitable for thread								
23340...	M16	Ident. No.	004	005	006	008	010	012	014
23340...	S 20 x 2	Ident. No.	204	205	206	208	210	212	214
Suitable for tool holding device			SK 40	SK 40	SK 40	SK 40	SK 40	SK 40	SK 40
d (mm)			16	18	20	22	24	25	
	Suitable for thread								
23340...	M16	Ident. No.	016	018	020	022	024	025	
23340...	S 20 x 2	Ident. No.	216	218	220	222	224	225	

Prod. Gr. 218

ORION® Collet chucks for ERICKSON system

For ERICKSON system

Application:

For clamping tools with straight shank.

Execution:

- For short chuck system ERICKSON sealing cone/ sealing cone shank no. 23325

- Multi-range collets for clamping the nominal diameter
- Concentricity 20 µm
- Clamp bridge -0.50 mm



Ident. No. 001-012



Ident. No. 020-032



Ident. No. 101-119



Ident. No. 206

d (mm)	Type Collet type	416E DK 30		416E DKS		417E DK 20		418E DK 10			
		Min./max. clamping range		1-6.5 mm		1-4 mm		1-10 mm		2.5-14.5 mm	
		Ident. No.		Ident. No.		Ident. No.		Ident. No.			
1		001	●	020	●	101	●	-	-	-	-
1.25		-	-	021	●	-	-	-	-	-	-
1.5		002	●	022	●	102	●	-	-	-	-
1.75		-	-	023	●	-	-	-	-	-	-
2		003	●	024	●	103	●	-	-	-	-
2.25		-	-	025	●	-	-	-	-	-	-
2.5		004	●	026	●	104	●	201	●	-	-
3		005	●	028	●	105	●	202	●	-	-
3.25		-	-	029	●	-	-	-	-	-	-
3.5		006	●	030	●	106	●	203	●	-	-
4		007	●	032	●	107	●	204	●	-	-
4.5		008	●	-	-	108	●	205	●	-	-
5		009	●	-	-	109	●	206	●	-	-
5.5		010	●	-	-	110	●	207	●	-	-
6		011	●	-	-	111	●	208	●	-	-
6.5		012	●	-	-	112	●	209	●	-	-
7		-	-	-	-	113	●	210	●	-	-
7.5		-	-	-	-	114	●	211	○	-	-

Tool clamp \ Clamping nuts and tool

d (mm)	Type	416E		416E		417E		418E	
	Collet type	DK 30		DKS		DK 20		DK 10	
	Min./max. clamping range	1-6.5 mm		1-4 mm		1-10 mm		2.5-14.5 mm	
		23326... Ident. No.		23326... Ident. No.		23326... Ident. No.		23326... Ident. No.	
8	-	-	-	-	-	115	●	212	●
8.5	-	-	-	-	-	116	●	213	●
9	-	-	-	-	-	117	●	214	●
9.5	-	-	-	-	-	118	●	215	○
10	-	-	-	-	-	119	●	216	●
10.5	-	-	-	-	-	-	-	217	●
11	-	-	-	-	-	-	-	218	●
11.5	-	-	-	-	-	-	-	219	○
12	-	-	-	-	-	-	-	220	●
12.5	-	-	-	-	-	-	-	221	○
13	-	-	-	-	-	-	-	222	●
13.5	-	-	-	-	-	-	-	223	○
14	-	-	-	-	-	-	-	224	●
14.5	-	-	-	-	-	-	-	225	●

Prod. Gr. 218

ORION® OZ-type clamping nuts Ball bearing mounted for high torques

Execution:

- For milling chucks no. 23285 and 23295

Notes:

Suitable hook wrench ref. no. 52100060, -090, -100

Clamping nut type	Min./max. clamping range	Clamping nut Ø (mm)	23295... Ident. No.	
OZ	2-16 mm	43	916	●
OZ	2-25 mm	60	925	●
OZ	4-32 mm	72	932	●

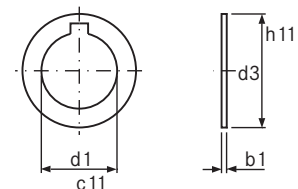
Prod. Gr. 295



ORION® Mill arbour rings (DIN 2084-1) For mill arbours

Execution:

- For mill arbours
- Type A, cut
- Steel strip hardened



d1 (mm)	d3 (mm)	b1 (mm)	Form	23135... Ident. No.		d1 (mm)	d3 (mm)	b1 (mm)	Form	23135... Ident. No.	
16	25	0.03	A	010	●	32	54	0.03	A	025	●
16	25	0.04	A	045	●	32	45	0.04	A	060	●
16	25	0.05	A	080	●	32	45	0.05	A	095	●
16	25	0.1	A	115	●	32	45	0.1	A	130	●
16	25	0.2	A	150	●	32	45	0.2	A	165	●
16	25	0.3	A	185	●	32	45	0.3	A	200	●
16	25	0.5	A	220	●	32	45	0.5	A	235	●
16	25	0.6	A	255	●	32	45	0.6	A	270	●
16	25	1	A	290	●	32	45	1	A	305	●
22	33	0.03	A	015	●	40	67	0.03	A	030	●
22	33	0.04	A	050	●	40	54	0.04	A	065	●
22	33	0.05	A	085	●	40	54	0.05	A	100	●
22	33	0.1	A	120	●	40	54	0.1	A	135	●
22	33	0.2	A	155	●	40	54	0.2	A	170	●
22	33	0.3	A	190	●	40	54	0.3	A	205	●
22	33	0.5	A	225	●	40	54	0.5	A	240	●
22	33	0.6	A	260	●	40	54	0.6	A	275	●
22	33	1	A	295	●	40	54	1	A	310	●
27	39	0.03	A	020	●	50	67	0.04	A	070	●
27	39	0.04	A	055	●	50	67	0.05	A	105	●
27	39	0.05	A	090	●	50	67	0.1	A	140	●
27	39	0.1	A	125	●	50	67	0.2	A	175	●
27	39	0.2	A	160	●	50	67	0.3	A	210	●
27	39	0.3	A	195	●	50	67	0.5	A	245	●
27	39	0.5	A	230	●	50	67	0.6	A	280	●
27	39	0.6	A	265	●	50	67	1	A	315	●
27	39	1	A	300	●						

Prod. Gr. 206

ORION® Mill arbour rings (DIN 2084-1)
For mill arbours

Execution:

- Hardened, Vickers hardness at least 590 HV 30 (54 HRC)
- Type B

- Case-hardening steel
- Lathed

d1 (mm)	d3 (mm)	b1 (mm)	Form	23140... Ident. No.	
13	22	2	B	005	●
13	22	3	B	045	●
13	22	4	B	085	●
13	22	5	B	125	●
13	22	6	B	165	●
13	22	10	B	205	●
16	27	2	B	010	●
16	27	3	B	050	●
16	27	4	B	090	●
16	27	5	B	130	●
16	27	6	B	170	●
16	27	10	B	210	●
16	27	20	B	250	●
22	34	2	B	015	●
22	34	3	B	055	●
22	34	4	B	095	●
22	34	5	B	135	●
22	34	6	B	175	●
22	34	10	B	215	●
22	34	20	B	255	●
22	34	30	B	295	●
27	41	2	B	020	●
27	41	3	B	060	●
27	41	4	B	100	●
27	41	5	B	140	●
27	41	6	B	180	●
27	41	10	B	220	●
27	41	20	B	260	●
27	41	30	B	300	●
32	47	2	B	025	●
32	47	3	B	065	●
32	47	4	B	105	●
32	47	5	B	145	●
32	47	6	B	185	●
32	47	10	B	225	●

d1 (mm)	d3 (mm)	b1 (mm)	Form	23140... Ident. No.	
32	47	20	B	265	●
32	47	30	B	305	●
40	55	2	B	030	●
40	55	3	B	070	●
40	55	4	B	110	●
40	55	5	B	150	●
40	55	6	B	190	●
40	55	10	B	230	●
40	55	20	B	270	●
40	55	30	B	310	●
50	69	2	B	035	●
50	69	3	B	075	●
50	69	4	B	115	●
50	69	5	B	155	●
50	69	6	B	195	●
50	69	10	B	235	●
50	69	20	B	275	●
50	69	30	B	315	●

Prod. Gr. 206

ORION® Carrier blocks (DIN 2079)

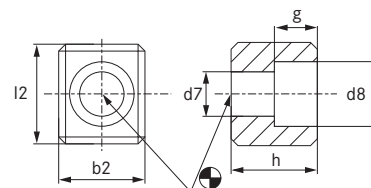
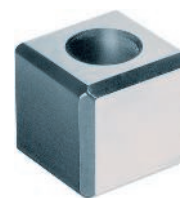
Execution:

- Hardened, at least 56 HRC
- Surfaces polished

- Case-hardening steel with tensile strength at core of at least 800 N/mm after case hardening

Notes:

Other versions and sizes on request.



Suitable for tool holding device	SK 30	SK 40	SK 50
b2 (mm)	15.9	15.9	25.4
l2 (mm)	16.5	19.5	26.5
h (mm)	16	16	25
Suitable screw ISO 4762	M6 x 16 mm	M6 x 16 mm	M12
23210...	Ident. No. 010	Ident. No. 020	Ident. No. 030

Prod. Gr. 206

ORION® Quick-change thread cutter chuck shank design with DIN 69871 A steep taper



Application:

For thread cutting and thread shaping on NC machines and machining centres.

Execution:

- The machine spindle direction of rotation must be changed for reverse motion

Advantage:

- Fast retooling thanks to quick-change chuck
- Low tool wear thanks to length compensation

Notes:

Ident. No. 610–640: The previous standard DIN 69871-1 was replaced by ISO 7388-1.

Ident. No. 650–660: For requisite pull studs, see no. 23690. For requisite quick-change inserts, see no. 21560-21566.



Ident. No. 610–640



Ident. No. 650–660

Used sizes	1	1	2	2	1	2
Tool holding device	SK 40	SK 50	SK 40	SK 50	HSK 63	HSK 63
Suitable for screw thread	M3-M12	M3-M12	M6-M20	M6-M20	M3-M12	M6-M20
Pressure length compensation (mm)	9	9	15	15	7.5	10
Tension length compensation (mm)	9	9	15	15	7.5	10
D (mm)	38	38	55	55	41	60
A (mm)	60	62	100	83	72	110
DIN	-	-	-	-	69893-1	69893-1
ISO	7388-1	7388-1	7388-1	7388-1	-	-
Form	A	A	A	A	A	A
21545...	Ident. No. 610	Ident. No. 620	Ident. No. 630	Ident. No. 640	Ident. No. 650	Ident. No. 660

Prod. Gr. 295

ORION® Quick-change thread cutter chuck (DIN 69880-1)

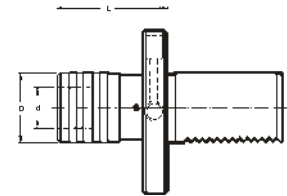
Application:

For thread cutting and thread shaping on NC machines.

Execution:

- For holding quick-change inserts, see no. 21566

- Elastic length compensation under compression and tension
- For quick-change inserts with adjustable safety coupling
- For reverse motion, the direction of rotation of the machine spindle needs to be changed.



VDI mount Ø (mm)	For insert size	Suitable for min./max. thread	Outer Ø D (mm)	Ø d (mm)	Projection length L (mm)	Pressure length compensation (mm)	Tension length compensation (mm)	22787... Ident. No.	
20	1	M3-M12	38	19	55	9	9	121	○
30	1	M3-M12	38	19	55	9	9	131	●
40	1	M3-M12	38	19	55	9	9	141	○
30	2	M6-M20	55	31	77	15	15	231	●
40	2	M6-M20	55	31	77	15	15	241	●

Prod. Gr. 295

ORION® Quick-change inserts Without safety coupling

Execution:

- No. 21565:** Precise quick-change insert
- No. 21566:** Precise quick-change insert with adjustable and almost wear-free ball safety coupling for protection against damage when tool becomes blunt or comes into contact with bottom of the hole.

Advantage:

- No. 21565:** Increased tool service life

Notes:

No. 21565: Please enquire about any shank diameters, thread sizes, or brands not listed. The DIN no. or shank dimensions (diameter and square) must be indicated on the order form in addition to the thread size.

No. 21566: Shaft diameters or thread sizes and brands not listed available upon request. The DIN no. or shank dimensions (diameter and square) must be indicated on the order form in addition to the thread size.



No. 21565



No. 21566

		1		2		1		2	
With safety coupling		No	No	No	No	Yes	Yes	Yes	Yes
D1 (mm)		30	46	32	50				
l3 (mm)		7	11	25	34				
D (mm)		19	31	19	31				
d (mm)	Square shank on screw tap	21565... Ident. No.	21565... Ident. No.	21566... Ident. No.	21566... Ident. No.	21566... Ident. No.	21566... Ident. No.	21566... Ident. No.	21566... Ident. No.
7	5.5	130 ●	205 ●	130 ●	205 ●	205 ●	205 ●	205 ●	205 ●
9	7	150 ●	220 ●	150 ●	220 ●	220 ●	220 ●	220 ●	220 ●
11	9	170 ●	240 ●	170 ●	240 ●	240 ●	240 ●	240 ●	240 ●
3.5	2.7	105 ●	-	105 ●	-	-	-	-	-
4.5	3.4	110 ●	-	110 ●	-	-	-	-	-
6	4.9	120 ●	203 ●	120 ●	203 ●	203 ●	203 ●	203 ●	203 ●
8	6.2	140 ●	210 ●	140 ●	210 ●	210 ●	210 ●	210 ●	210 ●
10	8	160 ●	230 ●	160 ●	230 ●	230 ●	230 ●	230 ●	230 ●
12	9	-	250 ●	-	250 ●	250 ●	250 ●	250 ●	250 ●
14	11	-	260 ●	-	260 ●	260 ●	260 ●	260 ●	260 ●
16	12	-	270 ●	-	270 ●	270 ●	270 ●	270 ●	270 ●
18	14.5	-	280 ●	-	280 ●	280 ●	280 ●	280 ●	280 ●

Prod. Gr. 295

Collet type		4031E GERC16-GBDD	4282E GERC25-GBDD	4537E GERC32-GBDD
D (mm)		16.7	25.7	32.7
L (mm)		27.5	34	40
Coolant supply		Inner cooling and spray nozzles	Inner cooling and spray nozzles	Inner cooling and spray nozzles
d (mm)	SW (mm)	23323... Ident. No.	23323... Ident. No.	23323... Ident. No.
3.5	2.7	770 ●	- ○	- ○
4.5	3.55	771 ○	775 ○	784 ○
6.0	5.0	772 ○	776 ○	785 ○
7.0	5.6	773 ○	777 ○	786 ○
8.0	6.3	774 ○	778 ○	787 ○
9.0	7.1	-	779 ○	788 ○
10.0	8.0	-	780 ○	789 ○
11.0	9.0	-	781 ○	790 ○
12.0	9.0	-	782 ○	791 ○
14.0	11.2	-	783 ○	792 ○
16.0	12.5	-	-	793 ○
18.0	14.5	-	-	794 ○
20.0	16.0	-	-	795 ○

Prod. Gr. 235

ORION® Tap collet type ER DIN 6499 A with female square drive

Application:

For clamping screw tapping tools.

Execution:

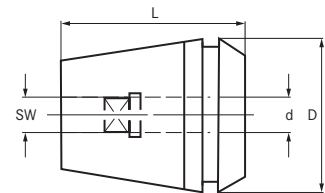
- Suitable for all standard ER collet chucks
- For machines with synchronous feed
- For use in collet chucks no. 22782 and no. 23300

Advantage:

- Female square drive to prevent twisting on screw taps

Notes:

Collets, type ER DIN 6499B for cylindrical shanks, see no. 23320



Collet type		ER 16	ER 20	ER 25	ER 32	ER 40
D (mm)		16.8	20.80	25.80	32.80	40.8
d2 (mm)		16	20	25	32	40
L (mm)		27.5	31.50	34	40	46
d (mm)	SW (mm)	23320... Ident. No.	23320... Ident. No.	23320... Ident. No.	23320... Ident. No.	23320... Ident. No.
3.5	2.7	600 ●	620 ●	640 ●	660 ●	- ○
4.0	3.0	601 ●	621 ●	641 ●	661 ●	- ○
4.5	3.4	602 ●	622 ●	642 ●	662 ●	- ○
5.0	5.0	603 ●	623 ●	643 ●	663 ●	- ○
5.5	4.3	604 ●	624 ●	644 ●	664 ●	- ○
6.0	4.9	605 ●	625 ●	645 ●	665 ●	680 ●
7.0	5.5	606 ●	626 ●	646 ●	666 ●	681 ●
8.0	6.2	607 ●	627 ●	647 ●	667 ●	682 ●
9.0	7.0	608 ●	628 ●	648 ●	668 ●	683 ●
10.0	8.0	609 ●	629 ●	649 ●	669 ●	684 ●
11.0	9.0	-	630 ●	650 ●	670 ●	685 ●
12.0	9.0	-	631 ●	651 ●	671 ●	686 ●
14.0	11.0	-	-	652 ●	672 ●	687 ●
16.0	12.0	-	-	653 ●	673 ●	688 ●
18.0	14.5	-	-	-	674 ●	689 ●
20.0	16.0	-	-	-	675 ●	690 ●
22.0	18.0	-	-	-	-	691 ●

Prod. Gr. 2AE

ORION® Reducing sleeves, morse taper (DIN 2185)

Application:

For mounting tools with Morse taper shanks.

- Fully hardened
- Male and female taper polished with pitch accuracy



Ident. No. 010-021, 032-065

Execution:

- Male and female taper in accordance with DIN 2185

Advantage:

- No clamping imprints
- Maximum concentricity

Mount, on machine side	MK 1	MK 2	MK 3	MK 3	MK 4	MK 4	MK 4	MK 4	MK 5	MK 5	MK 5	MK 6
Mount, on tool side	MK 0	MK 1	MK 1	MK 2	MK 1	MK 2	MK 3	MK 2	MK 3	MK 4	MK 5	MK 6
Length (mm)	80	92	99	112	124	124	140	156	156	171	218	
21102...	Ident. No. 010	021	031	032	041	042	043	052	053	054	065	

Prod. Gr. 207

ORION® Morse taper extension sleeves (DIN 228-1) Long version

Application:

For extending drill bits and reamers.

Advantage:

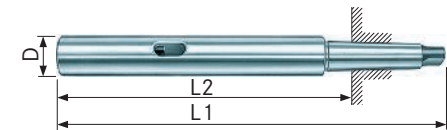
- Maximum concentricity



Ident. No. 120-260, 330-460

Execution:

- Male and female taper in accordance with DIN 2185
- Male taper, polished



Mount, on machine side	Mount, on tool side	Projection length L 2 (mm)	Cylinder Ø D (mm)	Length L 1 (mm)	21107... Ident. No.	
MK 1	MK 1	138	20	200	120	●
MK 1	MK 1	188	20	250	125	●
MK 1	MK 1	238	20	300	130	●
MK 1	MK 1	288	20	350	135	○
MK 1	MK 1	338	20	400	140	●
MK 2	MK 2	125	25	200	220	●
MK 2	MK 2	175	25	250	225	●
MK 2	MK 2	225	25	300	230	●
MK 2	MK 2	275	25	350	235	●
MK 2	MK 2	325	25	400	240	●
MK 2	MK 2	375	25	450	245	○
MK 2	MK 2	425	25	500	250	●
MK 2	MK 2	525	25	600	260	○
MK 3	MK 3	156	32	250	325	●
MK 3	MK 3	206	32	300	330	●
MK 3	MK 3	256	32	350	335	○
MK 3	MK 3	306	32	400	340	●
MK 3	MK 3	356	32	450	345	●
MK 3	MK 3	406	32	500	350	●
MK 3	MK 3	506	32	600	360	●
MK 4	MK 4	182.5	40	300	430	●
MK 4	MK 4	232.5	40	350	435	●
MK 4	MK 4	282.5	40	400	440	○
MK 4	MK 4	332.5	40	450	445	○
MK 4	MK 4	382.5	40	500	450	●
MK 4	MK 4	482.5	40	600	460	●

Prod. Gr. 207

ORION® Morse taper extension sleeves (DIN 228)

Application:

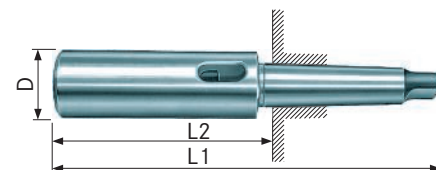
For mounting tools with Morse taper shanks.

Execution:

- Male and female taper, polished and hardened, similar to DIN 2187



Ident. No. 011-031, 033-055



Mount, on machine side	MK 1	MK 1	MK 2	MK 2	MK 2	MK 3	MK 3	MK 3	
Mount, on tool side	MK 1	MK 2	MK 1	MK 2	MK 3	MK 1	MK 2	MK 3	
Projection length L 2 (mm)	83	98	85	100	121	81	100	121	
Cylinder Ø D (mm)	20	30	20	30	36	20	30	36	
Length L 1 (mm)	145	160	160	175	196	175	194	215	
21115...	Ident. No.	011	012	021	022	023	031	032	033
Mount, on machine side	MK 3	MK 4	MK 4	MK 4	MK 5	MK 5			
Mount, on tool side	MK 4	MK 3	MK 4	MK 5	MK 4	MK 5			
Projection length L 2 (mm)	146	122.5	147.5	182.5	150.5	182.5			
Cylinder Ø D (mm)	48	36	48	63	48	63			
Length L 1 (mm)	240	240	265	300	300	300			
21115...	Ident. No.	034	043	044	045	054	055		

Prod. Gr. 207

ORION® Tapered clamping sleeves (DIN 6329)

Application:

For mounting twist drills and countersinks with straight shanks (h8) in line with DIN 6329.

Execution:

- Hole and male taper, polished
- Fully hardened
- Not suitable for milling



Adapter, on machine side D	Shank Ø d (mm)	21150... Ident. No.	
MK 1	3	103	●
MK 1	3,5	106	●
MK 1	4	109	●
MK 1	4,5	112	●
MK 1	5	115	●
MK 1	5,5	118	●
MK 1	6	121	●
MK 1	6,5	124	●
MK 1	7	127	●
MK 1	8	133	●
MK 2	6	203	●
MK 2	7	209	○
MK 2	8	215	●
MK 2	8,5	218	●
MK 2	9	221	●
MK 2	9,5	224	○
MK 2	10	227	●
MK 2	10,5	230	●
MK 2	11	233	●
MK 2	12	239	●
MK 3	12	327	○
MK 3	12,5	330	●
MK 3	14	339	●
MK 3	16	351	●

Prod. Gr. 207

ORION® Cone clamping sleeves (DIN 6328)

Application:

For mounting screw taps and reamers with straight shanks and square drives.

Execution:

- For tools with straight shank and square head in accordance with DIN 6328
- Hole and male taper, polished
- Fully hardened
- Not suitable for milling



Adapter, on machine side D	MK 1	MK 1	MK 1	MK 1	MK 2	MK 2	MK 2	MK 2	MK 2	MK 2	MK 2	MK 3	MK 3
Shank Ø d (mm)	4.5	6	7	8	6	7	8	9	10	12	14	16	16
Square width (mm)	3.4	4.9	5.5	6.2	4.9	5.5	6.2	7	8	9	11	12	12
21155... Ident. No.	103	109	112	115	203	206	209	212	215	218	303	306	306

Prod. Gr. 207

ORION® Drill chuck with threaded mount

For clockwise rotation, with toothed ring and key



Application:

For holding tools with straight shank.

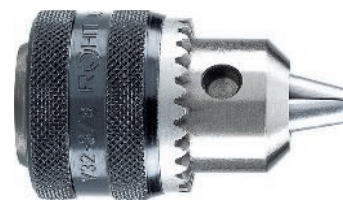
- With female thread
- Toothed ring drill chuck with key, DIN ISO 10887

Execution:

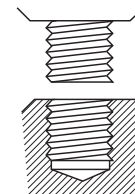
- Body head with keyholes
- Jaws hardened

Advantage:

- Very good value for money
- High clamping force thanks to toothed ring



Ident. No. 110-112



Thread adapter

Min./max. clamping width	0.8-10 mm	0.8-10 mm	1.5-13 mm
Connection thread	3/8 " x 24 UNF 3B	1/2 " x 20 UNF 3B	1/2 " x 20 UNF 3B
Outer Ø (mm)	33.3	33.3	42.4
21293... Ident. No.	110	112	130

Prod. Gr. 207

Accessories for	21293 110	21293 112	21293 130
21294... Spare key Spare key for drill chuck with toothed ring	020	020	020

ORION® Drill chuck with tapered mount

For clockwise and anti-clockwise rotation, with toothed ring and key



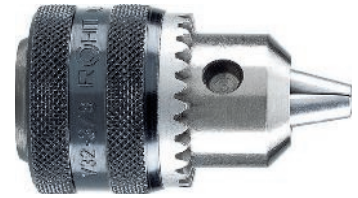
Application:
For holding tools with straight shank.

Execution:

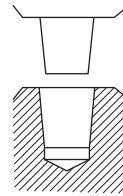
- Body head with keyholes
- Jaws hardened
- Toothed ring drill chuck with key, DIN ISO 10887

Advantage:

- Very good value for money
- High clamping force thanks to toothed ring



Ident. No. 010-030, 042



Drill chuck cone in line with DIN ISO 239-B

Min./max. clamping width		0.8-10 mm	1-10 mm	1.5-13 mm	3-16 mm	3-16 mm
Suitable for taper		B 12	B 16	B 16	B 16	B 18
Outer Ø (mm)		33.5	42.4	42.4	50	50
21293...	Ident. No.	010	020	030	040	042

Prod. Gr. 207

Accessories for		21293 010	21293 020	21293 030	21293 040	21293 042
21294...	Spare key Spare key for drill chuck with toothed ring	020	020	020	030	030

ORION® Drill chuck with tapered mount

Suitable for impact drilling



Application:
For clamping and releasing drill bits quickly without a key.

Execution:

- Self-clamping
- Industrial version for hand-guided machines

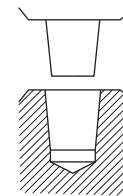
▪ With internal taper chuck in accordance with DIN 238

Advantage:

- No tools required for operation, therefore fast retooling
- Securely clamped using clamping force retention



Ident. No. 010-040



Drill chuck cone in line with DIN ISO 239-B

Min./max. clamping width		0-8 mm	0-10 mm	0-10 mm	1-13 mm	1-13 mm	3-16 mm	3-16 mm
Suitable for taper		B 12	B 12	B 16	B 12	B 16	B 16	B 18
Outer Ø (mm)		32	36	42.5	40.2	40	46	46
21304...	Ident. No.	010	020	022	030	032	040	042

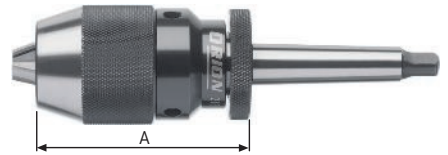
Prod. Gr. 207

ORION® Drill chuck Self-clamping



Application:
For clamping and releasing drill bits quickly without a key.

- Execution:**
- Drill chuck and mounting taper form one unit
- Advantage:**
- Very good value for money



Min./max. clamping width	1-13 mm	1-13 mm	1-13 mm	3-16 mm	3-16 mm	3-16 mm
Morse taper size	MK 2	MK 3	MK 4	MK 2	MK 3	MK 4
A (mm)	95.5	95.5	98	100.5	100.5	102
Outer Ø (mm)	50.5	-	-	-	-	-
21316...	Ident. No. 020	030	040	220	230	240

Prod. Gr. 295

ORION® Morse taper arbours (DIN 238) With morse taper for drill chucks

Application:
For holding drill chucks.

- Execution:**
- Hardened and polished
 - Drill chuck holders with steep taper, see no. 23272



Ident. No. 101-162, 164-224

Drill chuck taper	Morse taper size	Min. taper external Ø (mm)	Max. taper external Ø (mm)	21269... Ident. No.	Drill chuck taper	Morse taper size	Min. taper external Ø (mm)	Max. taper external Ø (mm)	21269... Ident. No.
B 10	MK 1	9.4	10.095	101	B 18	MK 1	16.2	17.78	181
B 10	MK 2	9.4	10.095	102	B 18	MK 2	16.2	17.78	182
B 12	MK 1	11.1	12.06	121	B 18	MK 3	16.2	17.78	183
B 12	MK 2	11.1	12.06	122	B 18	MK 4	16.2	17.78	184
B 12	MK 3	11.1	12.06	123	B 18	MK 5	16.2	17.78	185
B 16	MK 1	14.5	15.733	161	B 22	MK 2	19.8	21.793	222
B 16	MK 2	14.5	15.733	162	B 22	MK 3	19.8	21.793	223
B 16	MK 3	14.5	15.733	163	B 22	MK 4	19.8	21.793	224
B 16	MK 4	14.5	15.733	164					

Prod. Gr. 207

ORION® Ejector drifts for tapered tools with flat tangs (DIN 317)

Application:
For driving out taper shanks in accordance with DIN 228 with flat tangs.

- Execution:**
- Made of special steel
 - Hardened
 - Tempered with burnished finish



Suitable for morse taper tools	MK 0	MK 1 MK 2	MK 3	MK 4	MK 5 MK 6
Length (mm)	90	140	190	225	265
21160...	Ident. No. 005	010	030	040	050

Prod. Gr. 207

ORION® Length adjustment set

Application:

Adjusting sleeve for safe and rapid clamping of tool to be shrink-fitted.

Execution:

- The tool is set to the desired length using the scale and secured with a stud.

Advantage:

- For quick and safe length adjustment during shrinking
- Different sleeves allow adjustment to intermediate sizes
- No complicated handling of measuring equipment

Delivery:

6 length adjustment sleeves, mounting block, hexagon key



Adjusting the shrinking depth



Ready for shrinking

Min. clamping range (mm)	6
Max. clamping range (mm)	20
23401...	Ident. No. 080

Prod. Gr. 295

ORION® 2D mechanical edge finder

For milling and jig boring machines

Application:

The edge finder is used to accurately determine the edges of workpieces and bore centre points in relation to the working spindle during milling, for example.

Execution:

- For use with speeds from 400 - 600 rpm
- Repeatability of approx. 0.01 mm
- Hard chrome-plated probe head

Notes:

Spare part: Edge finder spring ref. no. 23921500



Sensor design	Single 2-D probe	Offset 2-D probe
Clamp in shank Ø (mm)	10	10
Probe head Ø (mm)	10	4/10
Repeat accuracy (mm)	0.01	0.01
23921...	Ident. No. 030	050

Prod. Gr. 227

ORION® 2D edge finder

With illuminated display and spring-loaded probe ball

Application:

For precise alignment of workpiece reference surfaces or edges to determine the bore centre points centrally to the working spindle.

Execution:

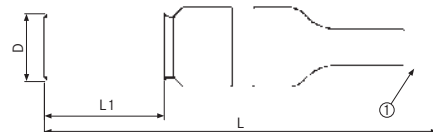
- **Ident. No. 005-010:** Functional components are hardened and ground
- **Ident. No. 011:**
 - Functional components are hardened and polished
 - With acoustic signal



Ident. No. 005



Ident. No. 010-011



① Spring ball Ø 10,000

Sensor design	2-D	2-D	2-D audible
Clamping shank Ø D (mm)	16	20	20
Probe head Ø (mm)	10	10	10
Clamping length L1 (mm)	35	45	45
Length L (mm)	99	94	119
Reading	Light indicator	Light indicator	Audible light indicator
Repeat accuracy (+/-) (mm)	0.01	0.01	0.01
23923...	Ident. No. 005	Ident. No. 010	Ident. No. 011

Prod. Gr. 298

ORION® 3D edge finder

With illuminated display and spring-loaded probe ball

Application:

For precise alignment of workpiece reference surfaces or edges to determine the bore centre points centrally to the working spindle.

Advantage:

- **Ident. No. 015-020:** 3D model also suitable for approaching the workpiece in the Z direction (vertically)
- **Ident. No. 025:** 3-D model also suitable for moving the workpiece in the Z direction (vertically)

Execution:

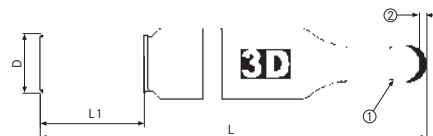
- Functional components are hardened and polished
- **Ident. No. 025:** With acoustic signal



Ident. No. 020-025



Ident. No. 015



① Spring ball Ø 10,000
② Tracer path approx. 3 mm

Sensor design	Clamping shank Ø (mm)	Probe head Ø (mm)	Clamping length L1 (mm)	Length L (mm)	Reading	Repeat accuracy (+/-) (mm)	23923... Ident. No.
3-D	16	10	35	111	Light indicator	0.01	015 ●
3-D	20	10	45	106	Light indicator	0.01	020 ●
3-D audible	20	10	45	131	Audible light indicator	0.01	025 ●

Prod. Gr. 298

ORION® Zero adjustment device with dial gauge

Application:

The device is placed on the workpiece. Using the machine spindle, the cutting tool is moved up to the probe until the indicator is at zero for the first time. Now the reference dimension for the distance from the workpiece of 100 mm has been reached.

Scale value (mm)	0.01
Reference dimension (mm)	100
Repeat accuracy (+/-) (mm)	0.01
23931...	Ident. No. 010

Prod. Gr. 227

Execution:

- Height adjustment gauge to determine position of workpiece surface in the Z direction on milling machines and lathes, can also be used horizontally
- Non-magnetic



ORION® Zero adjustment device, optical, 50 mm (magnetic)

Application:

For determining the position of workpiece surfaces or workpiece lengths in the Z direction on lathes or milling machines

Execution:

- The device is placed on the workpiece. The spindle is now moved carefully up to the device. As soon

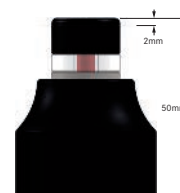
as the LED lights up, the reference dimension of 50 mm has been reached. Allowance has been made for a safety spring travel of approx. 2 mm for going beyond the 50 mm. A magnetic version can be supplied for horizontal use.

Delivery:

Zero point adjustment device with test certificate

Version	Steel	Magnetic
Shaft Ø (mm)	39	39
Probe head Ø (mm)	19	19
Reference dimension (mm)	50	50
Repeat accuracy (+/-) (mm)	0.01	0.01
23933...	Ident. No. 020	030

Prod. Gr. 227





technical introduction – tool presettlers
 success is a matter of adjustment – increase productivity with the right settings



ATORN tool presettlers save time and money, putting you an extra step ahead of the competition. your tools are set and measured while your machine is producing metal chips – so there's no downtime.

the right tool is what counts

precisely measured tools, optimised machine operating times and a longer service life for tools increase the output of your production facility by at least 15 per cent. ATORN tool presettlers pay for themselves quickly, easy to operate, gentle on your budget and big on performance.

simple!

- the ATORN concept: the user is the most important thing when it comes to working efficiently day in, day out
- state-of-the-art image processing makes tool presetting easy
- fast training thanks to an intuitive ATORN operating concept

exactly!

- image processing system with dynamic crosshair for contact-free and accurate tool measurement, regardless of the operator
- brand quality such as Bosch pneumatics, THK guides, Heidenhain glass scales provide accuracy and a long, maintenance-free service life
- tool chuck spindle SK 50 with high levels of repeatability and integrated calibration edges

economical!

- three-in-one: measure, adjust and check tools
- supplied as a complete package with support table, adapters and utensil storage, label printers
- "Made in Germany" quality at an unbeatable price/performance ratio
- worldwide service

	scratching	scriber	laser	projector	ATORN
investment	✓	✓	—	■	✓
machine operating time	—	✓	—	✓	✓
repeatability	—	—	✓	■	✓
measurable parameters	—	—	■	—	✓
process reliability	—	—	✓	■	✓
cost of measurements	—	—	✓	■	✓
written measurement report	—	—	—	■	✓
tool inspection	—	—	—	—	✓
conclusion	uneconomical, high risk of tool damage	low purchasing cost, but unsuitable for measuring and setting tools	high purchasing costs as each machine requires a separate laser	outdated technology, a setting device with image processing is required for new purchases	higher profitability thanks to reliable manufacturing quality, longer machine operating times, optimised service life and less waste

✓ standard ■ optional — not available

what are the benefits of setting tools correctly with ATORN presettlers?

- increase your production quality
- optimised machine running time
- efficient processes around the tool
- no waste
- increased tool life
- can be used directly in production





overview: tool presetters

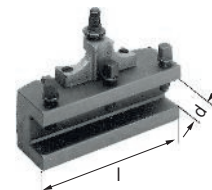
Function	Description	ICbasic	IC1	IC2	IC3
operation/features					
EZclick	Menu operation via a rotary/push button	✓	—	—	—
EZtouch	Menu operation via touchscreen	—	✓	✓	✓
EZslide	Window areas moved via touchscreen	—	—	—	✓
Monitor	TFT colour monitor	7.0 inch	13.3 inch	13.3 inch or 24 inch	17.0 inch
Operating system	Operating system of the measuring device control system	Linux	Windows 10	Windows 10	Windows 10
Device design					
Spindle	SK 50 tool holding spindle	✓	✓	✓	✓
Pneum. spindle functions	4 x 90° indexing, 360° spindle brake	■	✓	✓	✓
Under-table	Under-table in sturdy industrial design	■	✓	✓	✓
Label printer	Thermal label printer	■	✓	✓	✓
Adapter shelf	For storing adapters	■	✓	✓	✓
Options					
Vacuum spindle	Tool holding spindle, SK 50 vacuum	■	■	■	■
universal spindle for power-operated tool clamping	Power-operated universal tool holding spindle	—	■	■	■
Adapters	Standard selection, other adapters on request	■	■	■	■
Adapter shelf	Additional adapter shelves as required	■	■	■	■
EZprotection/ EZspindle-protection	Cover hoods for protecting against dust and dirt	■	■	■	■
EZmaintain	Conditioning unit for preparing compressed air for the device	■	■	■	■
EZturn	Rotation centre measurement with monochrome camera	—	—	■	■
Autofocus	Automatic focus of the tool cutting edge	—	■	■	■
Software functions					
Dynamic crosshair	Dynamic crosshair for automatic measurement	✓	✓	✓	✓
Cutting edge shape detection	Automatic cutting edge shape detection	✓	✓	✓	✓
Cutting edge inspection	Magnification of the cutting edge in incident light for quality control	12x	20x	20x 13.3 inch / 38x 24 inch	28x
Multi-cutter	Software function for concentricity and axial runout for multi-cutting edge tools	✓	✓	✓	✓
EZmax	Software function for determining and measuring the tool contour	✓	✓	✓	✓
Zero point monitoring	safety prompt for adapter zero points for preventing a machine crash	✓	✓	✓	✓
EZstart	Software function for quickly measuring standard tools	—	✓	✓	✓
Adapter management	Saving and managing adapter zero points	✓ 99	✓ 99	✓ 99	✓ 999
Tool management	Saving tool data	■	✓	✓	✓ 15000
Online help	Integrated help texts	✓	✓	✓	✓
EZnavigator	compass needle – simple camera positioning for measuring set values on the tool	■	✓	✓	✓
Graphics library	Graphic display of the tools	—	—	■	✓
Tooling sheets	Create and save tool lists	—	—	■	■
Projector function	Conversion to projector function with crosshair	■	✓ Positionable	✓ Positionable	✓ Positionable
Data output					
Label printing	Output of thermal labels	■	✓	✓	✓
List print	Output of e.g. A4 reports	—	✓	✓	✓
USB	USB-2.0 interfaces, data output via USB	✓ 1 piece	✓ 4 pieces	✓ 4 pieces	✓ 4 pieces
LAN/network	Data output via network connection	—	—	■	■
COM/serial	data output via RS232 interface	✓	✓	✓	✓
control-specific to the CNC machine	output of measurement values and tool data suitable for machines from the IC2/IC3 tool management on the CNC machine	—	—	■	■
control-specific into the network	software for tool management and for transmitting measured values to the network via separate, customer PC	■	■	■	■

✓ standard ■ optional — not available

ORION® Quick-change holder D

Application:
For holding tools.

Execution:
▪ For steel tool holder head no. 22240



Steel tool holder head size shape No. 22240			B	B
Clamping width d (mm)			25	32
22251...	BD 25120	Ident. No.	060 ●	-
22251...	BD 25140	Ident. No.	070 ●	-
22251...	BD 32120	Ident. No.	-	080 ●
22251...	BD 32140	Ident. No.	-	090 ●

Prod. Gr. 264

ORION® Quick-change holder J

Application:
For holding tools.

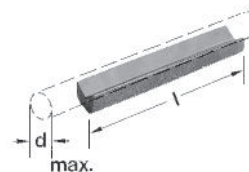
Execution:
▪ For steel tool holder head no. 22240

Steel tool holder head size shape No. 22240			B
Clamping Ø (mm)			40
22253...	BJ 40120	Ident. No.	030 ●

Prod. Gr. 264



ORION® Vee block P



Vee block P

Steel tool holder head size shape No. 22240	Length l (mm)	Max. clamping Ø d (mm)	BP 20130
B	130	20	22259... Ident. No. 020 ●

Prod. Gr. 264



THE HIGHEST QUALITY PRODUCTS
FOR MAXIMUM EFFICIENCY.

WE HAVE WHAT IT TAKES.



For a complete range of products that meet the toughest demands, visit www.iconridge.com

Workpiece clamping	
	Lathe and circular grinder accessories
	Technical introduction - lathe chucks
	Selection overview - Lathe chuck selection
	Lathe chucks and accessories
	Pressure collet chuck and draw-in collet chuck
	Technical introduction - quick-action clamps
	Quick-action clamps
	Electronic drills vices
	High-pressure machine vices
	Positioning elements

ORION® Fixed lathe centres (DIN 806) Full tip

Application:

For centring and supporting long and narrow workpieces on lathes and grinding machines.

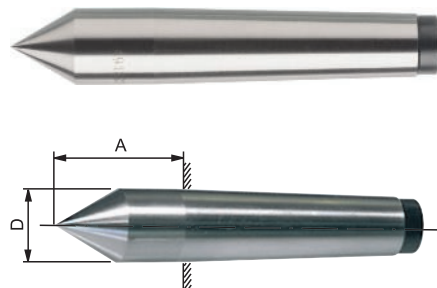
- Made of tool steel
- Fully hardened and ground

Execution:

- Tip angle 60°

Morse taper size	MK 2	MK 3	MK 4	MK 5
Programming dimension A (mm)	36	44	57.5	70.5
Outer Ø D (mm)	18	24.1	31.6	44.7
22 104... Ident. No.	020	030	040	050

Prod. Gr. 211



ORION® Fixed lathe centres (DIN 806) Carbide tip

Application:

For centring and supporting long and narrow workpieces on lathes and grinding machines.

Advantage:

- Wear-resistant cemented carbide tip

Execution:

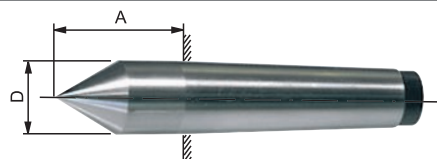
- Tip angle 60°
- Carbide-tipped
- Precision-ground

Notes:

Centring points in special design on request.

Morse taper size	MK 2	MK 3	MK 4	MK 5
Flattening Ø D (mm)	7	11	14	18
Programming dimension A (mm)	36	44	57.5	70.5
Outer Ø D (mm)	18	24.1	31.6	44.7
22 107... Ident. No.	020	030	040	050

Prod. Gr. 211



ORION® Live lathe tips With extended moving point

Execution:

- Tip angle 60°
- Moving point is hardened and can be reground multiple times

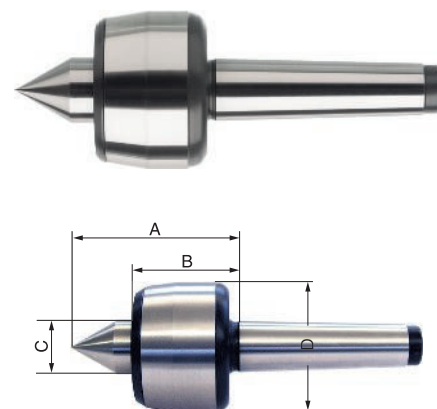
Advantage:

- Precision roller bearings ensure a high level of concentricity
- Special seal prevents the ingress of dirt and coolant.
- Maintenance-free owing to permanent lubrication

Morse taper size	MK 1	MK 2	MK 3	MK 4
Programming dimension A (mm)	60.5	65	79.5	103
Programming dimension for housing B (mm)	43.5	41	48.5	61.5
Max. workpiece weight (kg)	100	200	500	800
Max. rotation speed (U/min(rpm))	7000	7000	5000	3800
Concentricity tolerance (mm)	0.01	0.005	0.005	0.005
Ø of housing D (mm)	36	45	60	70
Point Ø C (mm)	15	20	25	32
22 124... Ident. No.	110	120	130	140

Morse taper size	MK 5
Programming dimension A (mm)	129
Programming dimension for housing B (mm)	78.5
Max. workpiece weight (kg)	2000
Max. rotation speed (U/min(rpm))	3000
Concentricity tolerance (mm)	0.005
Ø of housing D (mm)	90
Point Ø C (mm)	40
22 124... Ident. No.	150

Prod. Gr. 211





ARE YOU LOOKING FOR
EVEN MORE BRANDS?

WE HAVE WHAT IT TAKES.

For a complete range of products that meet the toughest demands, visit www.iconridge.com

i hand chuck - tapered rod chuck and flat spiral chuck

Lathe chucks in the hand clamping chuck remit are divided into tapered rod and scroll chucks. The difference lies in the mechanical system in the chuck body. The scroll chuck drives the jaws with the spiral to the workpiece, while this is achieved by tapered rods with the tapered rod chuck. The criteria for selection are essentially accuracy, max. rotation speed, clamping force, jaw change time and acquisition costs.

Tapered rod chucks

tapered rod chucks with quick-change jaw system are used where extremely high clamping forces, high concentricity and reliable continuous repeat accuracies are required. owing to the quick-change jaw system, the jaws can be quickly and easily turned, replaced or displaced across the entire clamping range within a few seconds.

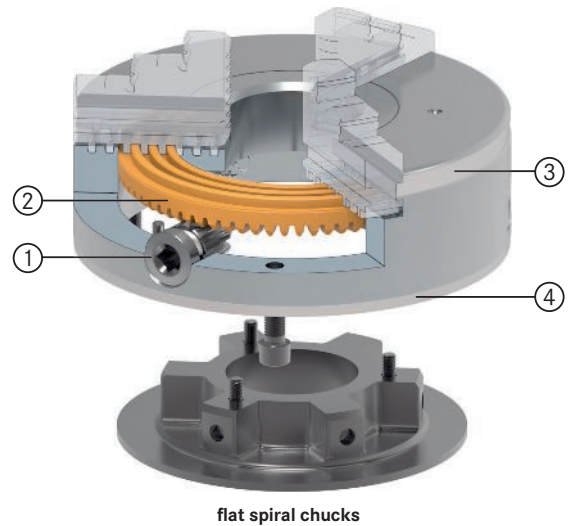
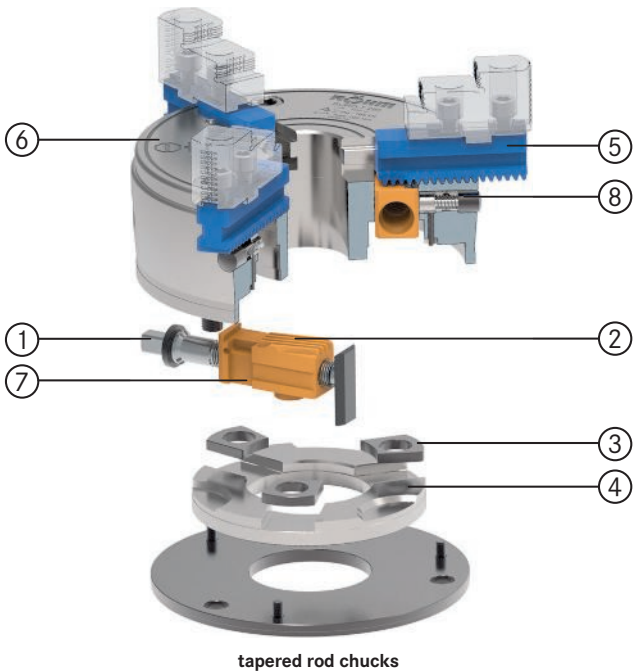
mode of operation: through the tangentially arranged threaded spindle ①, the force is transmitted through a tapered rod with female thread ②. the tapered rod moves the drive ring via a slide ring ③. two further slide rings in the drive ring ④ lead the forces to the other two tapered rods. the tapered rods with inclined profile engage in the base jaws ⑤, guaranteeing accurate, centric clamping. the jaws can be quickly and easily turned, replaced or displaced across the entire clamping range. this requires the tapered rods to be brought out of contact by turning the key to the left; the indicator pin emerges ⑥. in this position, the jaws are protected from being ejected should the machine spindle be carelessly started. this requires the rotary piston ⑦ of each jaw to be unlocked via the corresponding stud ⑧ on the outside diameter of the chuck. straight and large power transmission surfaces between tapered rod and jaw serration generate very high clamping force and accuracy with a long service life. the high clamping force is achieved by manually turning via the key without particular effort. lubrication: to maintain the clamping force, the lathe chucks must be lubricated regularly.

Scroll chucks

lathe chucks with spiral ring are used on lathes, rotary tables and dividers. clamping force, rotation speed and concentricity are usually below tapered rod technology. proven chucks with optimum price/performance ratio. with the spiral ring, the jaws can be displaced across the entire clamping range in order to clamp workpieces with different clamping diameters quickly and without moving the jaws.

with the help of the radially arranged pinion, the force is transmitted to the hardened spiral ring via a bevel gear drive and forwarded to the clamping jaws via the spiral.

- ① radially arranged drive for defined torque application using a torque wrench
- ② spiral ring for precise power transmission and fast jaw adjustment across the entire clamping range
- ③ protection of the machine spindle from coolants through splash water edge
- ④ control edge for quick and easy adjustment on the machine



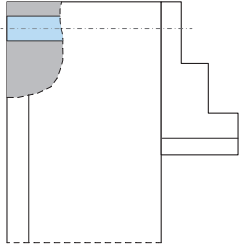


Lathe chuck integration

Depending on the manufacturer and the lathe spindle, the interfaces of the machines and lathe chucks vary. In order to ensure the compatibility of machine to lathe chuck, the right selection of this interface is essential.

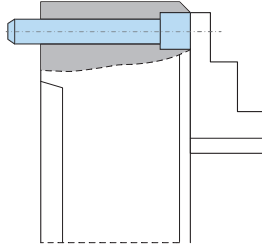
DIN 6350

Cylindrical mounting
Form A - Mounting from the rear



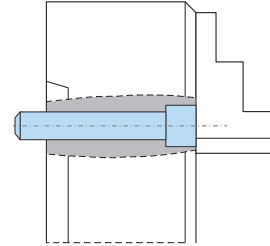
DIN 6350 BVV

Cylindrical mounting
Mounting from the front



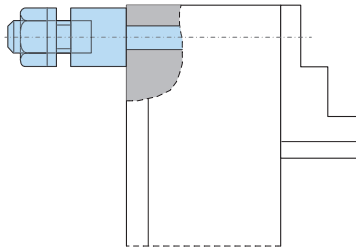
DIN 55026

Front attachment, mounting with
hexagon socket screws on the spindle head



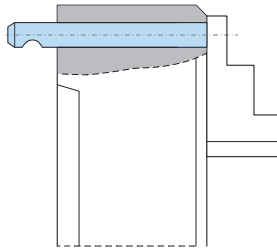
DIN 55021

Stud with nut



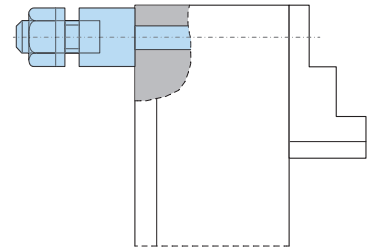
DIN 55029 (ISO 702-2)

Mounting with camlock stud bolts



DIN 55027 (ISO 702-3)

Stud bolt with collar nut
DIN 55021
Stud with nut


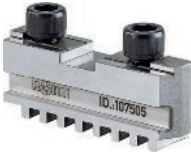














Clamping jaws

Clamping jaws are the only interfaces between workpiece and chuck and therefore the key component for greater productivity and efficiency. Using the correct clamping jaw not only guarantees perfect power transmission and secure workpiece clamping, it also ensures optimal utilisation of machine and tool performance. Clamping jaws are usually hardened. In order to achieve a high degree of concentricity, they must be ground down to the lathe chuck. The exceptions are block jaws, segment jaws and in some cases special jaws. These jaws are “re-machined” by the user to the desired contour. They allow for clamping of product-specific contours and damage-free clamping for machining finished parts. Hard clamping jaws run the risk of form closure during finished part machining.

That means that possible imprints may be left on the workpiece. This is desired for claw jaws or profiled clamping jaws. They are used solely for the purpose of clamping unmachined parts. The form fit produced between the clamping jaw and unmachined part provides secure clamping properties for high cutting forces that usually occur when clamping and rough machining unmachined parts. Clamping jaws and lathe chucks from different manufacturers are rarely compatible with one another. To determine the appropriate clamping jaw or plain jaw, various information is required. Chuck manufacturer, chuck type, chuck diameter and, if applicable, interface of the jaw with groove width and hole spacing. If slot and tenon or pointed teeth (1/16" x 90°; 3/32" x 90°; 1.5 mm x 60°; 3 mm x 60°).

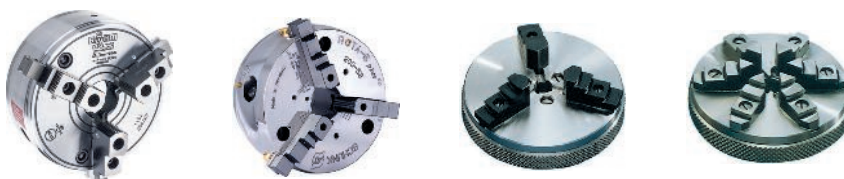
Block jaws:	Plain and interchangeable jaw grips, slot and tenon:	Interchangeable jaw grips, pointed teeth:
 <p>Drilling jaw, outwardly stepped, hardened</p>	 <p>Plain jaw with fastening screw</p>	 <p>Unstepped interchangeable jaw grip, unhardened</p>
 <p>Drilling jaw, outwardly stepped, hardened</p>	 <p>Plain jaw with fastening screw</p>	 <p>Stepped jaw attachment, hardened</p>
 <p>Drilling jaw, outwardly stepped, hardened</p>	 <p>Plain jaw with fastening screw</p>	 <p>Segmented jaw, unhardened</p>
	 <p>Plain jaw with fastening screw</p>	 <p>Claw jaw, hardened</p>
	 <p>Plain jaw with fastening screw</p>	



Selection overview - Lathe chuck selection



	BISON	RÖHM 3-B ZS	RÖHM 4-B ZS	RÖHM 3-B ZSU	RÖHM 4-B ZSU
Type	Scroll chuck	Scroll chuck	Scroll chuck	Scroll chuck	Scroll chuck
Chuck diameter	80 – 400 mm Additional Ø on request	80 – 315 mm Additional Ø on request	80 – 250 mm Additional Ø on request	160 – 250 mm Additional Ø on request	160 – 250 mm Additional Ø on request
Body	Steel/cast iron	Steel	Steel	Steel	Steel
Mount	Cylindrical centre mount DIN 6350 ISO 702-2 (DIN 55029) ISO 702-3 (DIN 55027)	Cylindrical centre mount DIN 6350 ISO 702-2 (DIN 55029) ISO 702-3 (DIN 55027) On request: DIN 6350 BVV	Cylindrical centre mount DIN 6350 ISO 702-2 (DIN 55029) ISO 702-3 (DIN 55027) On request: DIN 6350 BVV	ISO 702-3 (DIN 55027) On request: DIN 6350 DIN 6350 BVV ISO 702-2 (DIN 55029)	ISO 702-3 (DIN 55027) On request: DIN 6350 DIN 6350 BVV ISO 702-2 (DIN 55029)
Opening	Yes	Yes	Yes	Yes	Yes
Number of jaws					
Jaw type					
Workpiece					
Clamping force, steel					
Clamping force, cast iron					
Rotation speed, steel					
Rotation speed, cast iron					
Accuracy					



	RÖHM Duro-T	RÖHM Rota plus 2.0	ORION 3-B	ORION 6-B
Type	Tapered rod chuck	Tapered rod chuck	scroll chuck	scroll chuck
Chuck diameter	160 – 255 mm Additional Ø on request	160 – 315 mm Additional Ø on request	57 – 72 mm Additional Ø on request	102 mm Additional Ø on request
Body	Steel	Steel	Steel	Steel
Mount	Cylindrical centre mount DIN 6350 ISO 702-3 (DIN 55027) On request: ISO 702-2 (DIN 55029)	Cylindrical centre mount DIN 6350 ISO 702-3 (DIN 55027) On request: ISO 702-2 (DIN 55029) ISO 702-1 (DIN 55026) BVV	Intermediate flange or shank	Intermediate flange or shank
Opening	Yes	Yes	Yes	Yes
Number of jaws				
Jaw type				
Workpiece				
Clamping force, steel				
Rotation speed, steel				
Accuracy				

ORION® Scroll chuck

Application:

Suitable for individual or series parts for small workpieces with thin walls as well as for use as a workpiece holder on drilling and grinding machine tables.

Execution:

- Steel body
- Jaws are case-hardened and reversible

- Ref. no. 010/020 with 3 jaws, ref. no. 040 with 6 jaws.
- Chuck with soft jaws
- Chuck with collet holder or Morse taper shank
- Centric clamping

Notes:

Chucks available as 3-jaw or 6-jaw design, also corrosion-protected. Chucks with aluminium body available; quote on request.

Outer Ø (mm)	57	72	102
Max. clamping range Ø (mm)	55	70	100
Clearance hole (mm)	8	8	10
Height without jaws (mm)	13.5	15.7	21
22380...	Ident. No. 010	020	040
	●	●	●

Prod. Gr. 220



Ident. No. 010-020



Ident. No. 040

ORION® Workpiece stop

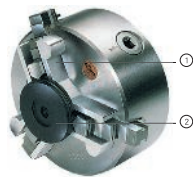
Application:

For clamping short parts on lathe chucks.

Execution:

- Fastened with 3 magnets that are built into the limit stop by simply placing on the lathe chuck body.

- Stop is coloured blue
- Contact surfaces are polished
- Material: aluminium



1 = Workpiece stop
2 = Workpiece



Workpiece stop

Workpiece stopper height	15 mm	20 mm	25 mm	30 mm	35 mm
Min. jaw width (mm)	25	25	25	25	25
Max. jaw width (mm)	55	55	55	55	55
For min./max. workpiece Ø	15-130 mm	15-130 mm	15-130 mm	15-130 mm	15-130 mm
22474...	Ident. No. 015	020	025	030	035
	●	●	●	●	●

Prod. Gr. 264

ORION® Workpiece stop set

Application:

For clamping short parts on lathe chucks.

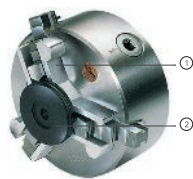
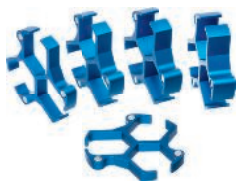
Execution:

- Fastened with 3 magnets that are built into the limit stop by simply placing on the lathe chuck body.

- Stop is coloured blue
- Contact surfaces are polished
- Material: aluminium

Delivery:

Complete set in wooden case



1 = Workpiece stop
2 = Workpiece



Workpiece stop

Workpiece stopper height	15 mm 20 mm 25 mm 30 mm 35 mm
Min. jaw width (mm)	25
Max. jaw width (mm)	55
For min./max. workpiece Ø	15-130 mm
22474...	Ident. No. 100
	Set price, € ●

Prod. Gr. 264

collet chuck DIN6343 173E, round (DIN 173)

Execution:

- hardened and ground
- clamping bridge max. 0.1 mm of the nominal diameter
- Ø 1-10 mm ≤ 20 µm
- Ø 11-30 mm ≤ 30 µm
- Ø 31-60 mm ≤ 40 µm
- Other versions and complete sets deliverable on request.
- **No. 23327:**
 - concentricity

- up to Ø 8 mm smooth bore, from Ø 8.5 mm with crosswise grooves
- **No. 23353:**
 - concentricity
 - up to Ø 8 mm smooth bore, from Ø 9 mm with crosswise grooves

Notes:

No. 23327: Ref. no. 23327010-23327420 = collet chucks with round profile, available from Ø1 - 42 mm with 0.5 mm increments.

Tips for ordering:

5-digit item no. (23327) for collet chucks with round profile

Example: Collet chucks with round profile Ø12 mm = order no. 23327120.

No. 23353: Ref. no. 23353010-420 = collet chucks with round profile, available from Ø1 - 42 mm with 0.5 mm increments.

Tips for ordering:

5-digit item no. (23353) for collet chucks with round profile

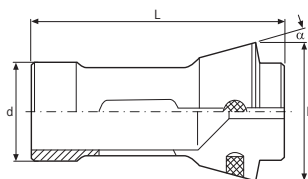
Example: collet chuck Ø 12.5 mm = order no. 23353125



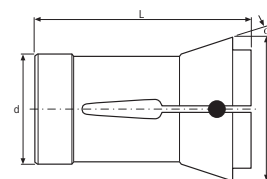
No. 23327



No. 23353



No. 23327



No. 23353

	FAHRION®		ORION®	
	Outer Ø D (mm)	Ø d (mm)	Outer Ø D (mm)	Ø d (mm)
	60	48	60	48
	60	48	60	48
	94	94	94	94
Profile shape	Round and smooth	Round with transverse grooves	Round and smooth	Round with transverse grooves
DIN	173	173	173	173
Clamping Ø (mm)	23327... Ident. No.	23327... Ident. No.	23353... Ident. No.	23353... Ident. No.
1.0	010 ○	-	010 ○	-
1.5	015 ○	-	015 ○	-
2.0	020 ○	-	020 ○	-
2.5	025 ○	-	025 ○	-
3.0	030 ○	-	030 ○	-
3.5	035 ○	-	035 ○	-
4.0	040 ○	-	040 ○	-
4.5	045 ○	-	045 ○	-
5.0	050 ○	-	050 ○	-
5.5	055 ○	-	055 ○	-
6.0	060 ○	-	060 ●	-
6.5	065 ○	-	065 ○	-
7.0	070 ○	-	070 ○	-
7.5	075 ○	-	075 ○	-
8.0	080 ○	-	080 ●	-
8.5	-	085 ○	085 ○	-
9.0	-	090 ○	-	090 ○
9.5	-	095 ○	-	095 ○
10.0	-	100 ○	-	100 ○
10.5	-	105 ○	-	105 ○
11.0	-	110 ○	-	110 ○
11.5	-	115 ○	-	115 ○
12.0	-	120 ○	-	120 ●
12.5	-	125 ○	-	125 ○
13.0	-	130 ○	-	130 ○
13.5	-	135 ○	-	135 ○
14.0	-	140 ○	-	140 ○
14.5	-	145 ○	-	145 ○
15.0	-	150 ○	-	150 ○
15.5	-	155 ○	-	155 ○
16.0	-	160 ○	-	160 ●
16.5	-	165 ○	-	165 ○
17.0	-	170 ○	-	170 ○
17.5	-	175 ○	-	175 ○
18.0	-	180 ○	-	180 ●
18.5	-	185 ○	-	185 ○
19.0	-	190 ○	-	190 ○
19.5	-	195 ○	-	195 ○
20.0	-	200 ○	-	200 ●
20.5	-	205 ○	-	205 ○
21.0	-	210 ○	-	210 ○
21.5	-	215 ○	-	215 ○
22.0	-	220 ○	-	220 ○
22.5	-	225 ○	-	225 ○
23.0	-	230 ○	-	230 ○
23.5	-	235 ○	-	235 ○
24.0	-	240 ○	-	240 ○
24.5	-	245 ○	-	245 ○
25.0	-	250 ○	-	250 ●
25.5	-	255 ○	-	255 ○
26.0	-	260 ○	-	260 ○

	FAHRION®				ORION®				
	Outer Ø D (mm)		60		60		60		
Ø d (mm)		48		48		48			
Length L (mm)		94		94		94			
Profile shape		Round and smooth		Round with transverse grooves		Round and smooth		Round with transverse grooves	
DIN		173		173		173		173	
Clamping Ø (mm)		23327... Ident. No.		23327... Ident. No.		23353... Ident. No.		23353... Ident. No.	
26.5	-	-	265	o	-	-	265	o	
27.0	-	-	270	o	-	-	270	o	
27.5	-	-	275	o	-	-	275	o	
28.0	-	-	280	o	-	-	280	o	
28.5	-	-	285	o	-	-	285	o	
29.0	-	-	290	o	-	-	290	o	
29.5	-	-	295	o	-	-	295	o	
30.0	-	-	300	o	-	-	300	o	
30.5	-	-	305	o	-	-	305	o	
31.0	-	-	310	o	-	-	310	o	
31.5	-	-	315	o	-	-	315	o	
32.0	-	-	320	o	-	-	320	o	
32.5	-	-	325	o	-	-	325	o	
33.0	-	-	330	o	-	-	330	o	
33.5	-	-	335	o	-	-	335	o	
34.0	-	-	340	o	-	-	340	o	
34.5	-	-	345	o	-	-	345	o	
35.0	-	-	350	o	-	-	350	o	
35.5	-	-	355	o	-	-	355	o	
36.0	-	-	360	o	-	-	360	o	
36.5	-	-	365	o	-	-	365	o	
37.0	-	-	370	o	-	-	370	o	
37.5	-	-	375	o	-	-	375	o	
38.0	-	-	380	o	-	-	380	o	
38.5	-	-	385	o	-	-	385	o	
39.0	-	-	390	o	-	-	390	o	
39.5	-	-	395	o	-	-	395	o	
40.0	-	-	400	o	-	-	400	o	
40.5	-	-	405	o	-	-	405	o	
41.0	-	-	410	o	-	-	410	o	
41.5	-	-	415	o	-	-	415	o	
42.0	-	-	420	o	-	-	420	o	

ORION = Prod. Gr. 2AE
FAHRION = Prod. Gr. 235

Pressure collet chuck DIN6343 173E with square profile (DIN 173)

Execution:

- hardened and ground
- clamping bridge max. 0.1 mm of the nominal diameter
- Ø 1-10 mm ≤ 20 µm
- Ø 11-30 mm ≤ 30 µm
- Ø 31-60 mm ≤ 40 µm
- Other versions and complete sets deliverable on request.
- No. 23328:** concentricity
- No. 23354:** concentricity

Notes:

No. 23328: ref. no. 23328060-23328300 = collet chucks with square profile, available from size 6 - 30 mm

Tips for ordering:

5-digit item no. (23328) for collet chucks with square profile

Example: collet chuck size 12 mm = order no. 23328120"

No. 23354: ref. no. 23354040-300 = collet chucks with square profile, available from size 4 - 30 mm

Tips for ordering:

5-digit item no. (23354) for collet chucks with square profile

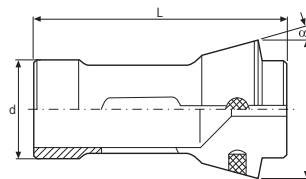
Example: collet chuck, square profile with size 17 mm = order no. 23354170



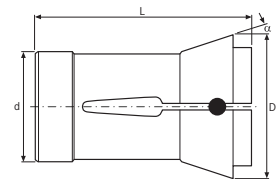
No. 23328



No. 23354



No. 23328



No. 23354

	FAHRION®				ORION®				
	Outer Ø D (mm)		60		60		60		
Ø d (mm)		48		48		48			
Length L (mm)		94		94		94			
Profile shape		Square and smooth		Square with transverse grooves		Square and smooth		Square with transverse grooves	
DIN		173		173		173		173	
Width across flats SW		23328... Ident. No.		23328... Ident. No.		23354... Ident. No.		23354... Ident. No.	
6 mm	060	o	-	-	060	o	-	-	
7 mm	070	o	-	-	070	o	-	-	
8 mm	080	o	-	-	080	o	-	-	
9 mm	090	o	-	-	090	o	-	-	
10 mm	100	o	-	-	100	o	-	-	

	FAHRION®				ORION®			
	60		60		60		60	
Outer Ø D (mm)	60		60		60		60	
Ø d (mm)	48		48		48		48	
Length L (mm)	94		94		94		94	
Profile shape	Square and smooth		Square with transverse grooves		Square and smooth		Square with transverse grooves	
DIN	173		173		173		173	
Width across flats SW	23328... Ident. No.		23328... Ident. No.		23354... Ident. No.		23354... Ident. No.	
11 mm	110	○	-	-	110	○	-	-
12 mm	120	○	-	-	120	○	-	-
13 mm	-	-	130	○	-	-	130	○
14 mm	-	-	140	○	-	-	140	○
16 mm	-	-	160	○	-	-	160	○
18 mm	-	-	180	○	-	-	180	○
20 mm	-	-	200	○	-	-	200	○
22 mm	-	-	220	○	-	-	220	○
25 mm	-	-	250	○	-	-	250	○
28 mm	-	-	280	○	-	-	280	○
30 mm	-	-	300	○	-	-	300	○
15 mm	-	-	-	-	-	-	150	○
17 mm	-	-	-	-	-	-	170	○
19 mm	-	-	-	-	-	-	190	○
24 mm	-	-	-	-	-	-	240	○
26 mm	-	-	-	-	-	-	260	○

ORION = Prod. Gr. 2AE
FAHRION = Prod. Gr. 235

Pressure collet chuck DIN6343 173E with hexagonal profile (DIN 173)

Execution:

- hardened and ground
- clamping bridge max. 0.1 mm of the nominal diameter
- Ø 1-10 mm ≤ 20 µm
- Ø 11-30 mm ≤ 30 µm
- Ø 31-60 mm ≤ 40 µm
- Other versions and complete sets deliverable on request.
- **No. 23337:** concentricity
- **No. 23353:** concentricity

Notes:

No. 23337: ref. no. 23337060-23337360 = collet chucks with square profile, available from size 6 - 36 mm

Tips for ordering:

5-digit item no. (23337) for collet chucks with hexagonal profile

Example: collet chuck size 12 mm = order no. 23337120

No. 23353: ref. no. 23353540-860 = collet chucks with square profile, available from size 4 - 36 mm

Tips for ordering:

5-digit item no. (23353) for collet chucks with square profile

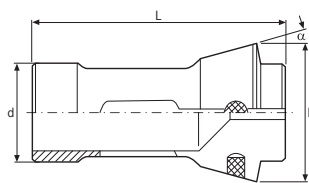
Example: Collet chuck with hexagonal profile with size 17 mm = order no. 23353670.



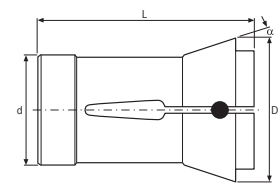
No. 23337



No. 23353



No. 23337



No. 23353

	FAHRION®				ORION®			
	60		60		60		60	
Outer Ø D (mm)	60		60		60		60	
Ø d (mm)	48		48		48		48	
Length L (mm)	94		94		94		94	
Profile shape	Hexagon and smooth		Hexagon with transverse grooves		Hexagon and smooth		Hexagon with transverse grooves	
DIN	173		173		173		173	
Width across flats SW	23337... Ident. No.		23337... Ident. No.		23353... Ident. No.		23353... Ident. No.	
6 mm	060	○	-	-	560	○	-	-
7 mm	070	○	-	-	570	○	-	-
8 mm	080	○	-	-	580	○	-	-
9 mm	090	○	-	-	590	○	-	-
10 mm	100	○	-	-	600	○	-	-
11 mm	110	○	-	-	610	○	-	-
12 mm	120	○	-	-	620	○	-	-
13 mm	-	-	130	○	-	-	630	○
14 mm	-	-	140	○	-	-	-	640
15 mm	-	-	150	○	-	-	650	○
16 mm	-	-	160	○	-	-	660	○
17 mm	-	-	170	○	-	-	670	○
19 mm	-	-	190	○	-	-	-	690
22 mm	-	-	220	○	-	-	-	-
24 mm	-	-	240	○	-	-	-	-
27 mm	-	-	270	○	-	-	-	-
30 mm	-	-	300	○	-	-	-	-
32 mm	-	-	320	○	-	-	-	-

	FAHRION®				ORION®			
Outer Ø D (mm)	60		60		60		60	
Ø d (mm)	48		48		48		48	
Length L (mm)	94		94		94		94	
Profile shape	Hexagon and smooth		Hexagon with transverse grooves		Hexagon and smooth		Hexagon with transverse grooves	
DIN	173		173		173		173	
Width across flats SW	23337... Ident. No.		23337... Ident. No.		23353... Ident. No.		23353... Ident. No.	
36 mm	-	-	360	○	-	-	-	-
4 mm	-	-	-	-	540	○	-	-
5 mm	-	-	-	-	-	-	550	○
18 mm	-	-	-	-	-	-	680	○
20 mm	-	-	-	-	-	-	700	○
21 mm	-	-	-	-	-	-	710	○

ORION = Prod. Gr. 2AE
FAHRION = Prod. Gr. 235

collet chuck DIN6343 185E, round

Execution:

- hardened and ground
- clamping bridge max. 0.1 mm of the nominal diameter
- concentricity
- Ø 1-10 mm ≤ 20 µm
- Ø 11-30 mm ≤ 30 µm
- Ø 31-60 mm ≤ 40 µm
- up to Ø 8 mm smooth bore, from Ø 9 mm with crosswise grooves
- No. 23341:** Other versions and complete sets deliverable on request.

Notes:

No. 23341: Ref. no. 23341040-23341600 = collet chucks with round profile, available from Ø4 - 60 mm with 1.0 mm increments.

Tips for ordering:

5-digit item no. (23341) for collet chucks with round profile

Example: collet chuck size 12 mm = order no. 23341120

No. 23354: Ref. no. 23354330-23354900 = collet chucks with round profile, available from Ø3 - 60 mm with 1.0 mm increments.

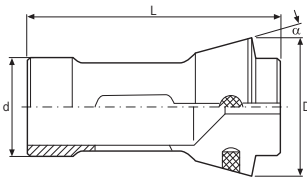
Tips for ordering:

5-digit item no. (23354) for collet chucks with round profile

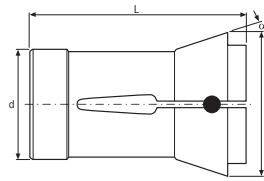
Example: collet chuck Ø 14 mm = order no. 23354440



No. 23341



No. 23341



No. 23354

	FAHRION®				ORION®			
Outer Ø D (mm)	84		84		84		84	
Ø d (mm)	66		66		66		66	
Length L (mm)	110		110		110		110	
Profile shape	Round and smooth		Round with transverse grooves		Round and smooth		Round with transverse grooves	
Clamping Ø (mm)	23341... Ident. No.		23341... Ident. No.		23354... Ident. No.		23354... Ident. No.	
4.0	040	○	-	-	340	○	-	-
5.0	050	○	-	-	350	○	-	-
6.0	060	○	-	-	360	○	-	-
7.0	070	○	-	-	370	○	-	-
8.0	080	○	-	-	380	○	-	-
9.0	-	-	090	○	-	-	390	○
10.0	-	-	100	○	-	-	400	○
11.0	-	-	110	○	-	-	410	○
12.0	-	-	120	○	-	-	420	○
13.0	-	-	130	○	-	-	430	○
14.0	-	-	140	○	-	-	440	○
15.0	-	-	150	○	-	-	450	○
16.0	-	-	160	○	-	-	460	○
17.0	-	-	170	○	-	-	470	○
18.0	-	-	180	○	-	-	480	○
19.0	-	-	190	○	-	-	490	○
20.0	-	-	200	○	-	-	500	○
21.0	-	-	210	○	-	-	510	○
22.0	-	-	220	○	-	-	520	○
23.0	-	-	230	○	-	-	530	○
24.0	-	-	240	○	-	-	540	○
25.0	-	-	250	○	-	-	550	○
26.0	-	-	260	○	-	-	560	○
27.0	-	-	270	○	-	-	570	○
28.0	-	-	280	○	-	-	580	○
29.0	-	-	290	○	-	-	590	○
30.0	-	-	300	○	-	-	600	○
31.0	-	-	310	○	-	-	610	○
32.0	-	-	320	○	-	-	620	○
33.0	-	-	330	○	-	-	630	○
34.0	-	-	340	○	-	-	640	○
35.0	-	-	350	○	-	-	650	○
36.0	-	-	360	○	-	-	660	○

	FAHRION®				ORION®			
	Outer Ø D (mm)	84	84	84	84	84	84	84
Ø d (mm)	66	66	66	66	66	66	66	66
Length L (mm)	110	110	110	110	110	110	110	110
Profile shape	Round and smooth	Round with transverse grooves	Round with transverse grooves	Round and smooth	Round and smooth	Round with transverse grooves	Round with transverse grooves	Round with transverse grooves
Clamping Ø (mm)	23341... Ident. No.	23341... Ident. No.	23341... Ident. No.	23354... Ident. No.	23354... Ident. No.	23354... Ident. No.	23354... Ident. No.	23354... Ident. No.
37.0	-	370	○	-	-	-	670	○
38.0	-	380	○	-	-	-	680	○
39.0	-	390	○	-	-	-	690	○
40.0	-	400	○	-	-	-	700	○
41.0	-	410	○	-	-	-	710	○
42.0	-	420	○	-	-	-	720	○
43.0	-	430	○	-	-	-	730	○
44.0	-	440	○	-	-	-	740	○
45.0	-	450	○	-	-	-	750	○
46.0	-	460	○	-	-	-	760	○
47.0	-	470	○	-	-	-	770	○
48.0	-	480	○	-	-	-	780	○
49.0	-	490	○	-	-	-	790	○
50.0	-	500	○	-	-	-	800	○
51.0	-	510	○	-	-	-	810	○
52.0	-	520	○	-	-	-	820	○
53.0	-	530	○	-	-	-	830	○
54.0	-	540	○	-	-	-	840	○
55.0	-	550	○	-	-	-	850	○
56.0	-	560	○	-	-	-	860	○
57.0	-	570	○	-	-	-	870	○
58.0	-	580	○	-	-	-	880	○
59.0	-	590	○	-	-	-	890	○
60.0	-	600	○	-	-	-	900	○

ORION = Prod. Gr. 2AE
FAHRION = Prod. Gr. 235

Compression collet chuck DIN 6343 185 E, square

Execution:

- Ø 1-10 mm ≤ 20 µm
- Ø 11-30 mm ≤ 30 µm
- Ø 31-60 mm ≤ 40 µm
- Other versions and complete sets deliverable on request.
- No. 23342:**
 - hardened and ground
 - clamping bridge max. 0.1 mm of the nominal diameter
 - concentricity
- No. 23355:**
 - Hardened and ground
 - Clamping bridge max. 0.1 mm of the nominal diameter
 - Concentricity
 - 23355990 is an emergency collet chuck

Delivery:

No. 23355: Ref. no. 23355640-23356000 = collet chucks with square profile, available from Ø4 - 40 mm.

Tips for ordering:

5-digit item no. (23355) for collet chucks with square profile

Example: collet chuck size 16 mm = order no. 23355760, example: collet chuck size 20 mm = order no. 23355800

Example: collet chuck size 40 mm = order no. 23356000

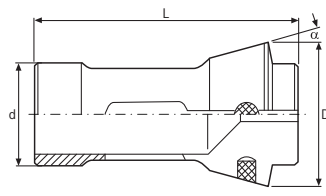
Notes:

No. 23342: ref. no. 23342070-23342400 = collet chucks with square profile, available from size 7 - 40 mm

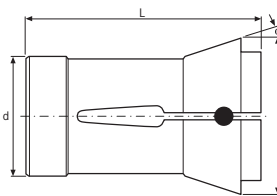
Tips for ordering:

5-digit item no. (23342) for collet chucks with square profile

Example: collet chuck size 12 mm = order no. 23342120



No. 23342



No. 23355

	FAHRION®				ORION®			
	Outer Ø D (mm)	84	84	84	84	84	84	84
Ø d (mm)	66	66	66	66	66	66	66	66
Length L (mm)	110	110	110	110	110	110	110	110
Profile shape	Square and smooth	Square with transverse grooves	Square with transverse grooves	Square and smooth	Square and smooth	Square with transverse grooves	Square with transverse grooves	Square with transverse grooves
Width across flats SW	23342... Ident. No.	23342... Ident. No.	23342... Ident. No.	23355... Ident. No.	23355... Ident. No.	23355... Ident. No.	23355... Ident. No.	23355... Ident. No.
7 mm	070	○	-	670	○	-	-	-
8 mm	080	○	-	680	○	-	-	-
9 mm	090	○	-	690	○	-	-	-
10 mm	100	○	-	700	○	-	-	-
11 mm	110	○	-	710	○	-	-	-
12 mm	120	○	-	720	○	-	-	-
13 mm	-	-	130	○	-	-	730	○
14 mm	-	-	140	○	-	-	740	○
16 mm	-	-	160	○	-	-	760	○
18 mm	-	-	180	○	-	-	-	-
20 mm	-	-	200	○	-	-	800	○
22 mm	-	-	220	○	-	-	820	○

	FAHRION®		ORION®	
	Outer Ø D (mm)	Ø d (mm)	Outer Ø D (mm)	Ø d (mm)
	84	66	84	66
	110	110	110	110
Profile shape	Square and smooth	Square with transverse grooves	Square and smooth	Square with transverse grooves
Width across flats SW	23342... Ident. No.	23342... Ident. No.	23355... Ident. No.	23355... Ident. No.
25 mm	-	250	-	850
30 mm	-	300	-	900
32 mm	-	320	-	920
36 mm	-	360	-	960
40 mm	-	400	-	-
4 mm	-	-	640	-
5 mm	-	-	650	-
6 mm	-	-	660	-
15 mm	-	-	-	750
24 mm	-	-	-	840
28 mm	-	-	-	880
-	-	-	-	990

ORION = Prod. Gr. 2AE
FAHRION = Prod. Gr. 235

draw-in collet chuck DIN 6341 355 E

Application:

No. 23348: For workpiece clamping on lathes, grinding machines and partial devices with a high degree of concentricity and retention force, preferably for plain material since there is no clamping bypass

Execution:

- **No. 23348:**
 - h8, that is to say, only the nominal dimension can be clamped
 - higher retention force than for pressure clamps,
 - but axial movement of the back collets when clamping

Delivery:

No. 23348: Ref. no. 23348015-180 = draw-in collet chucks with round profile, available from Ø1.5 - 18 mm with 0.5 mm increments.

Tips for ordering:

5-digit item no. (23348) for draw-in collet chucks with round profile

Example: draw-in collet chucks Ø10.5 mm = order no. 23348105

No. 23356: Ref. no. 23356010-180 = draw-in collet chucks with round profile, available from Ø1 - 18 mm with 0.5 mm increments.

Tips for ordering:

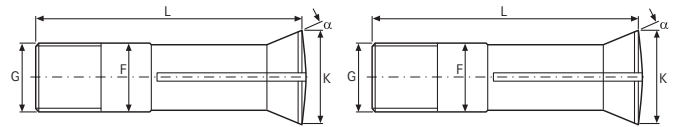
5-digit item no. (23356) for draw-in collet chucks with round profile

Example: draw-in collet chucks 10.5 mm = order no. 23356105



No. 23348

No. 23356



No. 23348

No. 23356

	ORION®		FAHRION®	
	DIN 6341 355 E	DIN 6341 355E FM845e	DIN 6341 355E	DIN 6341 355E FM845e
Outer Ø D (mm)	28	28	28	28
Ø d (mm)	20	20	20	20
Length L (mm)	117.5	117.5	117.5	117.5
Thread dimension G	SG 20 x 2	SG 20 x 2	SG 20 x 2	SG 20 x 2
Profile shape	Round and smooth	Round and smooth	Round and smooth	Round and smooth
alpha angle	17° 30'	17° 30'	17° 30'	17° 30'
Clamping Ø (mm)	23356... Ident. No.	23348... Ident. No.	23356... Ident. No.	23348... Ident. No.
1.0	010	●	-	-
1.5	015	●	015	○
2.0	020	●	020	○
2.5	025	●	025	○
3.0	030	●	030	○
3.5	035	●	035	○
4.0	040	●	040	○
4.5	045	●	045	○
5.0	050	●	050	○
5.5	055	●	055	○
6.0	060	●	060	○
6.5	065	●	065	○
7.0	070	●	070	○
7.5	075	○	075	○
8.0	080	●	080	○
8.5	085	●	085	○
9.0	090	○	090	○
9.5	095	●	095	○

	ORION®		FAHRION®	
	DIN 6341 355 E	DIN 6341 355E FM845e	DIN 6341 355 E	DIN 6341 355E FM845e
Outer Ø D (mm)	28	28	28	28
Ø d (mm)	20	20	20	20
Length L (mm)	117.5	117.5	117.5	117.5
Thread dimension G	SG 20 x 2	SG 20 x 2	SG 20 x 2	SG 20 x 2
Profile shape	Round and smooth	Round and smooth	Round and smooth	Round and smooth
alpha angle	17° 30'	17° 30'	17° 30'	17° 30'
Clamping Ø (mm)	23356... Ident. No.	23348... Ident. No.	23356... Ident. No.	23348... Ident. No.
10.0	100	●	100	○
10.5	105	○	105	○
11.0	110	●	110	○
11.5	115	○	115	○
12.0	120	●	120	○
12.5	125	○	125	○
13.0	130	○	130	○
13.5	135	○	135	○
14.0	140	○	140	○
14.5	145	○	145	○
15.0	150	●	150	○
15.5	155	●	155	○
16.0	160	●	160	○
16.5	165	●	165	○
17.0	170	○	170	○
17.5	175	○	175	○
18.0	180	●	180	○

ORION = Prod. Gr. 2AE
FAHRION = Prod. Gr. 235

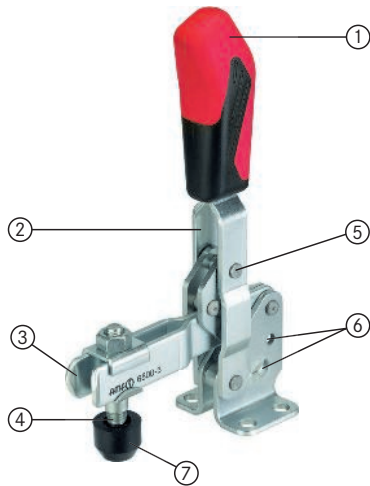


AMF quick-action clamp

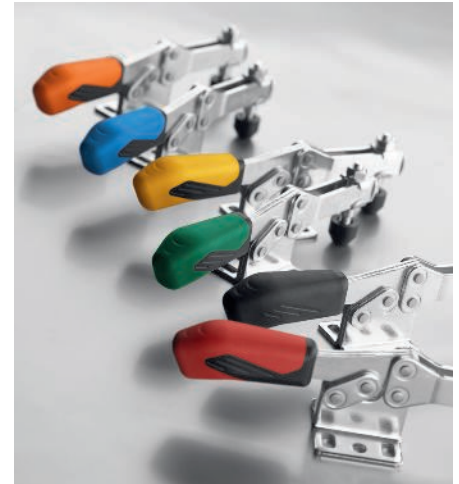
The features of our quick-action clamp at a glance

the characteristics of our quick-action clamp at a glance

- ergonomic 2-component handle
- safety clamping piece with finger protection
- protection against the loss of pressure screws
- stainless steel rivets
- removable rubber cap
- Ergonomic 2-component handle
- Safety clamping piece with finger protection
- Protection against the loss of pressure screws
- Stainless-steel rivets
- Removable rubber cap



- ① **Ergonomic 2-component handle** with a high degree of operating comfort due to large hand surface. The grippy surface made of soft components is connected with the hard base material sitting firmly on the clamp.
- ② **Safety clamp with finger protection** and integrated stop to which there is no access.
- ③ **Protection against the loss of pressure screws.** For subsequent insertion of pre-assembled pressure screws.
- ④ Pressure screw (8.8) can be quickly adjusted using the nut washer in tensioner arm.
- ⑤ **Stainless-steel rivets** in case-hardened bushings. All bearings greased, for durable, consistent functionality.
- ⑥ The opening angle can be changed by pressing in a stop pin.
- ⑦ Pressure screw with removable rubber cap.



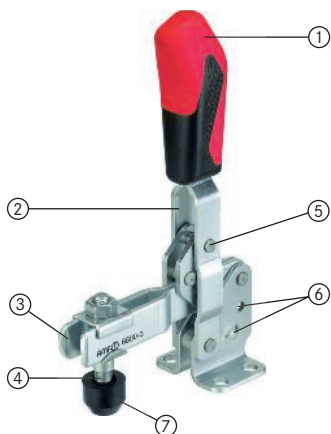
Quick-action clamp with coloured handles available on request.



AMF quick-action clamp

the characteristics of our quick-action clamp at a glance

- ergonomic 2-component handle
- safety clamping piece with finger protection
- protection against the loss of pressure screws
- stainless steel rivets
- removable rubber cap



- ① **ergonomic 2-component handle** with a high degree of operating comfort due to large hand surface. the grippy surface made of soft components is connected with the hard base material sitting firmly on the clamp.
- ② **safety clamp with finger protection** and integrated stop to which there is no access.
- ③ **protection against the loss of pressure screws.** for subsequent insertion of pre-assembled pressure screws.
- ④ pressure screw (8.8) can be quickly adjusted using the nut washer in tensioner arm.
- ⑤ **rivets made of stainless steel**, in case-hardened bushings. all bearings greased, for durable, consistent functionality.
- ⑥ the opening angle can be changed by pressing in a stop pin.
- ⑦ pressure screw with removable rubber cap



AMF variable quick-action clamp



infinitely adjustable clamping force with adjusting screw

advantages at a glance:

- variable clamping height
- clamping of different workpieces
- usable with small batch sizes
- adjustable clamping force
- ergonomic 2-component handle
- protection against loss on clamping arm



clamping force is adjustable with an adjusting screw: for sensitive materials, the clamping force can be reduced to avoid damaging the material, and high forces can be employed where they are wanted.

- significantly stronger internal mechanism than comparable competitive products – higher clamping forces
- high-quality design:
 - galvanised (not nickel-plated) – more durable
 - solid rivets instead of hollow ones – this results in higher forces

ORION® Horizontal quick action clamps

Application:

For quick clamping of workpieces.

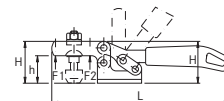
Execution:

- With open support arm and horizontal base

- Galvanised and passivated
- With red oil-resistant plastic handle
- Case-hardened and lubricated bearing bushes

Delivery:

With thrust bolt and protective cap



Size 0-1

Size	0	1	2	3	4
Hole spacing c (mm)	15.9	22	34	37	50.5
Hole spacing m (mm)	15.9	27.8	24	30	37
Hole Ø d (mm)	4.4	5.2	8.5	10.5	11
Clamping height H (mm)	10	25.4	23.5	36.5	38.1
Retention force F1 (N)	270	900	2500	2800	5000
Height H1 (mm)	18	38.1	37.5	56.5	58.1
Length L (mm)	79	142	189	279	279
26215...	Ident. No. 805	810	820	830	840

Prod. Gr. 264

ORION® Electronic drills vices

Application:
For light machining tasks.

Execution:
▪ Made from grey cast iron

- Precise clamping thanks to long flat rail guide
- Jaws with steps and vee blocks
- Horizontal and vertical vee blocks for round material in fixed jaw



Jaws width (mm)	Clamping width (mm)	Jaws height (mm)	Max. length (mm)	Body width (mm)	Body height (mm)	Chip flute width (mm)	Min. flute spacing (mm)	Max. flute spacing (mm)	Weight (kg)	28665... Ident. No.	
60	70	25	160	130	47	9	90	105	2.5	060	●
80	80	25	190	150	52	9	110	125	4	080	●
100	115	30	240	200	67	12	145	160	9	100	●
120	155	40	300	230	82	12	180	195	16	120	●
150	185	45	355	260	100	15	200	215	24	150	●

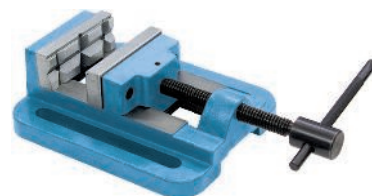
Prod. Gr. 282

ORION® drilling hand vices

Application:
Secure clamping and fixing of workpieces on drills and measuring machines.

Execution:
▪ Basic body made of grey cast iron

- Universal means of attachment thanks to clamping slots and elongated holes
- Fixed clamping jaws with vee blocks
- Both jaws with step for clamping flat workpieces
- Ref. no. 200 with 3 clamping possibilities, horizontal, vertical and lateral
- Jaws and spindle burnished



Ident. No. 063-140



Ident. No. 200

Jaws width (mm)	Clamping width (mm)	Vice width (mm)	Jaws height (mm)	Base body length (mm)	Body length (mm)	Height (mm)	Clamping flute length (mm)	Chip flute width (mm)	Weight (kg)	28660... Ident. No.	
63	65	105	25	125	125	43	53	12.5	-	063	●
80	85	142	30	142	-	64	72	14	5	085	●
100	92	150	30	150	170	65	163	14	7	100	●
120	110	176	30	176	222	63	190	14	11	120	●
140	150	220	40	220	300	85	225	14	12.5	140	●
100	93	155	30	155	185	63	45	15	-	200	●

Price/unit, €

Prod. Gr. 282

ORION precision vices, mechanical
with clamping force booster

Execution:

- clamping force, can be pre-set via grooved markings
- can be clamped horizontally, vertically or laterally
- steel body, hardened and polished on all sides
- incorporated pull-down
- bed height H: ≤ 0.01 mm

Advantage:

- accurate reproducibility of clamping force
- no change in clamping force
- no vibration during machining
- Long service life

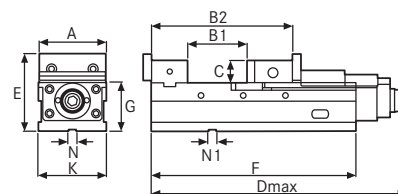
Delivery:

Adjustable clamp set, 1 piece each, matching nut and ratchet tool



A (mm)	102	125	160
B1 (mm)	0-140 mm	0-201 mm	0-295 mm
B2 (mm)	314.5	381.5	479
C (mm)	45	53	53
G (mm)	85	100	115
F (mm)	324	390	485
K (mm)	104	127	161
Max. length (mm)	428	495	605
Height E (mm)	130	153	168
N h7 (mm)	14	14	14
N1 H7 (mm)	18	18	18
Tension force (kN)	25	35	45
288 14...	Ident. No. 001	Ident. No. 002	Ident. No. 003

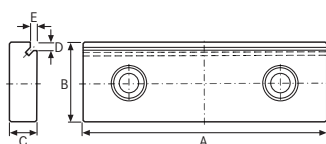
Prod. Gr. 286



ORION Clamping jaws
Accessories for 2814001-003



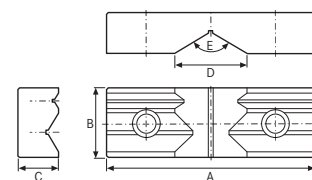
Ident. No. 010-012



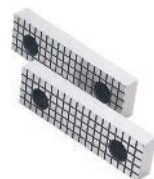
Ident. No. 010-012



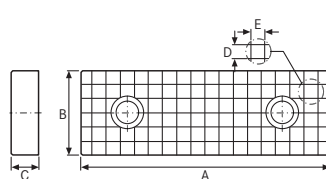
Ident. No. 020-022



Ident. No. 020-022



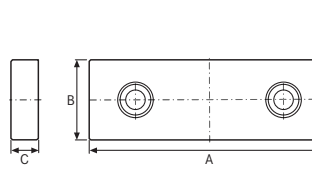
Ident. No. 030-032



Ident. No. 030-032



Ident. No. 040-042



Ident. No. 040-042

For vice with jaw width (mm)	A (mm)	B (mm)	Width (mm)	D (mm)	E (mm)	E (Degree)	Stepped jaws		Vee block jaw		Grooved jaws		Standard clamping jaws	
							288 14... Ident. No.	288 14... Ident. No.	288 14... Ident. No.	288 14... Ident. No.	288 14... Ident. No.	288 14... Ident. No.		
102	102	45	15	5	5	-	010	○	-	-	-	-	-	-
125	124.7	53	15	5	5	-	011	○	-	-	-	-	-	-
160	159.2	53	18	5	4.5	-	012	○	-	-	-	-	-	-
102	102	45	28	36.3	-	120	-	-	020	○	-	-	-	-
125	124.7	53	31	50	-	120	-	-	021	○	-	-	-	-
160	159.2	53	31	55	-	120	-	-	022	○	-	-	-	-
102	102	45	15	9	9	-	-	-	-	-	030	○	-	-
125	124.7	53	15	9	9	-	-	-	-	-	031	○	-	-
160	159.2	53	18	9	9	-	-	-	-	-	032	○	-	-
102	102	45	15	-	-	-	-	-	-	-	-	-	040	○
125	124.7	53	18	-	-	-	-	-	-	-	-	-	041	○
160	159.2	53	18	-	-	-	-	-	-	-	-	-	042	○

Prod. Gr. 286

ORION® Parallel rest sets

Application:

For parallel support of workpieces in machine vices, on machine tools or on marking-off plates.

Execution:

- Made of steel
- The different dimensions create a multitude of combination possibilities.
- Height tolerance within a 0.01 mm pair
- Hardened and polished

- In pairs, tolerance IT 5, nominal width to DIN ISO 2768-1, tolerance class m
- ref. no. 26256010 nominal dimensional tolerance H + W +/- 0.02 mm in line with (DIN ISO 2768-1 tolerance class m)
- ref. no. 26256020 nominal dimension tolerance at height 14-30 mm +/- 0.02mm, with height 32-50 mm +/- 0.03mm

Delivery:

In wooden case with 14 pairs of packing pieces.



Parallel rest length (mm)		150	150
Parallel rest width (mm)		10	10
Parallel rest height		14 mm 16 mm 18 mm 20 mm 22 mm 24 mm 26 mm 28 mm 30 mm 32 mm 35 mm 40 mm 45 mm 50 mm	14 mm 16 mm 18 mm 20 mm 22 mm 24 mm 26 mm 28 mm 30 mm 32 mm 35 mm 40 mm 45 mm 50 mm
Nominal tolerance, height 14-30 mm		+/- 0.020 mm	-
Pair tolerance		0.01 mm	0.01 mm
26256...	Ident. No.	010	020

Prod. Gr. 264

ORION® Parallel rests, single pairs

Application:

For parallel support of workpieces in machine vices, on machine tools or equipment.

Execution:

- Made of steel, hardened and ground
- Height tolerance within a 0.01 mm pair

- Remaining dimensions in accordance with DIN ISO 2768m
- Ref. no. 26256232-250, nominal height tolerance +/- 0.03 mm
- Remaining ref. no. nominal width + height tolerance +/- 0.02 mm



Length (mm)		150	150	150
Pair tolerance		0.01 mm	0.01 mm	0.01 mm
Nominal tolerance width and height		+/- 0,02 mm		
Nominal tolerance height			+/- 0,02 mm	+/- 0,02 mm
Width (mm)	Height (mm)	26256... Ident. No.	26256... Ident. No.	26256... Ident. No.
14	10	114	214	-
16	10	-	216	-
18	10	-	218	-
20	10	-	220	-
22	10	-	222	-
24	10	-	224	-
26	10	-	226	-

Prod. Gr. 264

Length (mm)		150	150	0.01 mm
Pair tolerance		0.01 mm	0.01 mm	0.01 mm
Nominal tolerance width and height		+/- 0,02 mm		
Nominal tolerance height			+/- 0,02 mm	+/- 0,02 mm
Width (mm)	Height (mm)	26256... Ident. No.	26256... Ident. No.	26256... Ident. No.
28	10	-	228	-
30	10	-	230	-
32	10	-	232	-
35	10	-	235	-
40	10	-	240	-
45	10	-	245	-
50	10	-	-	250

ORION® Parallel rest sets

Application:

For parallel support of workpieces in machine vices, on machine tools or on marking-off plates.

Execution:

- In pairs, tolerance IT 5, nominal width to DIN ISO 2768-1, tolerance class m



Composition of set

Composition of set	Width x height: 2 x 5, 2 x 10, 2 x 15, 2 x 20, 3 x 6, 3 x 11, 3 x 16, 3 x 21, 4 x 7, 4 x 12, 4 x 17, 4 x 22, 5 x 8, 5 x 23, 6 x 9, 6 x 14, 6 x 19, 6 x 24	Width x height: 8 x 11, 8 x 16, 8 x 21, 8 x 26, 8 x 31, 8 x 36, 10 x 13, 10 x 18, 10 x 23, 10 x 28, 10 x 33, 10 x 38, 12 x 15, 12 x 20, 12 x 25, 12 x 30, 12 x 35, 12 x 40, 14 x 17, 14 x 22, 14 x 27, 14 x 32, 14 x 27, 14 x 32, 14 x 37, 14 x 42	Width x height: 8 x 11, 8 x 16, 8 x 21, 8 x 26, 8 x 31, 8 x 36, 10 x 13, 10 x 18, 10 x 23, 10 x 28, 10 x 33, 10 x 38, 12 x 15, 12 x 20, 12 x 25, 12 x 30, 12 x 35, 12 x 40, 14 x 17, 14 x 22, 14 x 27, 14 x 32, 14 x 27, 14 x 32, 14 x 37, 14 x 42
	Min. set height (mm)	2	8
Max. set height (mm)	24	42	42
Parallel rest length (mm)	100	125	150
Pair tolerance	IT 5	IT 5	IT 5
26254...	Ident. No. 010	020	030

Prod. Gr. 264

ORION® ORION parallel rests, single pairs IT5

Application:

For parallel support of workpieces in machine vices, on machine tools or equipment.

Execution:

- Made of steel, hardened and ground
- Pair height tolerance IT5
- Nominal width tolerance +/-0.02 mm



Width (mm)	Height (mm)	Length (mm)		100		125		150	
		Pair tolerance	IT 5	IT 5	IT 5	IT 5	IT 5	IT 5	IT 5
5	2	100	●	-	-	-	-	-	-
10	2	101	●	-	-	-	-	-	-
15	2	102	●	-	-	-	-	-	-
20	2	103	●	-	-	-	-	-	-
6	3	104	●	-	-	-	-	-	-
11	3	105	●	-	-	-	-	-	-
16	3	106	●	-	-	-	-	-	-
21	3	107	●	-	-	-	-	-	-
7	4	108	●	-	-	-	-	-	-
12	4	109	●	-	-	-	-	-	-
17	4	110	●	-	-	-	-	-	-
22	4	111	●	-	-	-	-	-	-
8	5	112	●	-	-	-	-	-	-
13	5	113	●	-	-	-	-	-	-
18	5	114	●	-	-	-	-	-	-
23	5	115	●	-	-	-	-	-	-
9	6	116	●	-	-	-	-	-	-
14	6	117	●	-	-	-	-	-	-
19	6	118	●	-	-	-	-	-	-
24	6	119	●	-	-	-	-	-	-
11	8	-	-	150	●	200	●	-	-
16	8	-	-	151	●	201	●	-	-

Prod. Gr. 264

ORION® Angle plates for mounting

Made from grey cast iron

Application:

For attaching a workpiece perpendicular to the base on which the angle plate is standing.

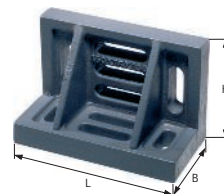
- Squareness tolerance 0.04/100 mm
- With machined clamping surfaces and reinforcement ribs

Execution:

- Made from grey cast iron
- Lightweight and sturdy design

Notes:

Other sizes on request. Delivered ex-works, postage and packaging excluded.



Length L (mm)	150	200	275	400
Width B (mm)	75	100	150	225
Height H (mm)	100	150	200	300
Weight (kg)	-	-	15	45
26260...	Ident. No. 010	020	030	040













Prod. Gr. 264











THE HIGHEST QUALITY PRODUCTS
FOR MAXIMUM EFFICIENCY.

WE HAVE WHAT IT TAKES.

For a complete range of products that meet the toughest demands, visit www.iconridge.com

Calibration	
	Calibration of measuring and test equipment
Hand-held devices	
	Vernier callipers
	Depth callipers
	Measuring tool sets
	Micrometers
	Internal micrometers
Gauges and dimensional standards	
	Gauge blocks
	Gauges
	Hole gauges
	Thread gauges
Dial gauges	
	Mechanical dial gauges
	Electronic dial gauges

Auxiliary aids for dial gauges	
	Measuring stands
	Measuring tables
Marking-off and height measuring instruments	
	Marking-off devices
	Vertical height measuring devices
Measuring aids	
	Prisms
	Concentricity test devices
	Small gauges
	Feeler gauges
	Tape rules
	Laser distance measuring instruments
	Scales and rules
	Angle measuring and setting devices
	Spirit levels and levelling devices
Magnifying lenses and technical endoscopy	
	Magnifying glasses

Hardness testing		
	Mobile hardness testing devices	
Force measurement and weighing technology		
	Spring balances	
Temperature and ambient conditions monitoring		
	Temperature and air-humidity measuring instruments	
	Infrared temperature-measuring instruments	
	Ambient monitoring measuring instruments	
Time, speed and frequency measurements, stroke, travel and quantity counters		
	Stop watches	
	Tachometer	
	Stroke, travel and piece counters	



ATORN® ORION® Pocket vernier calipers (DIN 862)
with parallax-free vernier scale reading



Application:

For measuring external, internal, step and depth dimensions.

Execution:

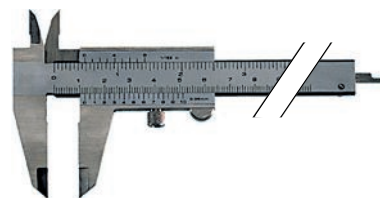
- Scale and vernier scale with anti-glare, brushed chromium-plated finish
- Measuring and guiding surfaces hardened
- **No. 31007:** With double vee block guide

Advantage:

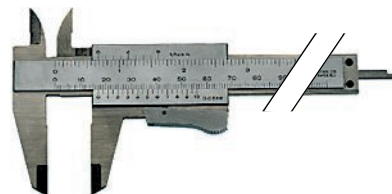
- Vernier and scale are on the same level, making it easier to read from the side
- **No. 31007:** Minimal guide play and optimum sliding properties

Delivery:

In a case



No. 31007
With double Vee block guide



No. 31004
With quick adjustment

				ATORN®	ORION®	ORION®
Min./max. length measuring range				0-150 mm	0-150 mm	0-150 mm
Type of locating				With locking screw	With locking screw	With torque clamping
Length of jaw (mm)	Vernier scale	Vernier scale (imperial)	Depth gauge rod	31007... Ident. No.	31006... Ident. No.	31004... Ident. No.
40	0.05 mm	1/128 inch	Flat	010 ●	010 ●	010 ●
Price/unit, €						

ATORN® = Prod. Gr. 3AC
ORION = Prod. Gr. 3BA

ORION® Pocket vernier calipers (DIN 862)



Application:

For measuring external, internal, step and depth dimensions.

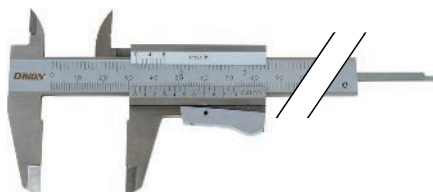
Execution:

- Scale and vernier scale with anti-glare, brushed chromium-plated finish

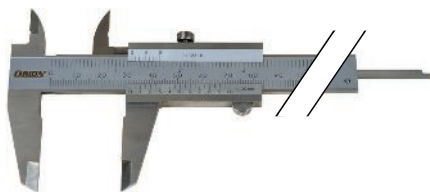
- Hardened measuring and guidance faces
- **No. 31014:** Left-handed version

Delivery:

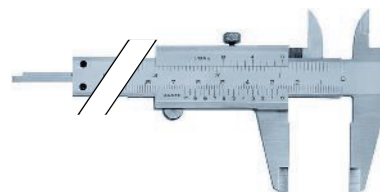
No. 31012-31013: In case
No. 31014: in case



No. 31012



No. 31013



No. 31014

				0-150 mm	0-150 mm	0-150 mm	0-300 mm
Min./max. length measuring range				0-150 mm	0-150 mm	0-150 mm	0-300 mm
Type of locating				With torque clamping	With locking screw	With locking screw	With locking screw
Length of jaw (mm)	Vernier scale	Vernier scale (imperial)	Depth gauge rod	31012... Ident. No.	31013... Ident. No.	31014... Ident. No.	31013... Ident. No.
40	0.05 mm	1/128 inch	Flat	010 ●	010 ●	010 ●	-
64	0.05 mm	1/128 inch	Flat	-	-	-	030 ●
Price/unit, €							

Prod. Gr. 3BA

Pocket vernier callipers with round scale (DIN 862)



Application:

For measuring external, internal, step and depth dimensions.

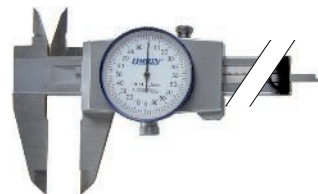
Execution:

- Depth gauge also covers the rack to protect it from chips
- Rotating dial with clamp
- **No. 31163 010-31167 810, 31169 025-31169 035:** Round scale, 32 mm diameter

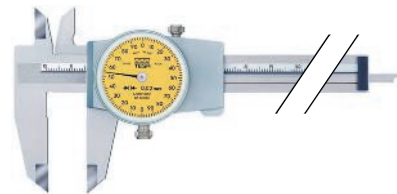
- **No. 31167-31169:** Shock-resistant measuring mechanism
- **No. 31169 010-31169 020:** Round scale, diameter 32 mm
- **No. 31169 025-31169 035:** With drive wheel

Delivery:

- No. 31163 010-31169 020:** In a case
- No. 31169 025-31169 035:** In a case



No. 31163 020



No. 31169 020-31169 035

				ORION	TESA	TESA	TESA	TESA
Min./max. length measuring range				0-150 mm	0-150 mm	0-150 mm	0-200 mm	0-300 mm
Type of locating				With locking screw	With locking screw	With locking screw	With locking screw	With locking screw
Length of jaw (mm)	Scale value (mm)	Depth gauge rod	Measurement travel of one pointer revolution (mm)	31163... Ident. No.	31167... Ident. No.	31169... Ident. No.	31169... Ident. No.	31169... Ident. No.
40	0.01	Flat	1	010 ●	-	010 ●	-	-
40	0.02	Flat	2	020 ●	-	020 ●	-	-
40	0.02	Flat	1	-	810 ●	-	-	-
50	0.02	Flat	2	-	-	-	025 ●	-
64	0.02	Flat	2	-	-	-	-	035 ●
				Price/unit, €				

ORION = Prod. Gr. 3BH
TESA = Prod. Gr. 362

i IP degrees of protection in accordance with DIN EN 60529

Degrees of protection against dust		Degrees of protection against water	
IP	first number	IP	second number
0	Not protected	0	Not protected
1	Protected against solid foreign bodies 50 mm in diameter and larger	1	Protected against dripping water
2	Protected against solid foreign bodies 12.5 mm in diameter and larger	2	Protected against dripping water where housing is inclined at angle of up to 15°
3	Protected against solid foreign bodies 2.5 mm in diameter and larger	3	Protected against spray
4	Protected against solid foreign bodies 1.0 mm in diameter and larger	4	Protected against splash water
5	Dust-protected	5	Protected against hose water
6	Dust-proof	6	Protected against heavy jets of hose water
		7	Protected against impact of temporary submersion in water
		8	Protected against impact of continual submersion in water

ORION® Electronic pocket vernier callipers (DIN 862)



Application:

Ident. No. 201, 211, 651: For measuring external, internal, step and depth dimensions.

Ident. No. 205: for measuring external, internal, step and depth dimensions.

Execution:

- ON/OFF
- **Ident. No. 201, 211, 651:** mm/inch switch-over
- **Ident. No. 201, 211-231, 651:** AUTO OFF
- **Ident. No. 201, 211-651:** Zero setting at any position
- **Ident. No. 201-211, 651:** large digits: height: 11 mm
- **Ident. No. 205:** zero setting at any position

- **Ident. No. 205, 231-601:** mm/inch changeover
- **Ident. No. 231:** With cemented carbide measuring surfaces
- **Ident. No. 231-601:** Large digits: Height: 11 mm
- **Ident. No. 401:** With metal housing
- **Ident. No. 601:** Left-handed version

Advantage:

- **Ident. No. 231:** Suitable for marking-off jobs
- **Ident. No. 401:** Scratch-resistant

Delivery:

Ident. No. 201, 211-651: In a case, with battery (1x type SR 44)
Ident. No. 205: in a case, with battery (1 x 3 V, type 2032)



Ref. no. 205



Ref. no. 401



Min./max. length measuring range	Digit increment (mm)	Length of jaw (mm)	Depth gauge rod	with 1.55 V battery	with 3 V battery
				31170... Ident. No.	31170... Ident. No.
0-100 mm	0.01	30	Flat	201	-
0-150 mm	0.01	40	Flat	211 231 401 601	205
0-300 mm	0.01	60	Flat	651	-

Price/unit, €

Prod. Gr. 3BH
 Spare battery see no. 56815 200

ORION® Electronic pocket vernier callipers (DIN 862) SOLAR



Application:

For measuring external, internal, step and depth dimensions.

- mm/inch switch-over
- Auto off
- can also be fitted with battery

Execution:

- ON
- Zero setting at any position

Delivery:

In a case



Min./max. length measuring range	Digit increment (mm)	Length of jaw (mm)	Depth gauge rod	31176... Ident. No.
0-150 mm	0.01	40	Flat	021

Price/unit, €

Prod. Gr. 3BH

ORION® Electronic pocket vernier callipers (DIN 862) IP67



Application:
For measuring external, internal, step and depth dimensions.

Execution:

- ON/OFF
- Zero setting at any position
- mm/inch switch-over

- Auto off

Advantage:

- Depth gauge: flat design with narrow probe tip, length 22 mm, for depth measurements in small boreholes from 2.5 mm diameter

Delivery:

In a case, with battery (1 x 3 V lithium type CR 2032)



Min./max. length measuring range	Digit increment (mm)	Length of jaw (mm)	Depth gauge rod	31177... Ident. No.	
0-150 mm	0.01	40	Flat	115	●
0-200 mm	0.01	50	Flat	120	●
0-300 mm	0.01	60	Flat	130	●
				Price/unit, €	

Prod. Gr. 3BH
spare battery see no. 56815 210

ORION® Depth gauge stop For pocket vernier callipers up to 150 mm

Application:
For increasing the support surface.

31180...

Ident. No.	031
Price/unit, €	●

Prod. Gr. 3BB



ORION® Workshop vernier callipers (DIN 862)



Application:
For measuring external and internal dimensions.

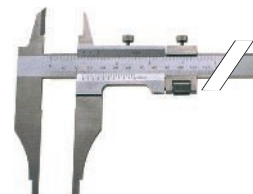
Execution:

- Vernier scale and scale with anti-glare, brushed chromium-plated finish

- 2 graduations: mm/inch
- No. 31080: With fine adjustment

Delivery:

In a case



No. 31080

Min./max. length measuring range		0-300 mm	0-500 mm	0-800 mm	0-1000 mm
Length of jaw (mm)		90	150	150	150
Inner measurement scales (mm)		10	20	20	20
Vernier scale		0.05 mm	0.05 mm	0.05 mm	0.05 mm
31079...	Without fine adjustment	Ident. No. 003	Ident. No. 005	Ident. No. 008	Ident. No. 010
		Price/unit, € ●	Price/unit, € ●	Price/unit, € ●	Price/unit, € ●
31080...	With fine adjustment	Ident. No. 003	Ident. No. 005	Ident. No. 008	Ident. No. 010
		Price/unit, € ●	Price/unit, € ●	Price/unit, € ●	Price/unit, € ●

Prod. Gr. 3BA

ORION® Electronic workshop vernier callipers (DIN 862)



Application:
For measuring external and internal dimensions.

Execution:

- ON/OFF

- Zero setting at any position
- mm/inch switch-over
- Auto off

Delivery:

In a case, with battery (1 x 3 V lithium type CR 2032)



Min./max. length measuring range	0-300 mm
Length of jaw (mm)	90
Digit increment (mm)	0.01
Inner measurement scales (mm)	10
31145...	Ident. No. 130
	Price/unit, € ●

Prod. Gr. 3BH
Spare battery see no. 56815 210

ORION® Electronic workshop vernier callipers
in lightweight design



Application:

Ident. No. 103-108: For measuring external and internal dimensions.

Ident. No. 510-530: for measuring external and internal dimensions.

Execution:

- ON/OFF
- mm/inch switch-over
- **Ident. No. 103-108:**
 - Zero setting at any position
 - With adjustable and replaceable measuring arms
 - Stainless steel measuring arms
- **Ident. No. 510-530:**
 - zero setting at any position
 - with adjustable and replaceable measuring arms

- stainless steel measuring arms

Advantage:

- **Ident. No. 103-108:**
 - Both measuring arms can be moved
 - Internal double vee-block guide for optimum guidance and slide properties
- **Ident. No. 510-530:**
 - both measuring arms can be moved
 - internal double vee block guide for optimum guidance and slide properties

Delivery:

- **Ident. No. 103-108:** In a case, with battery (1 x type SR 44 1.55 V)
- **Ident. No. 510-530:** in a wooden case, with battery



Ident. No. 103-108



Ref. no. 510

Min./max. length measuring range	0-300 mm	0-500 mm	0-800 mm	0-1000 mm	0-1500 mm	0-2000 mm	0-2500 mm	0-3000 mm
Length of jaw (mm)	90	90	90	150	150	150	150	150
Digit increment (mm)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Weight (kg)	0.5	0.6	0.75	1.8	2.2	2.6	3	3.4
Inner measurement scales (mm)	10	10	10	10	10	10	10	10
Error limit (mm)	0.04	0.05	0.06	0.06	0.10	0.13	0.20	0.25
31115...	Ident. No. 103	Ident. No. 105	Ident. No. 108	Ident. No. 510	Ident. No. 515	Ident. No. 520	Ident. No. 525	Ident. No. 530
Price/unit, €	●	●	●	●	●	○	○	○

Prod. Gr. 3BH

ORION® Electronic workshop vernier callipers
IP66



Application:

For measuring external and internal dimensions.

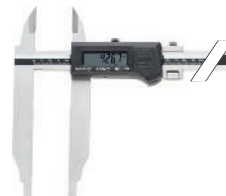
Execution:

- ON/OFF

- Zero setting at any position
- mm/inch switch-over
- Auto off

Delivery:

- In a case, with battery (1 x 3 V lithium type CR 2032)



Min./max. length measuring range	0-300 mm	0-500 mm	0-800 mm	0-1000 mm	0-1500 mm
Length of jaw (mm)	90	150	150	150	200
Digit increment (mm)	0.01	0.01	0.01	0.01	0.01
Inner measurement scales (mm)	10	20	20	20	20
Error limit (mm)	0.03	0.04	0.05	0.06	0.06
31147...	Ident. No. 035	Ident. No. 055	Ident. No. 085	Ident. No. 105	Ident. No. 155
Price/unit, €	●	●	●	●	●

Prod. Gr. 3BH

Spare battery see no. 56815 210

ORION® Depth callipers (DIN 862)**Application:**

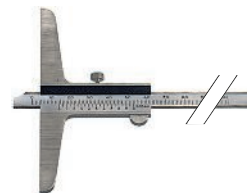
For measuring, e. g. bore depths, shoulders on workpieces etc.

- Rails manufactured from one piece
- Graduation on front

Execution:

- Vernier scale and scale with anti-glare, brushed chromium plated finish

Delivery:
In box



Min./max. length measuring range	0-150 mm	0-200 mm	0-300 mm
Vernier scale	0.05 mm	0.05 mm	0.05 mm
Bridge length x bridge width	100 x 8.5 mm	100 x 8.5 mm	100 x 8.5 mm
31240...	Ident. No. 015	020	030
	Price/unit, €	•	•

Prod. Gr. 3BB

ORION® Electronic depth calliper (DIN 862)**Application:**

For measuring, e. g. bore depths, shoulders on workpieces etc.

- mm/inch switch-over
- Auto off
- ABS function

Execution:

- ON/OFF
- Zero setting at any position

Delivery:
in a plastic case, with battery (1 x type SR44)



Ident. No. 115

Min./max. length measuring range	0-150 mm	0-200 mm	0-300 mm	0-500 mm
Digit increment (mm)	0.01	0.01	0.01	0.01
Bridge length x bridge width	80 x 7 mm	100 x 7 mm	150 x 7 mm	150 x 9 mm
31295...	Ident. No. 115	120	130	150
	Price/unit, €	•	•	•

Prod. Gr. 3BI

ORION® Electronic depth callipers (DIN 862)
IP67**Application:**

For measuring, e. g. bore depths, shoulders on workpieces etc.

- Zero setting at any position
- mm/inch switch-over
- Auto off

Execution:

- ON/OFF

Delivery:
In plastic case with battery (1 x 3 V lithium type CR2032)



Ident. No. 115

Min./max. length measuring range	0-150 mm	0-300 mm
Digit increment (mm)	0.01	0.01
Bridge length x bridge width	100 x 7 mm	150 x 7 mm
31298...	Ident. No. 115	130
	Price/unit, €	•

Prod. Gr. 3BI

Spare battery see no. 56815 210

ORION® Electronic depth calliper

Lightweight design incl. 3 measuring bridges

**Application:**

For measuring, e. g. hole depths, distances on workpieces etc.

Execution:

- ON/OFF
- Zero setting at any position
- mm/inch switch-over
- **Ident. No. 203–208:** Measuring bridges 150/300/450 mm
- **Ident. No. 302–310:** Measuring bridges, 150/350 mm

Advantage:

- Internal double vee-block guide for optimum guidance and slide properties
- Replaceable blade tips M2.5

Delivery:

Ident. No. 203–208: In a case, includes double-hook gauge slide, gauge slide with ball, with battery (1 x type SR 44, 1.55 V)

Ident. No. 302–310: In a case, gauge slides with ball, plate, with battery (1 x type SR 44, 1.55 V)



Min./max. length measuring range	0-300 mm	0-500 mm	0-800 mm	0-200 mm	0-300 mm	0-500 mm	0-800 mm	0-950 mm
Digit increment (mm)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Bridge length x bridge width	150 x 13 mm	150 x 13 mm	150 x 13 mm	150 x 16 mm	150 x 16 mm	150 x 16 mm	150 x 16 mm	150 x 16 mm
Depth gauge rod width (mm)	-	-	-	4	6	6	6	6
Error limit (mm)	0.04	0.05	0.06	0.03	0.04	0.05	0.06	0.06
31115...	Ident. No. 203	Ident. No. 205	Ident. No. 208	Ident. No. 302	Ident. No. 303	Ident. No. 305	Ident. No. 308	Ident. No. 310
	Price/unit, € ●	Price/unit, € ●	Price/unit, € ○	Price/unit, € ●	Price/unit, € ●	Price/unit, € ●	Price/unit, € ○	Price/unit, € ○

Prod. Gr. 3BI

ORION® Small electronic depth callipers (DIN 862)

**Application:**

For measuring depths in small boreholes and in restricted areas.

Execution:

- ON
- Zero setting at any position

- mm/inch changeover
- Auto off
- Overall length 150 mm

Delivery:

In a case, with battery (1 x 3 V, type CR 2032)



Min./max. length measuring range	0-25 mm
Digit increment (mm)	0.01
Bridge length x bridge width	60 x 6 mm
Depth gauge rod width (mm)	2.4
31308...	Ident. No. 012
	Price/unit, € ●

Prod. Gr. 3BI

ORION® Measuring instrument set 13-piece

Delivery:

1 Pocket vernier callipers 150 mm	1 Scale 300 mm
1 Micrometer 0-25 mm	1 Straight edge 100 mm
1 Depth callipers 150 mm	1 Try square 150 x 100 mm
1 Spring dividers 175 mm	1 Straight edge 50 x 40 mm
1 Marking gauge 200 mm	1 Protractor 120 x 150 mm
1 Radius gauges R 1-7.5 and R 7.5-15 mm	1 Scriber 160 mm



38170...

Ident. No.	013
Price/unit, €	●

Prod. Gr. 3AF

ORION® Micrometers (DIN 863)



Application:

For measuring e. g. shaft diameters, external dimensions on workpieces etc.

Execution:

- Scale with anti-glare, brushed chromium plated finish
- Carbide measuring faces

- Friction coupling for consistent, repeatable measuring force
- Ident. No. 005-175:** Steel bracket, brushed chromium-plated
- Ident. No. 200-275:** Cast iron bracket, painted, with weight-reducing bores

Delivery:

Ident. No. 005: In case

Ident. No. 025-275: In case with setting gauges



Min./max. length measuring range	0-25 mm	25-50 mm	50-75 mm	75-100 mm	100-125 mm	125-150 mm	150-175 mm	175-200 mm
Vernier scale	0.01 mm	0.01 mm	0.01 mm	0.01 mm	0.01 mm	0.01 mm	0.01 mm	0.01 mm
Measuring surface Ø (mm)	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Measuring spindle increments (mm)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
31330...	Ident. No. 005	Ident. No. 025	Ident. No. 050	Ident. No. 075	Ident. No. 100	Ident. No. 125	Ident. No. 150	Ident. No. 175
	Price/unit, € ●	Price/unit, € ●	Price/unit, € ●	Price/unit, € ●	Price/unit, € ●	Price/unit, € ●	Price/unit, € ●	Price/unit, € ●

Min./max. length measuring range	200-225 mm	225-250 mm	250-275 mm	275-300 mm
Vernier scale	0.01 mm	0.01 mm	0.01 mm	0.01 mm
Measuring surface Ø (mm)	6.5	6.5	6.5	6.5
Measuring spindle increments (mm)	0.5	0.5	0.5	0.5
31330...	Ident. No. 200	Ident. No. 225	Ident. No. 250	Ident. No. 275
	Price/unit, € ●	Price/unit, € ●	Price/unit, € ●	Price/unit, € ●

Prod. Gr. 3BC

ORION® Micrometer sets 0-150 mm (DIN 863)



Min./max. length measuring range	0-100 mm	0-150 mm
Measuring spindle increments (mm)	0.5	0.5
Measuring surface Ø (mm)	6.5	6.5
Vernier scale	0.01 mm	0.01 mm
31331...	Ident. No. 100	Ident. No. 150
	Set price, € ●	Set price, € ●

Prod. Gr. 3BC



ORION® Micrometers with direct reading (DIN 863)



Application:

For measuring e. g. shaft diameters, external dimensions on workpieces etc.

Execution:

- Carbide measuring faces
- Friction coupling for consistent, repeatable measuring force

Min./max. length measuring range	0-25 mm	25-50 mm	50-75 mm	75-100 mm
Vernier scale	0.01 mm	0.01 mm	0.01 mm	0.01 mm
Measuring surface Ø (mm)	8	8	8	8
Measuring spindle increments (mm)	1	1	1	1
31348...	Ident. No. 005	Ident. No. 025	Ident. No. 050	Ident. No. 075
	Price/unit, €			

Prod. Gr. 3BC



ORION® Micrometers with direct reading (DIN 863) In a 0-100-mm set



Min./max. length measuring range	0-100 mm
Measuring spindle increments (mm)	1
Measuring surface Ø (mm)	8
Vernier scale	0.01 mm
31348...	Ident. No. 400
	Set price, €

Prod. Gr. 3BC



ORION® Micrometers (DIN 863) 6 exchangeable anvils with 25-mm increment



Application:

For measuring e. g. shaft diameters, external dimensions on workpieces etc.

Execution:

- Scale with anti-glare, brushed chromium plated finish
- Carbide measuring faces
- Friction coupling for consistent, repeatable measuring force

- **Ident. No. 015:** Including 25, 50, 75, 100, 125 mm setting gauges
- **Ident. No. 030:** Including setting gauges 150, 175, 200, 225, 250, 275 mm

Advantage:

- Measuring spindle increment: 1 mm (direct 1/100 reading for prevention of reading errors, no need to add the 0.5 mm value)

Delivery:

In case with setting gauges



Min./max. length measuring range	0-150 mm	150-300 mm
Vernier scale	0.01 mm	0.01 mm
Measuring surface Ø (mm)	8	8
Measuring spindle increments (mm)	1	1
31344...	Ident. No. 015	Ident. No. 030
	Set price, €	

Prod. Gr. 3BC

ORION® Electronic micrometer (DIN 863)



Application:

For measuring e. g. shaft diameters, external dimensions on workpieces etc.

- ON/OFF
- Zero setting at any position
- mm/inch switch-over

Execution:

- Carbide measuring faces
- Advanced friction coupling for consistent, repeatable measuring force

Delivery:

In a case, with battery (1 x type SR 44, 1.55 V), 1 setting gauge from size 25–50 mm



Min./max. length measuring range	0-25 mm	25-50 mm	50-75 mm	75-100 mm
Digit increment (mm)	0.001	0.001	0.001	0.001
Measuring surface Ø (mm)	6.5	6.5	6.5	6.5
Measuring spindle increments (mm)	0.5	0.5	0.5	0.5
31406...	Ident. No. 005	Ident. No. 025	Ident. No. 050	Ident. No. 075
	Price/unit, €			

Prod. Gr. 3BJ

ORION® Electronic micrometer set (DIN 863) 0-100 mm



Min./max. length measuring range	0-100 mm
Digit increment (mm)	0.001
Measuring surface Ø (mm)	6.5
Measuring spindle increments (mm)	0.5
31406...	Ident. No. 400
	Set price, €

Prod. Gr. 3BJ



ORION® Setting gauge for micrometers Up to 950 mm



Application:

For adjusting micrometers.

- Measuring faces hardened and lapped

Execution:

- Measuring faces planar on both sides
- Manufacturing tolerance according to DIN 863 (js2)

Delivery:

Up to 275 mm with calibration certificate from accredited laboratory, factory calibration certificate from 300 mm, indicating traceability to DKD/PTB standards.



Length (mm)	25	50	75	100	125	150	175	200
Ø (mm)	7	7	7	8	8	8	8	8
31404...	Ident. No. 002	Ident. No. 005	Ident. No. 007	Ident. No. 010	Ident. No. 012	Ident. No. 015	Ident. No. 017	Ident. No. 020
	Price/unit, €							
Length (mm)	225	250	275					
Ø (mm)	8	8	8					
31404...	Ident. No. 022	Ident. No. 025	Ident. No. 027					
	Price/unit, €							

Prod. Gr. 3BC

Other sizes available on request

Measuring instrument holder

Application:

For mounting measuring instruments, e.g. micrometers, to keep both hands free while measuring.

- For micrometers with measuring ranges up to 300 mm
- Heavy cast iron stand for stable positioning

Execution:

- Clamping element with adjustable angle

Technical data:

- Max. clamping width: 16 mm



No. 31415



No. 31416

TESA	31415...	Ident. No.	010
		Price/unit, €	•
ORION	31416...	Ident. No.	020
		Price/unit, €	•

ORION = Prod. Gr. 3BC
TESA = Prod. Gr. 362

ORION® Measuring force testing system for micrometers

Application:

For testing the measuring force between micrometer measuring faces (up to Ø 8 mm).

- 3 screw-on extensions for micrometers up to measuring range 100 mm

Execution:

- Force measuring cell for micrometers
- Extensions for micrometers up to 100 mm

Delivery:

In a case

Technical data:

- Min./max. force of measuring range: 5-10 N



31417...	Measuring force test system	Ident. No.	100
		Set price, €	•

Prod. Gr. 3BC

ORION® Plane-parallel test glasses sets

For measuring range 0-25 mm

Application:

For testing the flatness and parallelism of 0-25 mm micrometer measuring faces.

Delivery:

In a case

31419...	Plane-parallel test glasses	Ident. No.	100
		Set price, €	•

Prod. Gr. 3BC



ORION® Micrometer (DIN 863)

small measuring faces



Application:

For measuring narrow external recesses and grooves.

- Carbide-tipped measuring faces
- Friction coupling for consistent, repeatable measuring force

Execution:

- Scale with anti-glare, brushed chromium-plated finish

Delivery:

In case



Min./max. length measuring range	0-25 mm	25-50 mm	50-75 mm	75-100 mm
Vernier scale	0.01 mm	0.01 mm	0.01 mm	0.01 mm
Measuring surface Ø (mm)	2	2	2	2
Measuring surface depth (mm)	5	5	5	5
Measuring spindle increments (mm)	0.5	0.5	0.5	0.5
31464...	Ident. No. Price/unit, €	105 ●	125 ●	150 ●
		175 ●		

Prod. Gr. 3BC

ORION® Micrometer (DIN 863)
with disc-shaped measuring faces



Application:

For measuring tooth span (Wk) on cogs as of module 0.5, for recesses, groove distances etc.

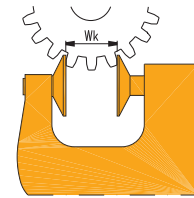
Execution:

- Measuring faces made of hardened steel

- Friction coupling for consistent, repeatable measuring force

Delivery:

In a case



Min./max. length measuring range	0-25 mm	25-50 mm	50-75 mm	75-100 mm
Vernier scale	0.01 mm	0.01 mm	0.01 mm	0.01 mm
Measuring surface Ø (mm)	20	20	20	20
Measuring spindle increments (mm)	0.5	0.5	0.5	0.5
31531...	Ident. No. Price/unit, €	005 ●	025 ●	050 ●
				075 ●

Prod. Gr. 3BC

ORION® Electronic micrometer (DIN 863)
with disc-shaped measuring faces



Application:

For measuring tooth span (Wk) on cogs as of module 0.5, for recesses, groove distances etc.

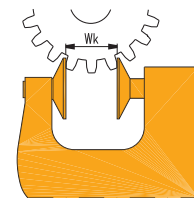
Execution:

- Measuring faces made of hardened steel
- Advanced friction coupling for consistent, repeatable measuring force

- ON/OFF
- Zero setting at any position
- mm/inch switch-over
- ABS function

Delivery:

In a case, with battery (1 x 1.5 V type SR44)



Min./max. length measuring range	0-25 mm	25-50 mm	50-75 mm	75-100 mm
Digit increment (mm)	0.001	0.001	0.001	0.001
Measuring surface Ø (mm)	20	20	20	20
Measuring spindle increments (mm)	0.5	0.5	0.5	0.5
31610...	Ident. No. Price/unit, €	005 ●	025 ●	050 ●
				075 ●

Prod. Gr. 3BJ

ORION® Electronic universal micrometer (DIN 863)

7 interchangeable gauge slide pairs



Application:
For measuring various external dimensions.

Execution:

- Measuring faces made of hardened steel
- Advanced friction coupling for consistent, repeatable measuring force

- ON/OFF
- Zero setting at any position
- mm/inch switch-over
- ABS function

Delivery:

In a case, with battery (1 x 1.5 V type SR44)



Min./max. length measuring range	0-25 mm	25-50 mm	50-75 mm	75-100 mm
Digit increment (mm)	0.001	0.001	0.001	0.001
Measuring surface Ø (mm)	8	8	8	8
Measuring spindle increments (mm)	0.5	0.5	0.5	0.5
31620...	005	025	050	075
Ident. No.				
Price/unit, €	●	●	●	●

Prod. Gr. 3BC

Prod. Gr. 362

ORION® Micrometer heads

Application:

For integration in measuring and pre-adjustment devices and for use as setting and control elements in machine tools.

- anti-glare, brushed chromium-plated measuring drum

Technical data:

- Digit increment: 0.01 mm
- Measuring spindle increments: 0.5 mm



Ident. No. 013

Execution:

- hardened spindle

Min./max. length measuring range	0-6.5 mm	0-13 mm	0-25 mm
Shaft Ø (mm)	6	9.5	9.5
31450...	006	013	025
Ident. No.			
Price/unit, €	●	●	●

Prod. Gr. 3BB

ORION® Depth micrometer (DIN 863)

Application:

For measuring bore depths and shoulders.

- Steel measuring needles hardened and lapped
- Measuring range per measuring needle: 25 mm
- Advanced friction coupling

Execution:

- Scale with anti-glare, brushed chromium plated finish

Delivery:

In a case

Min./max. length measuring range	0-100 mm	0-150 mm
Digit increment (mm)	0.01	0.01
Bridge length (mm)	102	102
Bridge width (mm)	17	17
Measuring surface Ø (mm)	4.5	4.5
Measuring spindle increments (mm)	0.5	0.5
Spindle clamping	Yes	Yes
Number of measurement needles (PCS)	4	6
31630...	100	150
Ident. No.		
Price/unit, €	●	●

Prod. Gr. 3BB



ORION® Electronic depth micrometer (DIN 863)

Application:

For measuring bore depths and shoulders.

Execution:

- ON/OFF
- Steel measuring needles hardened and lapped

- Measuring range per measuring needle: 25 mm
- Advanced friction coupling
- Zero setting at any position
- mm/inch switch-over

Delivery:

In a case, with battery (1 x 1.5 V type SR44)



Min./max. length measuring range	0-100 mm
Digit increment (mm)	0.001
Bridge length (mm)	100
Bridge width (mm)	16
Measuring surface Ø (mm)	4.5
Measuring spindle increments (mm)	0.5
Spindle clamping	Yes
Number of measurement needles (PCS)	4
31633...	Ident. No. 100
	Price/unit, €

Prod. Gr. 3BB

ORION® Internal micrometer (DIN 863) Dual measuring spouts

Application:

For measuring e.g. bores during turning, milling and grinding processes.

Execution:

- Scale with anti-glare, brushed chromium plated finish

- Measuring faces made of hardened steel
- Friction coupling for consistent, repeatable measuring force
- Internal double-sided scale sleeve

Delivery:

In case with setting ring, diameter 30 mm



Min./max. length measuring range	5-55 mm
Vernier scale	0.01 mm
Measuring spindle increments (mm)	0.5
31640...	Ident. No. 010
	Price/unit, €

Prod. Gr. 3BB

ORION® Internal micrometers (DIN 863)



Application:

Ident. No. 006–010: For measuring through-bores and short centring shoulders.

Ident. No. 012–088: For measuring through holes and blind bores (from diameter 12.5 mm) and short centring shoulders.

- Carbide measuring faces
- Friction coupling for consistent, repeatable measuring force

Delivery:

Single device with setting ring and measuring depth extension in a case



Execution:

- Scale with anti-glare, brushed chromium plated finish

Min./max. length measuring range	6-8 mm	8-10 mm	10-12 mm	12-16 mm	16-20 mm	20-25 mm	25-30 mm	30-40 mm
Error limit (µm)	4	4	4	4	4	4	4	4
Vernier scale	0.005 mm	0.005 mm	0.005 mm	0.005 mm	0.005 mm	0.005 mm	0.005 mm	0.005 mm
Measuring depth (mm)	54	54	54	80	80	90	90	97
Measuring spindle increments (mm)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
31910...	Ident. No. 006	Ident. No. 008	Ident. No. 010	Ident. No. 012	Ident. No. 016	Ident. No. 020	Ident. No. 025	Ident. No. 030
	Price/unit, €	Price/unit, €	Price/unit, €	Price/unit, €	Price/unit, €	Price/unit, €	Price/unit, €	Price/unit, €

Min./max. length measuring range	40-50 mm	50-63 mm	62-75 mm	75-88 mm	87-100 mm
Error limit (µm)	5	5	5	5	5
Vernier scale	0.005 mm	0.005 mm	0.005 mm	0.005 mm	0.005 mm
Measuring depth (mm)	97	114	114	114	114
Measuring spindle increments (mm)	0.5	0.5	0.5	0.5	0.5
31910...	Ident. No. 040	Ident. No. 050	Ident. No. 062	Ident. No. 075	Ident. No. 088
	Price/unit, €	Price/unit, €	Price/unit, €	Price/unit, €	Price/unit, €

Prod. Gr. 3BB

ORION® Internal micrometer sets (DIN 863)



	Min./max. length measuring range	Digit increment (mm)	Measuring depth (mm)	Error limit (µm)	Ident. No.	Set price, €
31910...	6-12 mm	0.005	100	4		500



ARE YOU LOOKING FOR PRODUCTS THAT MEET THE TOUGHEST DEMANDS?

WE HAVE WHAT IT TAKES.

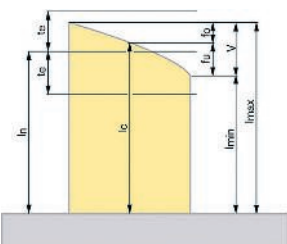
For a complete range of products that meet the toughest demands, visit www.iconridge.com



Gauge blocks

The parallel gauge blocks according to DIN EN ISO 3650 will be produced in various tolerance classes that can roughly be assigned to the following application groups:

Calibration class K	Reference normal gauge blocks are predominantly used for gauge block tests with gauge block testers in the calibration laboratory, together with a DKD calibration certificate.
Tolerance class 0	Workshop and normal gauge in calibration laboratory or in air conditioned measuring room for setting or calibration of gauges as well as measuring instruments.
Tolerance class 1	Most often used working standard for checking gauges and adjusting measuring instruments. Used in measuring rooms and on production test stations.
Tolerance class 2	Gauge blocks of this class are mostly used as a normal gauge on test stations in production areas, for setting and calibrating measuring devices as well as for setting and testing tools, appliances and machines.



Nominal measuring range	Tolerance class 0		Tolerance class 1		Tolerance class 2		
	Limit allowances for length from the nominal dimensions at any point	Tolerance for the deviation span	Limit allowances for length from the nominal dimensions at any point	Tolerance for the deviation span	Limit allowances for length from the nominal dimensions at any point	Tolerance for the deviation span	
	$\pm te$	tv	$\pm te$	tv	$\pm te$	tv	
in mm	μm	μm	μm	μm	μm	μm	
Above							
Until							
-	10	0.12	0.10	0.20	0.16	0.45	0.30
10	25	0.14	0.10	0.30	0.16	0.60	0.30
25	50	0.20	0.10	0.40	0.18	0.80	0.30
50	75	0.25	0.12	0.50	0.18	1.00	0.35
75	100	0.30	0.12	0.60	0.20	1.20	0.35
100	150	0.40	0.14	0.80	0.20	1.60	0.40
150	200	0.50	0.16	1.00	0.25	2.00	0.40
200	250	0.60	0.16	1.20	0.25	2.40	0.45
250	300	0.70	0.18	1.40	0.25	2.80	0.50
300	400	0.90	0.20	1.80	0.30	3.60	0.50
400	500	1.10	0.25	2.20	0.35	4.40	0.60
500	600	1.30	0.25	2.60	0.40	5.00	0.70
600	700	1.50	0.30	3.00	0.45	6.00	0.70
700	800	1.70	0.30	3.40	0.50	6.50	0.80
800	900	1.90	0.35	3.80	0.50	7.50	0.90
900	1000	2.00	0.40	4.20	0.60	8.00	1.00

Property	Ceramic	Cemented carbide	steel
Length extension coefficient approx.	9.5 x 10 E-6/C	4.23 x 10 E-6/C	11.5 x 10 E-6/C
Thermal conductivity	Very low	Low	High
Wear resistance	Excellent	Good	Less good
Thrust properties	Acceptable	Excellent	Excellent
Geometric accuracy	Excellent	Excellent	Acceptable if treated correctly
Corrosion resistance	Excellent	Good	Less good
Mechanical strength	Good	Good	Very good

ORION® Steel gauge block sets (ISO 3650)**Application:**

For testing and calibrating measuring instruments and test equipment.

- Hardened
- Hand-lapped
- Gauge blocks are marked with an identification number

Execution:

- Made from high-quality, aged special steel

Delivery:

In wooden case



No. 32052-32053

Number of pieces in assortment/set (PCS)	32	47	87	103
Nominal dimension in assortment	1.005 mm, 1.01-1.09 mm, increasing by 0.1 mm, 1-1.9 mm, increasing by 0.1 mm, 1-9 mm, increasing by 1 mm, 10-30 mm, increasing by 10 mm, 50 mm	1.005 mm, 1.01-1.20 mm, increasing by 0.01 mm, 1.3-1.9 mm, increasing by 0.1 mm, 10-100 mm, increasing by 10 mm, 1-9 mm, increasing by 1 mm	0.5-9.5 mm, increasing by 0.5 mm, 1.001-1.009 mm, increasing by 0.001 mm, 1.01-1.49 mm, increasing by 0.01 mm, 10-100 mm, increasing by 10 mm	1.005 mm, 1.01-1.49 mm, increasing by 0.01 mm, 0.5-24.5 mm, increasing by 0.5 mm, 25-100 mm, increasing by 25 mm
Material	Gauge steel		Gauge steel	
Tolerance class	32050... Ident. No.		32051... Ident. No.	
0	006	006	006	006
1	010	010	010	010
2	020	020	020	020

Set price, €

Prod. Gr. 321

ORION® Steel gauge block sets (ISO 3650)
Long version**Application:**

For testing and calibrating measuring instruments and test equipment.

- Hand-lapped
- Gauge blocks are marked with an identification number

Execution:

- Made from high-quality, aged special steel
- Hardened

Delivery:

in high-quality wooden case, with factory calibration certificate (DAKKS on request)



Tolerance class	Number of pieces in assortment/set (PCS)	Nominal dimension in assortment	Material	Ident. No.	Set price, €
					1
32112...	8	125 mm, 150 mm, 175 mm, 200 mm, 250 mm, 300 mm, 400 mm, 500 mm	Gauge steel	Ident. No. Set price, €	010 ○

Prod. Gr. 321

ORION® Steel gauge block sets (ISO 3650)
 For calibrating and testing vernier callipers and scribers

Application:

For the specific testing and calibration of vernier callipers and scribers.

Execution:

- Made from high-quality, aged special steel
- Hardened
- Hand-lapped
- Gauge blocks are marked with an identification number
- **No. 32122:** For vernier callipers up to 150 mm

- **No. 32123:** For vernier callipers up to 250 mm
- **No. 32124:** For vernier callipers up to 300 mm
- **No. 32125:** For vernier callipers up to 500 mm
- **No. 32126:** For vernier callipers up to 800 mm

Advantage:

- Ideal for testing gauges and measuring instruments in test rooms

Delivery:

in high-quality wooden case, with factory calibration certificate (DAkkS on request)



Tolerance class	Number of pieces in assortment/set (PCS)	Nominal dimension in assortment	Material		1
32122...	3	30 mm, 41.3 mm, 131.4 mm	Gauge steel	Ident. No. Set price, €	010 ●
32123...	4	30 mm, 41.3 mm, 131.4 mm, 243.5 mm	Gauge steel	Ident. No. Set price, €	010 ○
32124...	5	30 mm, 41.3 mm, 131.4 mm, 243.5 mm, 281.2 mm	Gauge steel	Ident. No. Set price, €	010 ○
32125...	6	30 mm, 41.3 mm, 131.4 mm, 243.5 mm, 281.2 mm, 481.1 mm	Gauge steel	Ident. No. Set price, €	010 ○
32126...	8	30 mm, 41.3 mm, 131.4 mm, 243.5 mm, 281.2 mm, 481.1 mm, 550 mm, 700 mm	Gauge steel	Ident. No. Set price, €	010 ○

Prod. Gr. 321

ORION® Individual steel gauge blocks (ISO 3650)



Application:

For testing and calibrating measuring instruments and test equipment.

Execution:

- Gauge blocks are marked with an identification number



Tolerance class	0		1	
	Material	Gauge steel	Gauge steel	Gauge steel
Nominal dimension (mm)	32169...		32170...	
	Ident. No.		Ident. No.	
0.5	005	●	005	●
0.6	006	○	006	○
0.7	007	○	007	○
0.8	008	○	008	○
0.9	009	○	009	○
1	010	●	010	●
1.0005	510	○	510	○
1.001	501	○	501	●
1.002	502	○	502	○
1.003	503	○	503	●
1.004	504	○	504	○
1.005	505	○	505	●
1.006	506	○	506	○
1.007	507	○	507	○
1.008	508	○	508	○
1.009	509	○	509	○
1.01	401	○	401	●
1.02	402	○	402	●
1.03	403	○	403	●
1.04	404	○	404	●
1.05	405	○	405	●
1.06	406	○	406	●
1.07	407	○	407	●
1.08	408	○	408	●
1.09	409	○	409	●
1.1	410	○	410	●
1.11	411	○	411	●
1.12	412	○	412	●
1.13	413	○	413	●
1.14	414	○	414	○
1.15	415	○	415	●
1.16	416	○	416	○
1.17	417	○	417	○
1.18	418	○	418	○

Tolerance class	0		1	
	Material	Gauge steel	Gauge steel	Gauge steel
Nominal dimension (mm)	32169...		32170...	
	Ident. No.		Ident. No.	
1.19	419	○	419	○
1.2	420	○	420	●
1.21	421	○	421	○
1.22	422	○	422	○
1.23	423	○	423	○
1.24	424	○	424	○
1.25	425	○	425	●
1.26	426	○	426	○
1.27	427	○	427	○
1.28	428	○	428	○
1.29	429	○	429	○
1.3	430	○	430	●
1.31	431	○	431	○
1.32	432	○	432	○
1.33	433	○	433	○
1.34	434	○	434	○
1.35	435	○	435	●
1.36	436	○	436	○
1.37	437	○	437	○
1.38	438	○	438	○
1.39	439	○	439	○
1.4	440	○	440	●
1.41	441	○	441	○
1.42	442	○	442	○
1.43	443	○	443	○
1.44	444	○	444	○
1.45	445	○	445	●
1.46	446	○	446	○
1.47	447	○	447	○
1.48	448	○	448	●
1.49	449	○	449	●
1.5	450	●	450	●
1.6	016	○	016	●
1.7	017	○	017	●

Tolerance class	0		1	
	Material	Gauge steel	Gauge steel	Gauge steel
Nominal dimension (mm)	32169...		32170...	
	Ident. No.		Ident. No.	
1.8	018	○	018	●
1.9	019	○	019	●
2	020	●	020	●
2.5	025	○	025	●
3	030	●	030	●
3.5	035	○	035	●
4	040	○	040	●
4.5	045	○	045	●
5	050	●	050	●
5.5	055	○	055	●
6	060	○	060	●
6.5	065	○	065	●
7	070	○	070	●
7.5	075	○	075	●
8	080	○	080	●
8.5	085	○	085	●
9	090	○	090	●
9.5	095	○	095	○
10	100	●	100	●
10.5	105	○	105	○
11	110	○	110	●
11.5	115	○	115	○
12	120	○	120	●
12.5	125	○	125	○
13	130	○	130	○
13.5	135	○	135	○
14	140	○	140	○
14.5	145	○	145	○
15	150	○	150	●
15.5	155	○	155	○

Tolerance class	0		1	
	Material	Gauge steel	Gauge steel	Gauge steel
Nominal dimension (mm)	32169...		32170...	
	Ident. No.		Ident. No.	
16	160	○	160	●
16.5	165	○	165	○
17	170	○	170	●
17.5	175	○	175	○
18	180	○	180	●
18.5	185	○	185	○
19	190	○	190	●
19.5	195	○	195	○
20	200	●	200	●
20.5	205	○	205	○
21	210	○	210	○
21.5	215	○	215	○
22	220	○	220	○
22.5	225	○	225	○
23	230	○	230	○
23.5	235	○	235	○
24	240	○	240	○
24.5	245	○	245	○
25	250	○	250	●
30	300	○	300	●
40	400	○	400	●
50	500	●	500	●
60	600	○	600	●
70	700	○	700	●
75	750	○	750	●
80	800	○	800	●
90	900	○	900	●
100	910	●	910	●

Price/unit, €

Prod. Gr. 321

ORION® Individual ceramic gauge blocks (ISO 3650)



Application:

For testing and calibrating measuring instruments and test equipment.

Execution:

- Gauge blocks are marked with an identification number



Tolerance class Material	0		1	
	Ceramic		Ceramic	
Nominal dimension (mm)	32178... Ident. No.		32179... Ident. No.	
0.5	005	●	005	○
1	010	○	010	●
1.0005	510	○	510	○
1.001	501	○	501	○
1.002	502	○	502	○
1.003	503	○	503	○
1.004	504	○	504	○
1.005	505	○	505	○
1.006	506	○	506	○
1.007	507	○	507	○
1.008	508	○	508	○
1.009	509	○	509	○
1.01	401	○	401	○
1.02	402	○	402	○
1.03	403	○	403	○
1.04	404	○	404	○
1.05	405	○	405	○
1.06	406	○	406	○
1.07	407	○	407	○
1.08	408	○	408	○
1.09	409	○	409	○
1.1	410	○	410	○
1.11	411	○	411	○
1.12	412	○	412	○
1.13	413	○	413	○
1.14	414	○	414	○
1.15	415	○	415	○
1.16	416	○	416	○
1.17	417	○	417	○
1.18	418	○	418	○
1.19	419	○	419	○
1.2	420	○	420	○
1.21	421	○	421	○
1.22	422	○	422	○
1.23	423	○	423	○
1.24	424	○	424	○
1.25	425	○	425	○
1.26	426	○	426	○
1.27	427	○	427	○

Tolerance class Material	0		1	
	Ceramic		Ceramic	
Nominal dimension (mm)	32178... Ident. No.		32179... Ident. No.	
1.28	428	○	428	○
1.29	429	○	429	○
1.3	430	○	430	○
1.31	431	○	431	○
1.32	432	○	432	○
1.33	433	○	433	○
1.34	434	○	434	○
1.35	435	○	435	○
1.36	436	○	436	○
1.37	437	○	437	○
1.38	438	○	438	○
1.39	439	○	439	○
1.4	440	○	440	○
1.41	441	○	441	○
1.42	442	○	442	○
1.43	443	○	443	○
1.44	444	○	444	○
1.45	445	○	445	○
1.46	446	○	446	○
1.47	447	○	447	○
1.48	448	○	448	○
1.49	449	○	449	○
1.5	450	○	450	○
1.6	016	○	016	○
1.7	017	○	017	○
1.8	018	○	018	○
1.9	019	○	019	○
2	020	●	020	○
2.5	025	○	025	○
3	030	●	030	●
3.5	035	○	035	○
4	040	○	040	○
4.5	045	○	045	○
5	050	●	050	○
5.5	055	○	055	○
6	060	○	060	○
6.5	065	○	065	○
7	070	○	070	○
7.5	075	○	075	○

Tolerance class Material	0		1	
	Ceramic		Ceramic	
Nominal dimension (mm)	32178... Ident. No.		32179... Ident. No.	
8	080	○	080	○
8.5	085	○	085	○
9	090	○	090	○
9.5	095	○	095	○
10	100	●	100	○
10.5	105	○	105	○
11	110	○	110	○
11.5	115	○	115	○
12	120	○	120	○
12.5	125	○	125	○
13	130	○	130	○
13.5	135	○	135	○
14	140	○	140	○
14.5	145	○	145	○
15	150	○	150	○
15.5	155	○	155	○
16	160	○	160	○
16.5	165	○	165	○
17	170	○	170	○
17.5	175	○	175	○
18	180	○	180	○
18.5	185	○	185	○

Tolerance class Material	0		1	
	Ceramic		Ceramic	
Nominal dimension (mm)	32178... Ident. No.		32179... Ident. No.	
19	190	○	190	○
19.5	195	○	195	○
20	200	●	200	○
20.5	205	○	205	○
21	210	○	210	○
21.5	215	○	215	○
22	220	○	220	○
22.5	225	○	225	○
23	230	○	230	○
23.5	235	○	235	○
24	240	○	240	○
24.5	245	○	245	○
25	250	○	250	○
30	300	○	300	○
40	400	○	400	○
50	500	○	500	○
60	600	○	600	○
70	700	○	700	○
75	750	○	750	○
80	800	○	800	○
90	900	○	900	○
100	910	○	910	○

Price/unit, €

Prod. Gr. 322

ORION® Individual carbide gauge blocks (ISO 3650)



Application:
For testing and calibrating measuring instruments and test equipment.

Execution:
▪ Gauge blocks are marked with an identification number



Tolerance class	0		1	
	Material	Tungsten Carbide	Tungsten Carbide	Tungsten Carbide
Nominal dimension (mm)	32187... Ident. No.		32188... Ident. No.	
0.5	005	○	005	●
0.6	006	○	006	○
0.7	007	○	007	○
0.8	008	○	008	○
0.9	009	○	009	○
1	010	●	010	●
1.0005	510	○	510	○
1.001	501	○	501	○
1.002	502	○	502	○
1.003	503	○	503	○
1.004	504	○	504	○
1.005	505	○	505	○
1.006	506	○	506	○
1.007	507	○	507	○
1.008	508	○	508	○
1.009	509	○	509	○
1.01	401	○	401	○
1.02	402	○	402	○
1.03	403	○	403	○
1.04	404	○	404	○
1.05	405	○	405	○
1.06	406	○	406	○
1.07	407	○	407	○
1.08	408	○	408	○
1.09	409	○	409	○
1.1	410	○	410	○
1.11	411	○	411	○
1.12	412	○	412	○
1.13	413	○	413	○
1.14	414	○	414	○
1.15	415	○	415	○
1.16	416	○	416	○
1.17	417	○	417	○
1.18	418	○	418	○
1.19	419	○	419	○
1.2	420	○	420	○
1.21	421	○	421	○
1.22	422	○	422	○
1.23	423	○	423	○
1.24	424	○	424	○
1.25	425	○	425	○
1.26	426	○	426	○
1.27	427	○	427	○
1.28	428	○	428	○
1.29	429	○	429	○
1.3	430	○	430	○

Tolerance class	0		1	
	Material	Tungsten Carbide	Tungsten Carbide	Tungsten Carbide
Nominal dimension (mm)	32187... Ident. No.		32188... Ident. No.	
1.31	431	○	431	○
1.32	432	○	432	○
1.33	433	○	433	○
1.34	434	○	434	○
1.35	435	○	435	○
1.36	436	○	436	○
1.37	437	○	437	○
1.38	438	○	438	○
1.39	439	○	439	○
1.4	440	○	440	○
1.41	441	○	441	○
1.42	442	○	442	○
1.43	443	○	443	○
1.44	444	○	444	○
1.45	445	○	445	○
1.46	446	○	446	○
1.47	447	○	447	○
1.48	448	○	448	○
1.49	449	○	449	○
1.5	450	○	450	○
1.6	016	○	016	○
1.7	017	○	017	○
1.8	018	○	018	○
1.9	019	○	019	○
2	020	●	020	●
2.5	025	○	025	○
3	030	○	030	●
3.5	035	○	035	○
4	040	○	040	○
4.5	045	○	045	○
5	050	●	050	●
5.5	055	○	055	○
6	060	○	060	●
6.5	065	○	065	○
7	070	●	070	●
7.5	075	○	075	○
7.5	075	○	075	○
8	080	●	080	●
8.5	085	○	085	○
9	090	○	090	○
9.5	095	○	095	○
10	100	●	100	●
10.5	105	○	105	○
11	110	○	110	○
11.5	115	○	115	○
12	120	○	120	○

Tolerance class	0		1	
	Material	Tungsten Carbide	Tungsten Carbide	Tungsten Carbide
Nominal dimension (mm)	32187... Ident. No.		32188... Ident. No.	
12.5	125	○	125	○
13	130	○	130	○
13.5	135	○	135	○
14	140	○	140	○
14.5	145	○	145	○
15	150	○	150	●
15.5	155	○	155	○
16	160	○	160	○
16.5	165	○	165	○
17	170	○	170	○
17.5	175	○	175	○
18	180	○	180	○
18.5	185	○	185	○
19	190	○	190	○
19.5	195	○	195	○
20	200	●	200	●
20.5	205	○	205	○
21	210	○	210	○

Tolerance class	0		1	
	Material	Tungsten Carbide	Tungsten Carbide	Tungsten Carbide
Nominal dimension (mm)	32187... Ident. No.		32188... Ident. No.	
21.5	215	○	215	○
22	220	○	220	○
22.5	225	○	225	○
23	230	○	230	○
23.5	235	○	235	○
24	240	○	240	○
24.5	245	○	245	○
25	250	○	250	○
30	300	○	300	●
40	400	○	400	○
50	500	●	500	●
60	600	○	600	○
70	700	○	700	○
80	800	○	800	○
90	900	○	900	○
100	910	●	910	●

Price/unit, €

Prod. Gr. 322

ORION® Steel gauge blocks (ISO 3650)
Long version

Application:

For testing and calibrating measuring instruments and test equipment.

Execution:

- Gauge blocks are marked with an identification number

Delivery:

Comes in a wooden case, with a calibration certificate from an accredited laboratory



Tolerance class	1		0	
	Material	Gauge steel	Gauge steel	Gauge steel
Nominal dimension (mm)	32109... Ident. No.		32110... Ident. No.	
125	805	●	805	○
150	815	●	815	○
175	818	●	818	○
200	820	●	820	○
250	825	●	825	○
300	830	●	830	○
400	840	●	840	○

Tolerance class	1		0	
	Material	Gauge steel	Gauge steel	Gauge steel
Nominal dimension (mm)	32109... Ident. No.		32110... Ident. No.	
500	850	●	850	○
600	860	○	860	○
700	870	○	870	○
800	880	○	880	○
900	890	○	890	○
1000	895	○	895	○

Price/unit, €

Prod. Gr. 321

ORION® Gauge block accessories set
12 pieces

Application:

For the use of gauge blocks for measuring devices, marking instruments, etc.

- Blade tips for slot diameter

- Half round measuring arm with cylindrical attachment 4/10/20 mm

Execution:

- Adjustable gauge block holder for measuring range 50/100/200 mm
- Scriber point
- Centring tip
- Straight edge
- Base for gauge block holders
- plane measuring arms for outside measurements

Advantage:

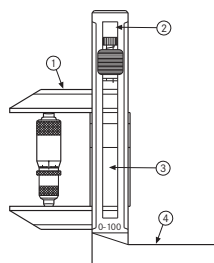
- Using this set cares for and preserves gauge blocks in

Delivery:

In a case

Technical data:

- Number of pieces in assortment/set: 17 PCS



- ① Measuring arm
- ② Gauge block holder
- ③ Gauge blocks
- ④ Base

32281...

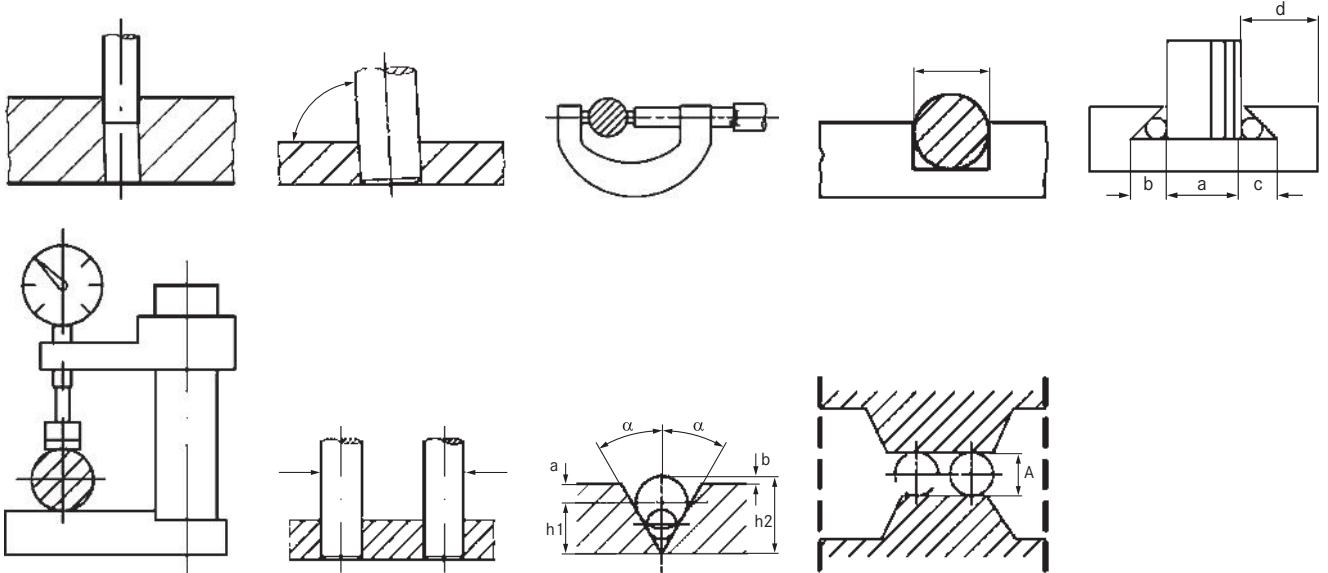
Ident. No. |
Set price, €

020

Prod. Gr. 321



Application examples for test pins



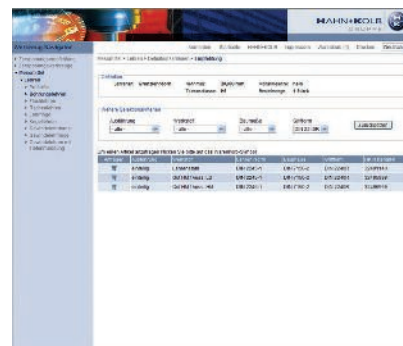
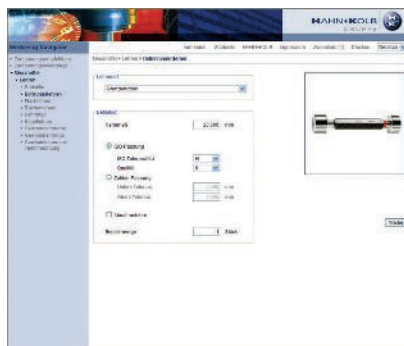
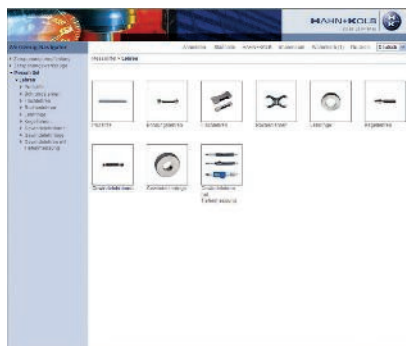


Tool navigator 'Gauges' online

The gauge navigator's simple and clear menu can be used to define your requests more easily and clearly in just four steps. Firstly, determine what type of gauge is right for the required application: The selection ranges from bore gauges, snap gauges, flat gauges and ring gauges to thread gauges. Subsequently, sizes are determined in nominal dimension specifications, ISO tolerance fields or figures and details, such as coating or material. The shopping cart will then be automatically generated and sent directly to us. This allows quotes or enquiries, particularly for special gauges, to be dealt with very quickly. We promptly check price and delivery options from different vendors and compile the best deal for you.

The gauge navigator can be found at www.werkzeug-navigator.de.
Its impressive advantages at a glance:

- Fast access and simple operation around the clock
- Automatic shopping cart generation and enquiries sent via the Internet to Hahn+Kolb
- Quick submission of quotations, even for special gauges
- Menu-guided selection for clear specification and definition of gauges
- Enquiry with clear and unambiguous definitions to avoid follow-up questions and wrong deliveries



ORION® Flat glass

flatness tolerance 0.125 µm

Application:

For testing the flatness of faces of measuring surfaces on metal and glass objects such as gauge blocks.

Execution:

- Made from special glass

41520...

Prod. Gr. 454

Delivery:

Incl. wooden case

Technical data:

- Diameter: 45 mm
- Flatness tolerance: 0.125 µm

Ident. No.	010
Price/unit, €	



ORION® Angle standards made of hardened gauge steel

Application:

For precise setting and checking of angles.

Execution:

- Smallest graduation 15' (1/4°)
- manufacturer tolerance ± 30"

32155...

Prod. Gr. 3BF

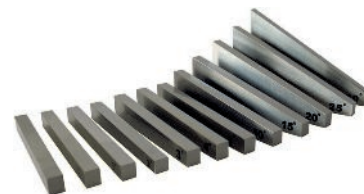
Delivery:

Set: 15°, 30°, 1°, 2°, 3°, 4°, 5°, 10°, 15°, 20°, 25°, 30°, supplied in case.

Technical data:

- Number of pieces in assortment/set: 12 PCS
- Length: 76.4 mm
- Width: 6.35 mm

Ident. No.	020
Set price, €	



ORION® Test balls made of hardened gauge steel

Application:

For testing bore holes or internal cones.

Delivery:

Each 2 x diameter 1–25 mm, in a case.

32155...

Prod. Gr. 3BD

Technical data:

- Number of pieces in assortment/set: 50 PCS
- Pitch: 1 mm

Ident. No.	030
Set price, €	



ORION® Limit plug gauges made of gauge steel (DIN 2245)
tolerance H7



Application:

For checking maximum and minimum dimensions of boreholes.

Execution:

- Go side manufactured with wear allowance in line with DIN 7164

Notes:

No. 32491: Surcharge applicable to quality class 5 and above.

Please indicate the fit for the workpiece when ordering (e.g. G9)



Illustration may be different

Nominal Ø (mm)	Tolerance class H7		A-ZC/6-13	
	Go side material	Gauge steel	Go side material	Gauge steel
	Discharge side material	Gauge steel	Discharge side material	Gauge steel
	Ident. No.	Ident. No.	Ident. No.	Ident. No.
1	005	●	005	○
1.5	015	●	015	○
2	025	●	025	○
2.5	035	●	035	○
3	045	●	045	○
3.5	050	●	050	○
4	055	●	055	○
4.5	060	●	060	○
5	065	●	065	○
6	070	●	070	○
7	075	●	075	○
8	080	●	080	○
9	085	●	085	○
10	090	●	090	○
11	095	●	095	○
12	100	●	100	○
13	105	●	105	○
14	110	●	110	○
15	115	●	115	○
16	120	●	120	○
17	125	●	125	○
18	130	●	130	○
19	135	●	135	○
20	140	●	140	○
21	145	●	145	○
22	150	●	150	○
23	155	●	155	○
24	160	●	160	○
25	165	●	165	○
26	170	●	170	○
27	175	●	175	○
28	180	●	180	○
30	185	●	185	○
32	190	●	190	○
33	195	○	195	○

Nominal Ø (mm)	Tolerance class H7		A-ZC/6-13	
	Go side material	Gauge steel	Go side material	Gauge steel
	Discharge side material	Gauge steel	Discharge side material	Gauge steel
	Ident. No.	Ident. No.	Ident. No.	Ident. No.
34	200	●	200	○
35	205	●	205	○
36	210	●	210	○
37	215	●	215	○
38	220	●	220	○
40	225	●	225	○
42	230	●	230	○
44	235	●	235	○
45	240	●	240	○
46	245	○	245	○
47	250	●	250	○
48	255	●	255	○
50	260	●	260	○
52	265	●	265	○
55	270	●	270	○
58	275	●	275	○
60	280	●	280	○
62	285	●	285	○
65	290	●	290	○
68	295	○	295	○
70	300	●	300	○
72	305	○	305	○
75	310	●	310	○
78	315	○	315	○
80	320	●	320	○
82	325	○	325	○
85	330	●	330	○
88	335	○	335	○
90	340	●	340	○
92	345	○	345	○
95	350	○	350	○
98	355	○	355	○
100	360	●	360	○

Price/unit, €

Prod. Gr. 3DB

ORION® Limit plug gauge with intermediate size and numerical tolerance (DIN 2245)



Application:

For checking maximum and minimum dimensions of boreholes.

Execution:

- Go side manufactured with wear allowance in line with DIN 7164

Notes:

Please indicate the tolerance (e.g. G9) or numerical tolerance (+/-).

Surcharge applicable to quality class 5 and above.



Illustration may be different

Min./max. nominal Ø	Go side material		Gauge steel	
	Discharge side material	Gauge steel	Discharge side material	Gauge steel
	Ident. No.	Ident. No.	Ident. No.	Ident. No.
2.001-2.999 mm		010		○
3.001-9.999 mm		020		○
10.001-13.999 mm		030		○
14.001-17.999 mm		040		○
18.001-23.999 mm		050		○
24.001-29.999 mm		060		○
30.001-39.999 mm		070		○

Min./max. nominal Ø	Go side material		Gauge steel	
	Discharge side material	Gauge steel	Discharge side material	Gauge steel
	Ident. No.	Ident. No.	Ident. No.	Ident. No.
40.001-49.999 mm		080		○
50.001-59.999 mm		090		○
60.001-69.999 mm		100		○
70.001-79.999 mm		110		○
80.001-89.999 mm		120		○
90.001-99.999 mm		130		○

Price/unit, €

Prod. Gr. 3DB

ORION® Limit plug gauge set (DIN 2245) Workpiece fit H7



Application:

For checking maximum and minimum dimensions of boreholes.

Execution:

- Go side manufactured with wear allowance in line with DIN 7164

Advantage:

- Ident. No. 020: Cemented carbide has a service life approximately 20 times longer than gauge steel

Delivery:

In a case

Technical data:

- Nominal dimension in assortment: 3 mm | 4 mm | 5 mm | 6 mm | 8 mm | 10 mm | 12 mm
- Tolerance class: H7
- Discharge side material: Gauge steel
- Design: One-piece



Go side material	Ident. No.	Gauge steel	Carbide
32493...	010	020	
	Set price, €		

Prod. Gr. 3DB

ORION® Limit plug gauges made of cemented carbide (DIN 2245)



Application:

For checking maximum and minimum dimensions of boreholes.

Execution:

- Go side manufactured with wear allowance in line with DIN 7164

Advantage:

- Cemented carbide has a service life approximately 20 times longer than gauge steel

Notes:

Surcharge applicable to quality class 5 and above.



Illustration may be different

Tolerance class	A-ZC/6-13	A-ZC/6-13	H7	H7	Tolerance class	A-ZC/6-13	A-ZC/6-13	H7	H7	
Go side material	Carbide	Carbide	Carbide	Carbide	Go side material	Carbide	Carbide	Carbide	Carbide	
Discharge side material	Carbide	Gauge steel	Gauge steel	Carbide	Discharge side material	Carbide	Gauge steel	Gauge steel	Carbide	
Nominal Ø (mm)	32496... Ident. No.	32495... Ident. No.	32495... Ident. No.	32496... Ident. No.	Nominal Ø (mm)	32496... Ident. No.	32495... Ident. No.	32495... Ident. No.	32496... Ident. No.	
1	010	○	-	-	16	160	○	160	○	
2	020	○	-	520	○	170	○	170	○	
3	030	○	-	530	○	180	○	180	○	
4	040	○	-	540	○	190	○	190	○	
5	050	○	-	550	●	200	○	200	○	
6	060	○	-	560	●	210	○	210	○	
7	070	○	070	○	-	220	○	220	○	
8	080	○	080	○	580	○	230	○	230	○
9	090	○	090	○	590	○	240	○	240	○
10	100	○	100	○	600	○	250	○	250	○
11	110	○	110	○	-	-	260	○	260	○
12	120	○	120	○	620	●	270	○	270	○
13	130	○	130	○	-	-	280	○	280	○
14	140	○	140	○	640	○	290	○	290	○
15	150	○	150	○	650	●	300	○	300	○

Prod. Gr. 3DB

ORION® Limit shaft groove gauge (DIN 7150)

Application:

For checking flat fits, e.g. of grooves.

For numerical tolerances (e.g. +/- 0.005), a surcharge is applicable.

Notes:

No. 32516: When ordering, please remember to specify the workpiece fit or tolerance.

Technical data:

- Material: Gauge steel



Tolerance class	P9	A-ZC/7-13	Tolerance class	P9	A-ZC/7-13
Nominal dimension (mm)	32515... Ident. No.	32516... Ident. No.	Nominal dimension (mm)	32515... Ident. No.	32516... Ident. No.
3	003	○	003	○	
4	004	○	004	○	
5	005	○	005	○	
6	006	●	006	○	
8	008	●	008	○	
10	010	●	010	○	
12	012	○	012	○	

Prod. Gr. 3DB

ORION® Limited snap gauge, double-ended/single-ended (DIN 7150)
double-jawed



Application:

For checking the maximum and minimum dimensions of shafts.

Execution:

- Go side manufactured with wear allowance
- **No. 32545:** Double-jawed
- **No. 32546:** Single-jawed

Notes:

When ordering, please remember to specify the workpiece fit or tolerance.
For numerical tolerances (e.g. +/- 0.005), a surcharge is applicable.

Technical data:

- Material: Gauge steel



No. 32545



No. 32546

Nominal dimension (mm)	Tolerance class		a-zc / 6-13		a-zc / 6-13	
	32545... Ident. No.		32546... Ident. No.			
2	005	o	005	o		
3	020	o	020	o		
4	030	o	030	o		
5	040	o	040	o		
6	045	o	045	o		
7	050	o	050	o		
8	055	o	055	o		
9	060	o	060	o		
10	065	o	065	o		
11	070	o	070	o		
12	075	o	075	o		
13	080	o	080	o		
14	085	o	085	o		
15	090	o	090	o		
16	095	o	095	o		
17	100	o	100	o		
18	105	o	105	o		
19	110	o	110	o		
20	115	o	115	o		
22	125	o	125	o		
23	130	o	130	o		
24	135	o	135	o		
25	140	o	140	o		
26	145	o	145	o		
27	150	o	150	o		
28	155	o	155	o		
30	160	o	160	o		
32	165	o	165	o		
34	175	o	175	o		
35	180	o	180	o		
36	185	o	185	o		

Nominal dimension (mm)	Tolerance class		a-zc / 6-13		a-zc / 6-13	
	32545... Ident. No.		32546... Ident. No.			
38	195	o	195	o		
40	200	o	200	o		
42	205	o	205	o		
45	215	o	215	o		
46	220	o	220	o		
47	225	o	225	o		
48	230	o	230	o		
50	235	o	235	o		
52	240	o	240	o		
55	245	o	245	o		
58	250	o	250	o		
60	255	o	255	o		
62	260	o	260	o		
65	265	o	265	o		
68	270	o	270	o		
70	275	o	275	o		
75	285	o	285	o		
80	295	o	295	o		
85	305	o	305	o		
90	315	o	315	o		
95	325	o	325	o		
100	335	o	335	o		
110	-	-	340	o		
125	-	-	345	o		
140	-	-	350	o		
155	-	-	355	o		
170	-	-	360	o		
185	-	-	365	o		
200	-	-	370	o		

Price/unit, €

Prod. Gr. 3DB

ORION® Adjusting ring (DIN 2250)
Made of hardened gauge steel



Application:

For adjusting and testing measuring instruments.

Execution:

- Hardened

- Marked with dimensions

Technical data:

- Material: Gauge steel



Nominal Ø (mm)	32605... Ident. No.	
2	030	o
2.5	040	o
3	050	●
4	060	●
5	070	●
6	075	●
7	080	●
8	085	●
9	090	●
10	095	●
11	100	●

Nominal Ø (mm)	32605... Ident. No.	
12	105	●
13	110	●
14	115	●
15	120	●
16	125	●
17	130	●
18	135	●
19	140	●
20	145	●
21	150	●
22	155	●

Nominal Ø (mm)	32605... Ident. No.		Nominal Ø (mm)	32605... Ident. No.	
23	160	●	75	315	●
24	165	●	78	320	○
25	170	●	80	325	●
26	175	●	82	330	●
27	180	●	85	335	●
28	185	●	88	340	●
30	190	●	90	345	●
32	195	●	92	350	○
33	200	●	95	355	●
34	205	●	98	360	○
35	210	●	100	365	●
36	215	●	105	370	●
37	220	●	110	375	●
38	225	●	115	380	●
40	230	●	120	385	●
42	235	●	125	390	●
44	240	●	130	395	●
45	245	●	135	400	○
46	250	●	140	405	●
47	255	●	145	410	○
48	260	●	150	415	○
50	265	●	155	420	○
52	270	●	160	425	●
55	275	●	165	430	○
58	280	●	170	435	●
60	285	●	175	440	●
62	290	●	180	445	●
65	295	●	190	455	●
68	300	●	200	465	●
70	305	●			
72	310	●			

Price/unit, €

Prod. Gr. 3DB

ORION® Setting rings with intermediate size (DIN 2250)



Application:
For adjusting and testing measuring instruments.

Execution:
▪ Hardened

▪ Marked with dimensions

Notes:
When ordering, please specify the required diameter.



Min./max. nominal Ø	32606... Ident. No.		Min./max. nominal Ø	32606... Ident. No.	
3.001-14.999 mm	010	○	50.001-59.999 mm	070	○
15.001-19.999 mm	020	○	60.001-69.999 mm	080	○
20.001-24.999 mm	030	○	70.001-79.999 mm	090	○
25.001-31.999 mm	040	○	80.001-89.999 mm	100	○
32.001-39.999 mm	050	○	90.001-99.999 mm	110	○
40.001-49.999 mm	060	○			

Price/unit, €

Prod. Gr. 3DB

ORION® Morse taper gauges

Application:
No. 32635: For checking internal cones of tools and workpieces.
No. 32636: For testing external tapers on tools and workpieces.

Execution:
▪ Measuring surfaces are ground and finely lapped

Technical data:
▪ Tolerance class: AT4
▪ Material: Gauge steel



No. 32635



No. 32636

Taper type	Design	Morse taper without tangs		Morse taper without tangs	
		32635... Ident. No.		32636... Ident. No.	
	MK1	010	○	010	○
	MK2	020	●	020	●
	MK3	030	●	030	●
	MK4	040	●	040	●
	MK5	050	●	050	○

Price/unit, €

Prod. Gr. 3DB

ORION® Taper gauges for steep tapers (SK)

Application:

No. 32650: For testing spindle heads in line with DIN 2079 and quick-release taper shafts in line with DIN 2080

No. 32651: For testing spindle heads in line with DIN 2079 and quick-release taper shafts in line with DIN 2081.

Execution:

- Measuring surfaces are ground and finely lapped

Technical data:

- Tolerance class: AT4
- Material: Gauge steel



No. 32650



No. 32651

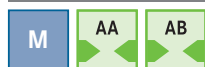
Taper type	Steep-angled taper		Steep-angled taper	
	32650... Ident. No.		32651... Ident. No.	
SK30	030	●	030	●
SK40	040	●	040	●
SK50	050	●	050	●

Price/unit, €

Prod. Gr. 3DB

ORION® Thread gauges made of gauge steel

For standard metric ISO thread



Application:

No. 32670: For testing the flank diameter of female threads and compliance with minimum dimensions of the external diameter.

No. 32675–32676: For testing the flank and core diameter of male threads.

Notes:

No. 32670: Up to M 1.4 = tolerance class 5H

No. 32675–32676: Up to M 1.4 = tolerance class 6h

Technical data:

- Material: Gauge steel



No. 32670
Illustration may be different!



No. 32675



No. 32676

Thread type x nominal Ø x pitch	Thread limit plug gauge, 6H		Go ring gauge, 6g		No-go ring gauge, 6g	
	32670... Ident. No.		32675... Ident. No.		32676... Ident. No.	
M1 x 0.25	010	○	010	○	010	○
M1.2 x 0.25	012	●	012	○	012	○
M1.4 x 0.3	014	●	014	○	014	○
M1.6 x 0.35	016	●	016	○	016	○
M1.7 x 0.35	017	●	017	○	017	○
M1.8 x 0.35	018	○	018	○	018	○
M2 x 0.4	020	●	020	●	020	●
M2.3 x 0.4	023	○	023	○	023	○
M2.5 x 0.45	025	●	025	●	025	○
M2.6 x 0.45	026	●	026	○	026	○
M3 x 0.5	030	●	030	●	030	●
M3.5 x 0.6	035	●	035	●	035	○
M4 x 0.7	040	●	040	●	040	●
M5 x 0.8	050	●	050	●	050	●
M6 x 1	060	●	060	●	060	●
M7 x 1	070	●	070	●	070	●

Thread type x nominal Ø x pitch	Thread limit plug gauge, 6H		Go ring gauge, 6g		No-go ring gauge, 6g	
	32670... Ident. No.		32675... Ident. No.		32676... Ident. No.	
M8 x 1.25	080	●	080	●	080	●
M9 x 1.25	090	●	090	○	090	○
M10 x 1.5	100	●	100	●	100	●
M11 x 1.5	110	○	110	○	110	○
M12 x 1.75	120	●	120	●	120	●
M14 x 2	140	●	140	●	140	●
M16 x 2	160	●	160	●	160	●
M18 x 2.5	180	●	180	●	180	○
M20 x 2.5	200	●	200	●	200	●
M22 x 2.5	220	●	220	○	220	○
M24 x 3	240	●	240	●	240	●
M27 x 3	270	●	270	○	270	○
M30 x 3.5	300	○	300	●	300	○
M33 x 3.5	330	○	330	○	330	○
M36 x 4	360	●	360	●	360	○

Price/unit, €

Prod. Gr. 3DB

ATORN® ORION® Thread gauge sets M3–M12 for standard metric ISO thread in line with DIN 13



Execution:

- No. 32696: Go side with TiN coating
- No. 32696–32697: Surface hardness approx. 2500 Vickers

Advantage:

- No. 32696–32697:

- Improved corrosion resistance
- Wear resistance approx. 10 times greater than conventional gauge steel
- Extended calibration intervals
- Cost reduction

Delivery:

In wooden case



No. 32690



No. 32691–32692



No. 32696



No. 32697

	ATORN®	ATORN®	ORION®	ORION®	ORION®
	Thread limit plug gauges	Go ring gauge	Thread limit plug gauges	Go ring gauge	No-go ring gauges
Nominal dimension in assortment	3 mm, 4 mm, 5 mm, 6 mm, 8 mm, 10 mm, 12 mm	3 mm, 4 mm, 5 mm, 6 mm, 8 mm, 10 mm, 12 mm	3 mm, 4 mm, 5 mm, 6 mm, 8 mm, 10 mm, 12 mm	3 mm, 4 mm, 5 mm, 6 mm, 8 mm, 10 mm, 12 mm	3 mm, 4 mm, 5 mm, 6 mm, 8 mm, 10 mm, 12 mm
Tolerance class	6H	6g	6H	6g	6g
Material	TiN	TiN	Gauge steel	Gauge steel	Gauge steel
	32696... Ident. No.	32697... Ident. No.	32690... Ident. No.	32691... Ident. No.	32692... Ident. No.
	400	400	010	010	010
			Set price, €		

ORION = Prod. Gr. 3DB
ATORN® = Prod. Gr. 325

ORION Thread gauges made of gauge steel
for metric ISO fine threads



Application:

No. 32700: For testing the flank diameter of female threads and compliance with minimum dimensions

of the external diameter.

No. 32705–32706: For testing the flank and core diameter of male threads.

Technical data:

- Material: Gauge steel



No. 32700
Illustration may be different!



No. 32705



No. 32706

Thread type x nominal Ø x pitch	Thread limit plug gauge, 6H		Go ring gauge, 6g		No-go ring gauge, 6g	
	32700... Ident. No.		32705... Ident. No.		32706... Ident. No.	
MF4 x 0.5	002	●	002	●	002	○
MF5 x 0.5	004	●	004	●	004	●
MF5 x 0.75	005	○	005	○	005	○
MF6 x 0.5	006	●	006	●	006	○
MF6 x 0.75	007	●	007	●	007	○
MF7 x 0.75	009	●	009	○	009	○
MF8 x 0.5	010	●	010	●	010	●
MF8 x 0.75	011	●	011	●	011	●
MF8 x 1	012	●	012	●	012	●
MF9 x 0.5	013	○	013	○	013	○
MF9 x 0.75	014	○	014	○	014	○
MF9 x 1	015	○	015	○	015	○
MF10 x 0.5	016	●	016	●	016	○
MF10 x 0.75	017	●	017	●	017	○
MF10 x 1	018	●	018	●	018	●
MF10 x 1.25	019	●	019	●	019	●
MF11 x 0.75	020	○	020	○	020	○
MF11 x 1	021	○	021	○	021	○
MF12 x 0.5	022	●	022	●	022	○
MF12 x 0.75	023	○	023	●	023	○
MF12 x 1	024	●	024	●	024	●
MF12 x 1.5	025	●	025	●	025	●
MF12 x 1.25	026	●	026	●	026	●
MF13 x 0.75	027	○	027	○	027	○
MF13 x 1	028	○	028	○	028	○
MF14 x 0.75	031	○	031	○	031	○
MF14 x 1	032	●	032	●	032	●
MF14 x 1.5	033	●	033	●	033	●
MF14 x 1.25	034	○	034	○	034	○
MF15 x 0.75	035	○	035	○	035	○
MF15 x 1	036	●	036	●	036	○
MF15 x 1.5	037	○	037	○	037	○
MF16 x 0.75	039	○	039	○	039	○
MF16 x 1	040	●	040	●	040	●
MF16 x 1.5	041	●	041	●	041	●
MF18 x 0.75	048	○	048	○	048	○
MF18 x 1	049	●	049	●	049	●
MF18 x 1.5	050	●	050	●	050	●
MF18 x 2	051	○	051	○	051	○
MF20 x 0.75	058	○	058	○	058	○
MF20 x 1	059	●	059	●	059	○
MF20 x 1.5	060	●	060	●	060	●
MF20 x 2	061	○	061	○	061	○
MF22 x 1	069	●	069	●	069	●
MF22 x 1.5	070	●	070	●	070	●
MF22 x 2	071	○	071	○	071	○
MF24 x 1	079	●	079	●	079	○
MF24 x 1.5	080	●	080	●	080	●
MF24 x 2	081	●	081	●	081	○
MF25 x 1	084	○	084	●	084	○
MF25 x 1.5	085	●	085	●	085	○

Prod. Gr. 3DB

Thread type x nominal Ø x pitch	Thread limit plug gauge, 6H		Go ring gauge, 6g		No-go ring gauge, 6g	
	32700... Ident. No.		32705... Ident. No.		32706... Ident. No.	
MF26 x 1	089	○	089	○	089	○
MF26 x 1.5	090	●	090	●	090	●
MF27 x 1	094	○	094	○	094	○
MF27 x 1.5	095	●	095	●	095	○
MF27 x 2	096	●	096	○	096	○
MF28 x 1	099	○	099	●	099	○
MF28 x 1.5	100	●	100	●	100	○
MF28 x 2	101	○	101	○	101	○
MF30 x 1	109	●	109	●	109	○
MF30 x 1.5	110	●	110	●	110	●
MF30 x 2	111	●	111	●	111	○
MF30 x 3	112	○	112	○	112	○
MF32 x 1.5	120	●	120	●	120	○
MF33 x 1.5	126	○	126	○	126	○
MF33 x 2	127	●	127	○	127	○
MF35 x 1.5	138	●	138	●	138	○
MF36 x 1.5	144	●	144	●	144	●
MF36 x 2	145	●	145	●	145	○
MF36 x 3	146	○	146	○	146	○
MF38 x 1.5	154	●	154	●	154	○
MF39 x 1.5	160	○	160	○	160	○
MF39 x 2	161	○	161	○	161	○
MF40 x 1.5	166	●	166	●	166	○
MF40 x 2	167	○	167	○	167	○
MF42 x 1.5	178	●	178	●	178	○
MF42 x 2	179	○	179	●	179	○
MF42 x 3	180	○	180	○	180	○
MF45 x 1.5	197	●	197	●	197	●
MF45 x 2	198	○	198	○	198	○
MF45 x 3	199	○	199	○	199	○
MF48 x 1.5	217	○	217	●	217	○
MF48 x 2	218	○	218	●	218	○
MF48 x 3	219	○	219	○	219	○
MF50 x 1.5	230	○	230	●	230	○
MF50 x 2	231	○	231	○	231	○
MF52 x 1.5	242	○	242	○	242	○
MF52 x 2	243	○	243	○	243	○
MF56 x 1.5	269	○	269	○	269	○
MF56 x 2	270	○	270	○	270	○
MF60 x 1.5	294	○	294	●	294	○
MF60 x 2	295	○	295	●	295	○
MF62 x 1.5	307	○	307	○	307	○
MF62 x 2	308	○	308	○	308	○
MF64 x 1.5	320	○	320	○	320	○
MF64 x 2	321	○	321	○	321	○
MF68 x 1.5	347	○	347	○	347	○
MF68 x 2	348	○	348	○	348	○
MF70 x 1.5	360	○	360	○	360	○
MF70 x 2	361	○	361	●	361	○

Price/unit, €

ORION® Thread gauges made of gauge steel
for UNC American standard threads



Application:
For testing the flank diameter of female threads

and compliance with minimum dimensions of the external diameter.



Illustration may be different!

UNC/UNF code	Thread type Tolerance class	UNC 2B	32730... Ident. No.
No. 4-40 UNC		●	020
No. 5-40 UNC		○	025
No. 6-32 UNC		○	030
No. 8-32 UNC		●	035
No. 10-24 UNC		○	040
No. 12-24 UNC		○	045
1/4"-20		●	080
5/16"-18		●	085
3/8"-16		●	090

UNC/UNF code	Thread type Tolerance class	UNC 2B	32730... Ident. No.
7/16"-14		○	095
1/2"-13		●	100
9/16"-12		○	105
5/8"-11		●	110
3/4"-10		●	115
7/8"-9		●	120
1"-8		○	125
			Price/unit, €

Prod. Gr. 3DB

ORION® Thread gauges made of gauge steel
for American UNF standard threads



Application:
For testing the flank diameter of female threads

and compliance with minimum dimensions of the external diameter.



Illustration may be different!

UNC/UNF code	Thread type Tolerance class	UNF 2B	32730... Ident. No.
No. 4-48 UNF		○	240
No. 5-44 UNF		○	245
No. 6-40 UNF		○	250
No. 8-36 UNF		○	255
No. 10-32 UNF		●	260
No. 12-28 UNF		○	265
1/4"-28		●	300
5/16"-24		●	305
3/8"-24		●	310

UNC/UNF code	Thread type Tolerance class	UNF 2B	32730... Ident. No.
7/16"-20		●	315
1/2"-20		●	320
9/16"-18		●	325
5/8"-18		●	330
3/4"-16		●	335
7/8"-14		●	340
1"-12		○	345
			Price/unit, €

Prod. Gr. 3DB

ORION® Thread gauges made of gauge steel
for tapered NPT American pipe thread



Application:
No. 32740: For testing the flank diameter of female threads and compliance with minimum dimensions of the external diameter.
No. 32741: For testing the flank and core diameter of male threads.

Technical data:
 ■ Material: Gauge steel
 ■ ANSI: ANSI B 1.20.1
 ■ Thread type: National pipe tapered thread



No. 32740



No. 32741

Gauges and dimensional standards \ Thread gauges

Pipe thread code	thread limit plug gauge		thread limit ring gauge	
	32740... Ident. No.		32741... Ident. No.	
1/16"-27	005	○	005	○
1/8"-27	010	●	010	●
1/4"-18	020	●	020	●
3/8"-18	030	●	030	○
1/2"-14	040	●	040	●
3/4"-14	050	●	050	●
1"-11.5	060	○	060	○
1 1/4"-11.5	070	○	070	○

Prod. Gr. 3DB

ORION® Thread gauges made of gauge steel (DIN 2999) for DIN 2999 R/Rp Whitworth pipe threads



Application:

No. 32745: For testing the flank diameter of female threads and compliance with minimum dimensions of the external diameter.

No. 32746: For testing the flank and core diameter

of male threads.

Technical data:

- Material: Gauge steel



No. 32745
Illustration may be different!

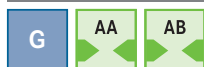


No. 32746

Pipe thread code	Thread limit plug gauge, Rp		Thread limit ring gauge R	
	32745... Ident. No.		32746... Ident. No.	
1/16"-28	005	○	005	○
1/8"-28	010	●	010	●
1/4"-19	020	●	020	○
3/8"-19	030	●	030	○
1/2"-14	040	●	040	○
3/4"-14	050	●	050	○
1"-11	060	●	060	●

Prod. Gr. 3DB

ORION® Thread gauges made of gauge steel (ISO 228) for cylindrical pipe threads G



Application:

No. 32750: For testing the flank diameter of female threads and compliance with minimum dimensions of the external diameter.

No. 32754-32755: For testing the flank and core diameter of male threads.

Technical data:

- Material: Gauge steel



No. 32750
Illustration may be different!



No. 32754



No. 32755

Pipe thread code	Tolerance class	Thread limit plug gauge		Thread go ring gauge		Thread no-go ring gauge	
		Medium		A		A	
		32750... Ident. No.		32754... Ident. No.		32755... Ident. No.	
1/8"-28		010	●	010	●	010	○
1/4"-19		015	●	015	●	015	●
3/8"-19		020	●	020	●	020	●
1/2"-14		025	●	025	●	025	●
5/8"-14		030	●	030	○	030	○
3/4"-14		035	●	035	●	035	●
7/8"-14		040	○	040	○	040	○
1"-11		045	●	045	●	045	●
1 1/8"-11		050	○	050	○	050	○
1 1/4"-11		-	-	055	●	055	○
1 1/2"-11		-	-	065	●	065	○
1 3/4"-11		-	-	075	○	075	○
2"-11		-	-	080	○	080	○

Price/unit, €

Prod. Gr. 3DB

ORION® Lightweight dial gauges with plastic housing (DIN 878)



Application:

For measuring lengths and length differences, e.g. concentricity, flatness, positional measurements.

- Extra light so easy to handle
- The plastic housing is highly resistant to chemical influences

Execution:

- Measuring pin and clamping shaft made from durable stainless steel

Delivery:

In a case



No. 33011



No. 33037

	Length measuring range (mm)	Outer Ø (mm)	Scale value (mm)	Measurement travel of one pointer revolution (mm)	Outer ring material	Ident. No.	Price/unit, €
33011...	3	40	0.01	0.5	Plastic	010	●
33037...	10	58	0.01	1.0	Plastic	010	●

Prod. Gr. 3BD

ORION® Dial gauges (DIN 878)



Application:

Ident. No. 010-020: For measuring lengths and length differences, e.g. concentricity, flatness, positional measurements.

Ident. No. 100: For measuring lengths and differences in length, e.g. concentricity, flatness, position measurements.

- Housing made of zinc
- **Ident. No. 010-020:** Measuring pin and clamping shaft made from durable stainless steel
- **Ident. No. 100:**
 - Measuring pin and clamping shank are made from durable stainless steel
 - Safety dial gauge with 7 mm free stroke

Execution:

- Particularly robust thanks to 5 mm reinforced measuring pins

Delivery:

Ident. No. 010-020: In a case

Ident. No. 100: in case



Ident. No. 010-020

	Length measuring range (mm)	Outer Ø (mm)	Scale value (mm)	Measurement travel of one pointer revolution (mm)	Shock protection	Ident. No.	Price/unit, €
33020...	0.8	58	0.01		No	100	●
33020...	10	58	0.01	1.0	No	010	●
33020...	10	58	0.01	1.0	Yes	020	●

Prod. Gr. 3BD

ORION® Electronic dial gauge



Application:
For measuring lengths and length differences, e.g. concentricity, flatness, positional measurements.

Execution:

- Aluminium housing with sturdy plastic cover
- Large LCD display (12 mm)
- mm/inch switch-over

Delivery:

Calibration certificate, additional back of dial with clamping lug, battery type SR44, in case

- Digit increment: 0.01 mm
- Data transmission type: No
- Error limit: 30 µm
- Repeat accuracy: 10 µm
- Absolute function: Yes
- Dynamic measurement: No
- Colour reading classification: No
- Rotating housing: No
- Combined indicator for figure/scale reading: No
- Manual tolerance markers: No
- Preset function: No
- IP protection class: IP 40
- Tolerance value entry: Yes
- Reversible counting direction: No



Technical data:

Length measuring range (mm)		12.5
33168...	Ident. No.	010
	Price/unit, €	●

Prod. Gr. 3BK

ORION® Electronic dial gauge with combined scale and digital display



Application:
For measuring lengths and length differences, e.g. concentricity, flatness, positional measurements.

Execution:

- mm/inch switch-over

Delivery:

In a case

Technical data:

- Data transmission type: No
- Absolute function: Yes
- Automatic switch-off: Yes
- Dynamic measurement: Yes
- Combined indicator for figure/scale reading: Yes
- Preset function: Yes
- IP protection class: IP 52
- Tolerance value entry: Yes



Ident. No. 013



Ident. No. 023

Length measuring range (mm)		12.5	12.5
Digit increment (mm)		0.01	0.001
Error limit (µm)		30	10
Repeat accuracy (µm)		10	4
33168...	Ident. No.	013	023
	Price/unit, €	●	●

Prod. Gr. 3BK

ORION® Small measuring stand

Application:

Ideal for use with lever gauge probes and small dial gauges.

Execution:

- Round permanent magnetic base
- Chrome-plated joint system
- Holder for 8 mm shaft diameters and dovetail mount

Delivery:

Without dial gauge

Technical data:

- Height: 155 mm
- Measuring arm diameter: 8 mm
- Measuring arm length: 60 mm
- Diameter of contact surface: 35 mm
- Adherence strength: 220 N



34130...

Ident. No.	021
Price/unit, €	

Prod. Gr. 3BE

ORION® Measuring stand With magnet

Application:

Ideal for use with lever gauge probes and small dial gauges.

Execution:

- Switching magnet with prismatic base
- Holder for 8 mm shaft diameters and dovetail mount

Delivery:

Without dial gauge

Technical data:

- Height: 240 mm
- Measuring arm diameter: 12 mm
- Measuring arm length: 180 mm
- Base size: 58 x 50 x 65 mm
- Adherence strength: 650 N



34160...

Ident. No.	011
Price/unit, €	

Prod. Gr. 3BE

ORION® Small measuring tables

Execution:

- Hardened, ground and lapped table
- Hardened and ground column
- Mount for dial gauges and precision pointers diameter 8 mm
- No. 34250: Round table permanently mounted on cast iron base, with rigid arm, without fine adjustment

- No. 34270: Table surface with dust grooves, cross arm horizontally adjustable, without fine adjustment

Technical data:

- Suitable for shaft diameter: 8 mm



No. 34250



No. 34270

Measuring table size	-	68 x 60 x 150	115 x 98 x 150
Measuring table Ø (mm)	50	-	-
Max. measurement height (mm)	100	150	150
Height (mm)	210	260	290
Pillar Ø (mm)	22	22	28
Overhang (mm)	49	90	130
Flatness tolerance (µm)	2	2	4
34250...	Ident. No. 100 Price/unit, €	-	-
34270...	Ident. No. Price/unit, €	100	200

Prod. Gr. 3BE

ORION® Small measuring table with threaded spindle

Execution:

- Table adjustably mounted on 3 points, flatness tolerance of table surface 3 µm
- Hardened and ground column with thread and setting ring for exact height positioning of measuring arm
- Mount for dial gauges and precision pointers diameter 8 mm

Technical data:

- Height: 300 mm
- Pillar diameter: 35 mm
- Suitable for shaft diameter: 8 mm
- Overhang: 85 mm
- Flatness tolerance: 3 µm



Ident. No. 011

Measuring table size	100 x 100 x 140	95 x 95 x 150
Max. measurement height (mm)	140	150
34272...	Ident. No. 011 Price/unit, €	021

Prod. Gr. 3BE

ORION® Measuring tables
made of hard stone

Application:

For positioning components requiring a high-precision base.

Execution:

- Hard chrome-plated column with adjusting thread and adjusting ring for precise height setting

- Holder for 8 mm shaft diameters and dovetail mount

- **No. 34310:** Rigid arm
- **No. 34312:** Parallel fine adjustment
- **No. 34314:** Movable transverse arm



No. 34310



No. 34312



No. 34314

	Measuring table size	Flatness tolerance (µm)	Max. measurement height (mm)	Height (mm)	Adapter Ø (mm)	Ident. No.	
34310...	240 x 140 x 50	3	130	280	8	Ident. No.	010
						Price/unit, €	●
34310...	300 x 210 x 60	3	200	360	8	Ident. No.	020
						Price/unit, €	○
34310...	400 x 300 x 70	3	260	450	8	Ident. No.	030
						Price/unit, €	(○)
34312...	240 x 140 x 50	3	135	280	8	Ident. No.	010
						Price/unit, €	●
34312...	300 x 210 x 60	3	235	360	8	Ident. No.	020
						Price/unit, €	●
34312...	400 x 300 x 70	3	265	450	8	Ident. No.	030
						Price/unit, €	(○)
34314...	240 x 140 x 50	3	165	280	8	Ident. No.	010
						Price/unit, €	●
34314...	300 x 210 x 60	3	260	360	8	Ident. No.	020
						Price/unit, €	●
34314...	400 x 300 x 70	3	300	450	8	Ident. No.	030
						Price/unit, €	●

Prod. Gr. 3BE

ORION® Spring dividers

Application:
For marking dimension lines, e.g. for hole circles.

Execution:

- Quick-action clamping nut and particularly strong legs

- Strong annular spring and hardened pivot pins for firm control of legs
- **No. 35015:** Replaceable tips



No. 35010



No. 35015

Length (mm)		125	150	200	250	300
35010...	Ident. No.	127	150	200	250	301
	Price/unit, €	●	●	●	●	●
35015...	Ident. No.	126	150	200	250	301
	Price/unit, €	●	●	●	●	●

Prod. Gr. 3BG

ORION® Compass vernier callipers

For marking off



Application:
For marking off on workpieces by directly setting the required dimensions.

Execution:

- **No. 35025:** Hardened steel marking-off arms

- **No. 35026:** Carbide-tipped marking-off arms

Technical data:

- Vernier scale: 0.1 mm
- Limb length: 40 mm



Max. length of application area (mm)		150	200	300
Max. Ø (mm)		300	400	600
35025...	Ident. No.	150	200	300
	Price/unit, €	●	●	●
35026...	Ident. No.	150	200	300
	Price/unit, €	○	●	●

Prod. Gr. 3BG

ORION® Dividers

Application:
For marking dimension lines, e.g. for hole circles.

Execution:

- Rivet hinge, forged

- Three-part milled joint
- Finely ground, hardened tips
- With wing



Length (mm)		150	200	250	300	500
35003...	Ident. No.	015	020	025	030	050
	Price/unit, €	●	●	●	●	●

Prod. Gr. 3BG

ORION® Marking gauge
With fine adjustment

Application:

For precise marking off parallel to the workpiece edge.

- Exchangeable, hardened scribing tip
- Steel slide with rectangular stop plate
- With fine adjustment

Execution:

- Round rod made of INOX steel, with guide groove
- Graduation with 1 mm scale interval

Technical data:

- Scale value: 0.1 mm



Max. working length (mm)		200	300
35051...	Ident. No.	020	030
	Price/unit, €	●	●

Prod. Gr. 3BG

ORION® Marking gauge
With runner

Application:

For precise marking off parallel to the workpiece edge.

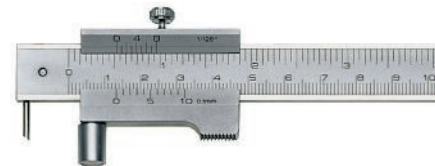
- Exchangeable cemented carbide marking-off needle
- Locking screw

Execution:

- INOX steel beam

Technical data:

- Max. working length: 200 mm
- Scale value: 0.1 mm



35052...	Ident. No.	011
	Price/unit, €	●

Prod. Gr. 3BG

ORION® Marking gauge
With flat slide

Application:

For precise marking off parallel to the workpiece edge

- Anti-glare, brushed chromium-plated
- Hardened, wide marking-off edge

Execution:

- Flat, with millimetre pitch

Technical data:

- Scale value: 1 mm



Max. working length (mm)		200	250	300
35053...	Ident. No.	020	025	030
	Price/unit, €	●	●	●

Prod. Gr. 3BG

ORION® Scriber
Sturdy cast iron base



Application:

For marking scale lines on workpiece surfaces.

Execution:

- Fine adjustment
- Carbide-tipped marking-off needle
- Ergonomically designed cast iron base

Max. length measuring range (mm)		300	600
Vernier scale		0.05 mm	0.05 mm
Base length x base width		136 x 91 mm	180 x 120 mm
35060...	Ident. No.	031	061
	Price/unit, €	●	●

Prod. Gr. 3BE



ORION® Height measuring and marking-off device

Round scale and double guide


Application:

For marking scale lines on workpiece surfaces and for measuring heights and clearances.

- Rotating scale dial
- Double counter, one positive counter, one negative counter

Execution:

- Adjusted using hand wheel
- Carbide-tipped marking-off needle
- Ergonomically designed cast iron base

Delivery:

Basic device, 1 carbide-tipped measuring and marking-off blade, 1 clamping element for marking-off blade and gauge slides

Max. length measuring range (mm)		300	600
Scale value (mm)		0.01	0.01
Base length x base width		125 x 85 mm	180 x 120 mm
35140...	Ident. No.	030	060
	Price/unit, €	●	●

Prod. Gr. 3BE



ORION® Electronic scribers


Application:

For marking scale lines on workpiece surfaces.

- ON/OFF
- Zero setting at any position
- mm/inch switch-over
- HOLD function
- ABS/TOL/SET

Execution:

- Guide column made from INOX steel
- Fine adjustment
- Carbide-tipped marking-off needle
- Ergonomically designed cast iron base

Delivery:

Battery included (type SR44)

Max. length measuring range (mm)		300	600
Digit increment (mm)		0.01	0.01
Base length x base width		136 x 91 mm	136 x 91 mm
35125...	Ident. No.	031	061
	Price/unit, €	●	●

Prod. Gr. 3BE



ORION® 3-piece measuring probe set with ruby balls For height measuring devices

Application:

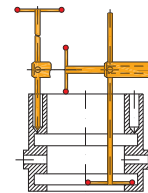
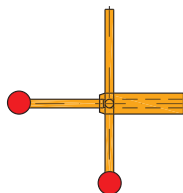
For measuring grooves, recesses, offsets, cross holes etc.

Execution:

- Probes can be clamped axially and radially

Delivery:

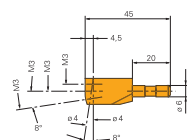
With hexagonal screwdriver in a case



Number of pieces in assortment/set (PCS)	Composition of set	35172... Ident. No.
3	T-probe: Length 100 mm 2 ruby balls diameter 2 mm ball distance 18 mm straight gauge slide: Length 100 mm ruby ball diameter 6 mm measuring probe holder: Overall length 63 mm	080 ●
		Set price, €

Prod. Gr. 3BE

ORION® Universal measuring probe assortment for MICRO-HITE/TESA-HITE height measuring devices, hardened steel



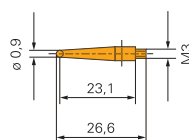
Ident. No. 300



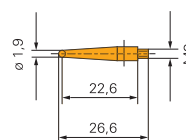
Ident. No. 310



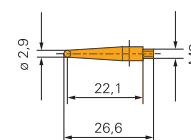
Ident. No. 320



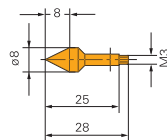
Ident. No. 330



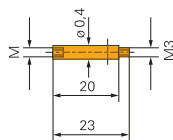
Ident. No. 340



Ident. No. 350



Ident. No. 360



Ident. No. 370-380

35172...	Gauge slide holder M3	Ident. No.	300
35172...	Probe rod angled 8°	Price/unit, €	●
35172...	Probe rod, cylindrical, offset	Ident. No.	310
35172...	Spherical measuring probe, diameter 0.9 mm	Price/unit, €	●
35172...	Spherical measuring probe, diameter 1.9 mm	Ident. No.	320
35172...	Spherical measuring probe, diameter 1.9 mm	Price/unit, €	●
35172...	Spherical measuring probe, diameter 2.9 mm	Ident. No.	330
35172...	Spherical measuring probe, diameter 2.9 mm	Price/unit, €	●
35172...	Conical measuring probe, diameter 8 mm	Ident. No.	340
35172...	Conical measuring probe, diameter 8 mm	Price/unit, €	●
35172...	Measuring probe extension M3 to M3	Ident. No.	350
35172...	Measuring probe extension M3 to M3	Price/unit, €	●
35172...	Measuring probe adapter M3 to M2.5	Ident. No.	360
35172...	Measuring probe adapter M3 to M2.5	Price/unit, €	○
35172...		Ident. No.	370
35172...		Price/unit, €	●
35172...		Ident. No.	380
35172...		Price/unit, €	○

Prod. Gr. 3BE

ORION® Vee blocks made of special cast iron

Application:

For checking, marking off and aligning cylindrical parts.

- No. 35180: Finely milled
- No. 35181: Finely ground

Execution:

- Machined in pairs
- Vee block faces and base machined level and parallel

Delivery:
In pairs

Technical data:

- Angle: 90 Degree



Length x width x height	Flatness tolerance (mm)	Min./max. workpiece Ø	35180... Ident. No.	35181... Ident. No.
50 x 40 x 30 mm	0.04	4-30 mm	005	-
75 x 40 x 30 mm	0.04	6-40 mm	007	-
100 x 40 x 30 mm	0.04	6-50 mm	010	-
150 x 50 x 40 mm	0.05	8-60 mm	015	-
200 x 70 x 50 mm	0.05	8-70 mm	020	-
50 x 40 x 30 mm	0.016	4-30 mm	-	005
100 x 40 x 30 mm	0.016	6-50 mm	-	010
150 x 50 x 40 mm	0.016	8-60 mm	-	015
200 x 70 x 50 mm	0.016	8-70 mm	-	020

Price/pair, €

Prod. Gr. 3BE

ORION® Pair of vee blocks Made of hardened steel

Application:

For checking, marking off and aligning cylindrical parts.

- Finely ground

Execution:

- Machined in pairs
- Vee block faces and base machined level and parallel

Delivery:
In pairs

Technical data:

- Flatness tolerance: 0.004 mm
- Angle: 90 Degree



Length x width x height	75 x 35 x 30 mm	100 x 47 x 40 mm	150 x 55 x 45 mm	200 x 65 x 55 mm	250 x 85 x 70 mm
Min./max. workpiece Ø	5-40 mm	5-55 mm	5-60 mm	5-75 mm	5-100 mm
Ident. No.	075	100	150	200	250
Price/pair, €	●	●	●	●	●

Prod. Gr. 3BE

ORION® Parallels with v-shaped recesses Special cast iron

Application:

For checking, marking off and aligning cylindrical parts.

- Finely ground

Execution:

- Machined in pairs

Technical data:

- Flatness tolerance: 0.016 mm
- Angle: 90 Degree



Length x width x height	75 x 150 x 130 mm	90 x 200 x 170 mm
Min./max. workpiece Ø	8-120 mm	10-180 mm
Ident. No.	011	021
Price/pair, €	●	●

Prod. Gr. 3BE

ORION® Concentricity test device in lightweight design

Application:
For measuring the axial and radial run-out precision of shafts.

▪ The measuring stand can be moved and locked on the rear slotted beam

Execution:

- Clamping table made of hard anodised aluminium profile with guide groove
- 2 movable tailstocks with hardened, ground 60° tip/diameter 16 mm, 1 tailstock with movable clamping tip (hub approx. 10 mm)

Technical data:

- Point height: 75 mm
- Max. point width: 340 mm
- Base plate length: 500 mm
- Base plate width: 60 mm
- Groove width: 10 mm
- Weight: 6.4 kg



35471...

Ident. No.	010
Price/unit, €	•

Prod. Gr. 3BE

ORION® Twist drill grinding gauges

Application:

For inspecting the tip angle (118°) of twist drills

Execution:

- Suitable for drills up to 50 mm
- Grinding gauge angle 121° (produces tip angle 118°)



36001...

Ident. No.	010
Price/unit, €	•

Prod. Gr. 3BF

ORION® Chamfer vernier callipers

Application:

For inspecting chamfer angles and dimensional accuracy

Delivery:

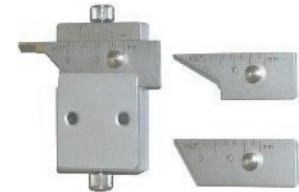
In wooden case

Execution:

- With interchangeable inspection straight edges for 30°, 45° and 60° chamfers

Technical data:

- Min./max. length measuring range: 0-10 mm
- Vernier scale: 0.1 mm



36030...

Ident. No.	010
Price/unit, €	•

Prod. Gr. 3BF

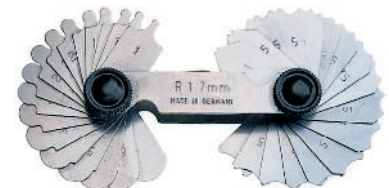
ORION® Radius gauges concave and convex

Application:

For testing inner and outer radii

Execution:

- Blades fixed with clamping screws



No. 36130

Number of sheets (PCS)	34	32	30
Radius sizes in assortment	1-3 mm, increasing by 0.25 mm, 3.5-7 mm, increasing by 0.5 mm	7.5-15 mm, increasing by 0.5 mm	15.5-20 mm, increasing by 0.5 mm, 21-25 mm, increasing by 1 mm
Cutting edge length (mm)	70	85	85
Material	36130... Ident. No.	36131... Ident. No.	36132... Ident. No.
Steel	010	010	010
Stainless steel	020	020	020
	Set price, €		

Prod. Gr. 3BF

ORION® Thread pitch gauges Milled

Application:

For testing thread pitch using the light gap method

Execution:

- No. 36053: For metric threads, Whitworth threads
- No. 36054: For metric threads, Whitworth threads and Whitworth pipe threads



Number of sheets (PCS)	36053... Ident. No.	36054... Ident. No.
52	010	-
58	-	010
	Set price, €	

Prod. Gr. 3BF

ORION® Thread cutting gauges

Application:

For testing flank angles of thread cutting tools.

Execution:

- No. 36060: For 55° Whitworth threads
- No. 36061: For 60° metric threads



No. 36060

36060...	Ident. No.	010
	Price/unit, €	●
36061...	Ident. No.	010
	Price/unit, €	●

Prod. Gr. 3BF

ORION® Thread lathe tool gauge

Application:

For inspecting thread cutting tools

- Trapezoidal thread in line with DIN 103, pitch 2-12 mm
- Flank angle 30°
- Sharp V thread 55° and 60°

Execution:

- With recesses for square threads, 2-8 starts per 1"



36075...	Ident. No.	010
	Price/unit, €	●

Prod. Gr. 3BF

ORION® Feeler gauges

Application:

Suitable for inspecting gap dimensions and setting clearances.

- Conical
- Can be fixed in sheath

Execution:

- Gauge blades made from hardened spring steel

Notes:
Cannot be calibrated



	Min./max. length of application area	Nominal dimension in assortment	Number of sheets (PCS)	Length (mm)	Width (mm)	Ident. No.	Set price, €
36180...	0.04-0.15 mm	0.04-0.10 mm, increasing by 0.01 mm, 0.15 mm	8	100	13	010	●
36181...	0.05-0.5 mm	0.05-0.3 mm, increasing by 0.05 mm, 0.4 mm, 0.5 mm	8	100	13	010	●
36182...	0.05-1 mm	0.05-0.3 mm, increasing by 0.05 mm, 0.4-1.0 mm, increasing by 0.1 mm	13	100	13	010	●
36183...	0.05-1 mm	0.05-1.0 mm, increasing by 0.05 mm	20	100	13	010	●
36184...	0.1-2 mm	0.1-2.0 mm, increasing by 0.1 mm	20	100	13	010	●

Prod. Gr. 3BF

ORION® Feeler gauges (DIN 2275)
precision design

Application:

Suitable for inspecting gap dimensions and setting clearances.

Execution:

- Gauge blades made from hardened spring steel
- Conical
- Can be fixed in nickel-plated sheath



Min./max. length of application area	0.05-0.5 mm	0.05-1 mm	0.05-1 mm
Nominal dimension in assortment	0.05-0.3 mm, increasing by 0.05 mm, 0.4 mm, 0.5 mm	0.05-0.3 mm, increasing by 0.05 mm, 0.4-1.0 mm, increasing by 0.1 mm	0.05-1.0 mm, increasing by 0.05 mm
Number of sheets (PCS)	8	13	20
Length (mm)	100	100	100
Width (mm)	13	13	13
	36189... Ident. No.	36189... Ident. No.	36189... Ident. No.
	008 ●	013 ●	020 ●
	Set price, €		

Prod. Gr. 3BF

Feeler gauges
non-magnetic

Application:

Suitable for inspecting gap dimensions and setting clearances.

Execution:

- Brass gauge blades
- Conical
- Can be fixed in nickel-plated sheath



		Min./max. length of application area	Nominal dimension in assortment	Number of sheets (PCS)	Length (mm)	Width (mm)		
ORION	36196...	0.1-0.8 mm	0.1-0.4 mm, increasing by 0.05 mm, 0.5 mm, 0.6 mm, 0.7 mm, 0.75 mm, 0.8 mm	12	100	13	Ident. No.	010 ●
							Set price, €	

Prod. Gr. 361

THE HIGHEST QUALITY PRODUCTS FOR MAXIMUM EFFICIENCY.

WE HAVE WHAT IT TAKES.

For a complete range of products that meet the toughest demands, visit www.iconridge.com

ORION® Feeler gauge strips, dimensions 13 mm x 5 m

Application:

For use in various areas of mechanical engineering, e.g. measuring dimensional tolerance between 2 components, as alignment references etc.

Execution:

- Made from high carbon steel, hardened
- Suitable for feeler gauge assortment in wall bracket

- **Ident. No. 008–100:** Gauge strip marked with dimensions

Delivery:

In can

Technical data:

- Length: 5 m
- Width: 13 mm



Nominal thickness (mm)	36225... Ident. No.	
0.01	001	●
0.02	002	●
0.03	003	●
0.04	004	●
0.05	005	●
0.06	006	●
0.07	007	●
0.08	008	●
0.09	009	●
0.1	010	●
0.12	012	●
0.15	015	●
0.18	018	●
0.2	020	●
0.25	025	●
0.3	030	●

Nominal thickness (mm)	36225... Ident. No.	
0.35	035	●
0.4	040	●
0.45	045	●
0.5	050	●
0.55	055	●
0.6	060	●
0.65	065	●
0.7	070	●
0.75	075	●
0.8	080	●
0.85	085	●
0.9	090	●
0.95	095	●
1	100	●

Price/unit, €

Prod. Gr. 3BF

ORION® Feeler gauge strip assortment in wall support

The organisation system for your workshop

Application:

For use in various areas of mechanical engineering, e.g. measuring dimensional tolerance between 2 components, as alignment references etc.

Execution:

- Practical holder for clamping sections of feeler gauge strip
- 15 feeler gauge cans 13 mm x 5 m
- Wall-mounted holder made of sheet steel, paint: RAL 7035, light grey



Min./max. length of application area	0.01-0.25 mm	0.30-1.00 mm
Nominal dimension in assortment	0.01-0.1 mm increasing by 0.01 mm 0.12 mm 0.15 mm 0.18 mm 0.2 mm 0.25 mm	0.3-1.0 mm increasing by 0.05 mm
Length x width x height	330 x 100 x 110 mm	330 x 210 x 220 mm
36225...	Ident. No. 400	Ident. No. 410
	Set price, € ●	Set price, € ●

Prod. Gr. 3BF

ORION® Tape measure



Application:

For measuring distances with mm precision

Execution:

- compact, robust plastic housing made of ABS
- automatic tape rewind

- with tape lock and additional quick stop button on underside of housing
- steel tape, painted white, with mm graduation in line with accuracy class EC II and CE marking
- Screwed-on belt clip



Length (m)	2	3	5
Width (mm)	13	13	19
	37005... Ident. No.	37005... Ident. No.	37005... Ident. No.
	025 ●	035 ●	055 ●
	Price/unit, €		

Prod. Gr. 3BL

ORION® Laser distance measuring instruments

Application:

For non-contact measurement of lengths, areas and volumes.

Advantage:

- Enormous savings of time and money

- Fast and accurate measurement thanks to the visible laser target point

Delivery:

Measuring instrument, batteries, operating instructions, protective case

Coverage distance (m)	40	100
Measuring accuracy	+/- 2 mm	+/- 2 mm
IP protection class	IP 54	IP 54
Laser category	2M	2M
Measuring functions	Continuous measurement Area measurement Volume measurement Length measurement	Continuous measurement Area measurement Volume measurement Length measurement
With addition/subtraction	Yes	Yes
Space calculation	Yes	Yes
Automatic switch-off	Yes	Yes
Indirect measurement	Yes	Yes
With tripod socket	Yes	Yes
Measured value memory	No	No
Length x width x height	121 x 56 x 28 mm	121 x 56 x 28 mm
Weight (g)	150	150
37062... Ident. No.	040	100
Price/unit, €	●	●

Prod. Gr. 371



ORION® Rulers



Execution:

- Made of INOX spring steel
- Small cross-section for flexible design
- All edges ground and burr-free
- Anti-glare, matt surface
- Graduations insensitive to many chemicals, greases and oils

- **No. 37101:** 2 scale graduations: Scale graduation 1 mm top and bottom
- **No. 37102:** 2 scale graduations: Scale graduations top 0.5 mm/bottom 1 mm

Technical data:

- Accuracy class: II

Length (mm)		150	200	300	500	1000	2000
Cross-section length x cross-section width		13 x 0.5 mm	13 x 0.5 mm	13 x 0.5 mm	18 x 0.5 mm	18 x 0.5 mm	18 x 0.5 mm
37101...	Ident. No.	015	020	030	050	100	200
	Price/unit, €	●	●	●	●	●	●
37102...	Ident. No.	015	020	030	050	100	200
	Price/unit, €	●	●	●	●	●	●

Prod. Gr. 3BG

ORION® Knife-edge square, adjustable



Application:

For testing planar surfaces using the light gap method

Execution:

- Continuously sliding straight edge
- Clamp spindle lock mechanism
- Hardened
- Lapped test surfaces on basic body and lapped straight test edge

Advantage:

- Very good accessibility in recesses etc.

Technical data:

- Length: 60 mm
- Cross-section length x cross-section width: 4 x 4 mm
- Base body dimension: 40 x 9 x 23 mm



38160...	Ident. No.	012
	Price/unit, €	●

Prod. Gr. 3BG

ORION® Universal centring square

Application:

For centring and marking off centre points of round discs and shafts.

Execution:

- Function faces finely ground
- mm graduation on rail



Limb length x limb length 2	100 x 70 mm	150 x 130 mm	200 x 150 mm	250 x 160 mm	300 x 180 mm	400 x 250 mm	500 x 330 mm
Suitable for max. Ø (mm)	90	190	220	230	280	380	530
38191...	Ident. No.	010	015	020	025	030	050
	Price/unit, €	●	●	●	●	●	○

Prod. Gr. 3BG

ORION® Adjustable square

Application:

For setting angles, e.g. using a reference part

Execution:

- Galvanised
- 3-part with locking screw
- Top edges precisely machined, flat sides smoothed



Length (mm)		150	200	300	500
Cross-section length x cross-section width		16 x 4 mm	16 x 4 mm	18 x 4 mm	25 x 5 mm
38201...	Ident. No.	015	020	030	050
	Price/unit, €	●	●	●	●

Prod. Gr. 3BG

ORION® Protractor



Application:
For measuring 0-180° angles

Execution:

- Locking screw
- Made of chromium-plated special steel
- Anti-glare, brushed chromium-plated scale



Limb length (mm)		120	150	200	300	500
Degree arc Ø (mm)		80	120	150	200	300
38217...	Ident. No.	008	012	015	020	030
	Price/unit, €	•	•	•	•	•

Prod. Gr. 3BG

ORION® Electronic protractor



Application:
For measuring 0-180° angles

Execution:

- Mobile measuring arm fixed using knurled thumb screw
- Adjust or set to zero on any flat surface
- 0.05° digit increment
- Made of stainless steel
- Error limit ±0.3°
- Overhead display



Limb length (mm)		150	200	300
Degree arc Ø (mm)		120	150	200
38235...	Ident. No.	010	015	020
	Price/unit, €	•	•	•

Prod. Gr. 3BM

ORION® Electronic inclinometer



Application:
For easy and rapid measurement of inclinations

Execution:

- Error limit 0.5°
- Large LCD display

Advantage:

- Display in degrees
- Arrow in display shows direction of inclination
- Simple adjustment in normal position (reset)
- Hold function
- 0.05° digit increment

Advantage:

- Adhesive magnets on 3 sides
- Rotating display for overhead measurements

Technical data:

- Length x width x height: 57 x 30 x 57 mm



38600...	Ident. No.	100
	Price/unit, €	•

Prod. Gr. 383

ORION® Electronic inclinometer



Application:
For easy and rapid measurement of inclinations

Execution:

- Error limit 0° and 90° = 0.1° intermediate dimensions = 0.2°

Advantage:

- Display in degrees or percentages
- Arrow in display shows direction of inclination
- Simple adjustment in normal position (reset)
- Hold function
- Made from hard-anodised light metal
- Base with narrow V-shaped recess for attachment to shafts
- 1 base with adhesive magnets
- Digit increments 0.1° or 0.1%

Advantage:

- Short and compact shape
- Rotating display for overhead measurements

Delivery:
With battery (1 x 3 V lithium type CR2032) and holster

Technical data:

- Length x width x height: 151 x 35 x 60 mm

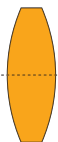


38600...	Ident. No.	010
	Price/unit, €	•

Prod. Gr. 383



Magnifiers and reading glasses
Lens systems



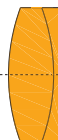
Biconvex lens system
Biconvex lens system lenses are lenses with two convex surfaces. It is the simplest and most commonly used lens shape for magnifiers. In contrast to biconvex lenses, plano-convex lenses have one convex and one flat surface. Plano-convex lenses are used in aplanatic lens systems. (See aplanatic lens system).



Aspheric lens system
The surfaces of a spherical lens correspond to a section of the surface of a sphere. In contrast, aspheric lenses deviate from this spherical shape. Comparatively higher magnifications can be achieved using aspheric lenses as the defects that inevitably occur in any image produced by lenses are minimised.



Aplanatic lens system
Aplanatic lens systems consist of 2 plano-convex lenses, where the convex sides face each other internally. This allows a larger field of vision with sharp edges at a relatively high magnification.



Achromatic lens system
Achromatic lens systems consist of at least 2 cemented lenses. The facing sides must have the identical opposite curvature. The lenses consist of crown and flint glass. Achromatic lenses deliver transparent images to the edge of the visual field, even for high-contrast objects.

Folding pocket magnifiers

Application:
For magnifying small objects

- Execution:**
- No. 41100: Glass lens in plastic frame
 - No. 41120: Glass lens in metal holder
 - Nickel-plated brass cover panels

- No. 41125: Glass lens in plastic holder
- Nickel-plated brass cover panels
- No. 41130: Dust-proof plastic housing

Advantage:

- No. 41130: Precision magnifying glass for pin-sharp images free from chromatic aberration



No. 41100



No. 41120



No. 41125



No. 41130

		Magnification	Lens Ø (mm)	Lens design	Lens material	Ident. No.	
ORION	41100...	3,5-times	55	Biconvex	Glass	Ident. No.	011
						Price/unit, €	●
ORION	41120...	6-times	23	Aplanatic	Glass	Ident. No.	011
						Price/unit, €	●
ORION	41120...	8-times	23	Aplanatic	Glass	Ident. No.	021
						Price/unit, €	●
ORION	41120...	10-times	23	Aplanatic	Glass	Ident. No.	031
						Price/unit, €	●
ORION	41120...	15-times	18	Aplanatic	Glass	Ident. No.	051
						Price/unit, €	●
ORION	41120...	20-times	18	Aplanatic	Glass	Ident. No.	061
						Price/unit, €	●
ATORN	41125...	3/6/9-times	30	Biconvex	Glass	Ident. No.	011
						Price/unit, €	●
ESCHENBACH	41130...	3/6/9-times	23	Achromatic	Glass	Ident. No.	010
						Price/unit, €	●

ESCHENBACH = Prod. Gr. 4AA
ORION = Prod. Gr. 454
ATORN = Prod. Gr. 490

ORION® LED magnifying lamp Flex arm

Application:

For magnifying small parts with additional light source.

Execution:

- Illuminated by 60 LEDs
- Mounted with table clamp
- Gooseneck stand
- Flexible arm length 50 cm

Advantage:

- Very large visual field
- Maintenance-free with long-lasting LEDs

- Ergonomic handle for easy adjustment of flexible arm

Delivery:

Lamp, including power pack and table clamp, 65 mm

Technical data:

- Magnification: 1,75-times
- Lens diameter: 170 mm
- Lens design: Biconvex
- Lens material: Glass
- Version: Swan neck with table clamp



41330...

Prod. Gr. 454

Ident. No.	020
Price/unit, €	●

ORION® Magnifierr ingl amp

Application:

For magnifying small parts with additional light source.

Execution:

- Fluorescent tube 22 W
- Reach 900 mm
- Spring balance allows it to be clamped in any position

- Mains connection 230 V, 50 Hz

Technical data:

- Magnification: 1,75-times
- Lens diameter: 120 mm
- Lens design: Biconvex
- Lens material: Glass
- Version: Articulated arm with table clamp



41330...

Prod. Gr. 454

Ident. No.	010
Price/unit, €	●

ORION® Mini stand magnifier

Application:

For visual inspection of surfaces, edge sharpness etc.

Execution:

- Biconvex silicate glass lens
- Brass housing, chrome-plated
- Folding

Advantage:

- Folded out magnifier: exact vertical distance from viewed surface
- Folded magnifier: slim and compact design
- Absolutely steady, sharp image when placed over object

Technical data:

- Lens design: Biconvex



Magnification		5-times	8-times	10-times
Lens Ø (mm)		31.5	17.5	14.5
Height (mm)		53	33	27
41528...	Ident. No.	051	081	101
	Price/unit, €	●	●	●

Prod. Gr. 454

ORION® Measuring magnifying glass Full metal design

Application:

For measuring surfaces in workshops, laboratories, quality assurance, e.g. measuring indentations during Brinell hardness test

- INOX steel scale, black engraved divisions

Technical data:

- Lens design: Aplanatic
- Lens material: Glass

Execution:

- Parallax-free, distortion-free reading

Magnification		6-times	8-times	10-times	12-times
Max. length measuring range (mm)		20	10	10	6
Scale value (mm)		0.1	0.1	0.1	0.05
41535...	Ident. No.	060	080	100	120
	Price/unit, €	●	●	●	●

Prod. Gr. 454



ORION® D200 mobile rebound hardness tester (DIN 50156)

Separate impact unit type D and wireless printer

Application:

For determining and directly displaying hardness values in line with HL (Leeb), HB, HV, HRB (Rockwell B), HRC, HS (Shore) and tensile strength in N/mm². Suitable for large components made from steel, stainless steel, cast iron, aluminium alloys, brass, bronze and copper forged alloys from a mass of approx. 5 kg upwards.

Execution:

- Separate impact unit type D, HM ball diameter 3 mm
- Backlit, 3.9", colour, LCD touch screen display (240 x 320 pixels)
- Individual value and mean value display, absolute range, no. of measurements
- Dynamic rebound method in line with ASTM A956 and DIN 50156
- Probe test direction can be selected depending on the position of the surface being measured
- internal memory for 500 measurements
- Wireless printer

- Material groups: 1.) Low-alloy/unalloyed steel, 2.) Tool steel, 3.) Corrosion-resistant steel, 4.) Grey cast iron GG, 5.) Spheroidal cast iron, 6.) Aluminium cast alloys, 7.) Brass, 8.) Bronze, 9.) Copper forged alloys, 10.) Forged steel

Advantage:

- Standard conversion tables integrated in the device are split into ten material groups
- Hardness values are immediately displayed according to a pre-defined hardness scale
- Wireless printer for documenting individual measurements or measurement series

Delivery:

Display unit, separate impact unit, hardness reference block, wireless printer, charger, cleaning brush, USB cable, stylus, software and transport case.

Notes:

Components with a reduced mass of < 5 kg must be suitably positioned vibration-free on a large metal subsurface.



Measuring range (low-alloy steel)	560-950 HL 81-955 HV 81-654 HB 32.5-97.9 HS 38.4-99.5 HRB 20-68.4 HRC 375-2639 N/mm ²
Hardness accuracy	± 6 HL
Hardness revolution	1 HL 1 HB 1 HV 1 N/mm ² 1 HS 0.1 HRC 0.1 HRB
Rechargeable battery/battery designation	1.2 V NiMH AAA
Length x width x height	130 x 87 x 28 mm
42160...	Ident. No. 095

Prod. Gr. 423

ORION® D400 mobile rebound hardness tester (DIN 50156)

Separate impact unit type D

Application:

For determining and directly displaying hardness values in line with HL (Leeb), HB, HV, HRB (Rockwell B), HRC, HS (Shore) and HRA. Suitable for large components made from steel, stainless steel, cast iron, aluminium alloys, brass, bronze and copper forged alloys from a mass of approx. 5 kg upwards.

Execution:

- Separate impact unit type D, HM ball diameter 3 mm
- Backlit LCD display (128 x 64 pixels)
- Individual value and mean value display, absolute range, no. of measurements
- Dynamic rebound method in line with ASTM A956 and DIN 50156
- Probe test direction can be selected depending on the position of the surface being measured
- internal memory for 1974 measurements

- Material groups: 1.) Low-alloy/unalloyed steel, 2.) Tool steel, 3.) Corrosion-resistant steel, 4.) Grey cast iron GG, 5.) Spheroidal cast iron, 6.) Aluminium cast alloys, 7.) Brass, 8.) Bronze, 9.) Copper forged alloys

Advantage:

- Standard conversion tables integrated in the device are split into nine material groups
- Hardness values are immediately displayed according to a pre-defined hardness scale

Delivery:

Display unit, separate impact unit D, hardness reference block (HLD value), software with connecting cable, batteries, coupling compound, cleaning brush and transport case.

Notes:

Components with a reduced mass of < 5 kg must be suitably positioned vibration-free on a large metal subsurface.



Measuring range (low-alloy steel)	200-900 HL 80-940 HV 80-650 HB 32-100 HS 60-100 HRB 20-68 HRC 59-86 HRA
Hardness accuracy	± 4 HL (0.5% at 800 HL)
Hardness revolution	1 HL 1 HB 1 HV 1 HS 0.1 HRC 0.1 HRB
Rechargeable battery/battery designation	1.2 V Mignon AA
Length x width x height	122 x 65 x 22 mm
Memory (measurements) (PCS)	1974
42160...	Ident. No. 115

Prod. Gr. 423

ORION® Mobile UCI UCI-3000 hardness tester (DIN 50159)
 Separate manual sensor

Application:

For determining and directly displaying hardness values in line with HB (Brinell), HV (Vickers), HRA (Rockwell A), HRB (Rockwell B), HRC (Rockwell), HS (Shore) on metallic materials. Ideal for fine-grain materials and alloys. Includes 50 N standard probe for performing e.g. hardness tests on nitride-hardened, case-hardened and high-frequency-hardened parts and coating tests (from 30 microns with 10 N probe). Suitable test attachments are optionally available for curved surfaces.

- Memory for 12,900 measurements divisible into 100 blocks
- USB interface
- Software UCI 3000
- Further manual probes 10 N and 98 N are available upon request

Advantage:

- For all test devices without correction value input
- Standard conversion tables integrated in the device
- Hardness values are immediately displayed according to a pre-defined hardness scale
- 3 freely selectable scales for individual material adjustments

Delivery:

Display unit, standard probe 50 N, rechargeable battery, charger, USB connecting cable, CD with software for data transmission and evaluation in Excel, transport case



Execution:

- Includes separate 50 N manual probe, Vickers 136° indenter
- Manual probe 145 mm long
- Colour LCD display, backlit
- Individual, min./max and mean value display, with graphic diagrams
- Applied Vickers method in line with ASTM A 1038 or DIN 50159

Min./max. HV measuring range	240-940 HV
Min./max. HRC measuring range	20-70 HRC
Min./max. HB measuring range	90-460 HB
DIN	50159
Hardness accuracy	HB 4% HV 3% HRC 1.5%
Memory (measurements) (PCS)	12900
Hardness revolution	1 HB 1 HV 0.1 HRC 0.5 HRC 1 HRC 0.1 HRB 0.5 HRB 1 HRB
Testing method	Vickers
Vickers pyramid (Degree)	136
Min./max. working temperature	-10 to 40 °C
Display type	Colour LCD display
Backlight	Yes
Data transmission type	USB
Number of rechargeable batteries/batteries (PCS)	1
Rechargeable battery/battery designation	9 V block; 6LR61; 6AM6

42170... Ident. No. 610

Prod. Gr. 423

ORION® Cylindrical spring balances

Application:

For weighing components which can be fastened to a hook.

Execution:

- Spring balance suspended from a retaining ring
- Component attached by hook
- Not suitable for dynamic loads

- Blue anodised aluminium housing
- Brass inner tube with aluminium scale
- Error limit <= 1% of end value
- Overload protection up to approx. 10% above final value

Technical data:

- Diameter: 19.5 mm



Min./max. weight measuring range	0-0.2 kg	0-1 kg	0-2.5 kg	0-5 kg	0-10 kg	0-20 kg
Scale value, weight (kg)	0.02	0.1	0.25	0.5	1	2
Length (mm)	363	363	363	363	363	376
44216... Ident. No.	010	030	040	050	060	070

Prod. Gr. 443



ORION® Temperature measuring instrument with universal sensor

With universal probe

Application:

For simple temperature measurements in industrial applications

- Auto-off
- Switch between °C/°F
- Error limit ± 1% ±1°C

Execution:

- Watertight
- HOLD function

Notes:

Can only be used with supplied sensor up to 550°



Min./max. temperature measuring range	-64 to 1370 °C
Digit increment (measuring instrument for temperature) (°C)	0.1
Length x width x height	78 x 43 x 20 mm
46105...	Ident. No. 200

Prod. Gr. 456

ORION® Temperature measuring instruments

2-channel and 4-channel

Application:

For measuring temperature differences

- 4 simultaneous measurements
- Configuration via software or logger keyboard
- Data logger function for storing 16,000 measurements
- Backlight
- Error limit ± 0.3% ±1.0°C

Execution:

- Displays differential temperature
- USB interface
- Input for thermocouple, type K
- Digit increment 0.1°C from -199.9°..+199.9°C, otherwise 1.0°C
- **Ident. No. 220:**
 - 2 simultaneous measurements
 - Error limit ± 0.1% ±0.7°C
- **Ident. No. 240:**

Delivery:

Ident. No. 220: Measuring instrument, battery, 2x type K thermocouple wire, length 90 cm, measuring range -50° to +200°, operating instructions

Ident. No. 240: Measuring instrument, battery, software, readout cable, 2x type K thermocouple wire, length 90 cm, measuring range -50° to +200°, operating instructions



Ident. No. 220



Ident. No. 240

Min./max. temperature measuring range	-200 to 1370 °C
Length x width x height	184 x 64 x 30 mm
46105...	Ident. No. 220
46105...	Ident. No. 240

Prod. Gr. 456

ORION® Data logger for temperature and humidity

Application:

For environmental monitoring, e.g. during transportation and storage

- Memory for up to 60,000 measured values with 3 variables
- Measuring interval adjustable from 1 second up to 24 hours
- High accuracy: ±0.5°C/± 3%
- **Ident. No. 020:** Additional measurement of relative air humidity and dew point

Execution:

- Large display for current value indication and
- External temperature sensor connection
- Battery status indication
- User-friendly Windows software
- Hi-Lo visual and acoustic alarm

Delivery:

USB data cable, Windows software on CD and battery (1x 3 V lithium type CR2032)

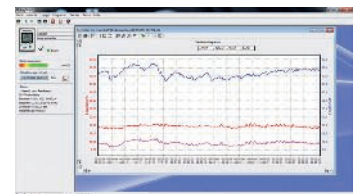


Data logger with temperature probes

Min./max. temperature measuring range	-30 to 70 °C	-30 to 70 °C
Digit increment (measuring instrument for temperature) (°C)	0.1	0.1
Temperature error limit (residual area) (°C)	0.7	0.7
Min./max. humidity (rF) of measuring range	-	0-99 %
IP protection class	IP 65	-
46200...	Ident. No. 010	020

Prod. Gr. 456

Accessories for		46200 010	46200 020
46200...	Temperature sensor, 40 x 3 mm, length 3 m	Ident. No. 103	103
46200...	Temperature sensor, 40 x 3 mm, length 8 m	Ident. No. 108	108



ORION® Infrared temperature measuring instruments

Application:

For measuring surface temperatures of rotating or live components

Execution:

- Error limit $\pm 2\%$ or $\pm 2^\circ\text{C}$
- **Ident. No. 021:**
 - HOLD/max./min./difference
 - HI/LO limit value alarm
 - Unit: Can be switched between $^\circ\text{C}/^\circ\text{F}$
 - Display with backlight (optional activation)
 - Adjustable emission degree 0.10 to 1.00
 - Dot laser (Class II) sighting aid (optional activation)
 - Input for NiCr-Ni thermoelement sensor (type K)
- **Ident. No. 041:**
 - HOLD/max./min./difference, additionally with AVG (average from measurement series) and lock (continuous measurement)
 - HI/LO limit value alarm
 - Unit: Can be switched between $^\circ\text{C}/^\circ\text{F}$

- Display with backlight (optional activation)
- Adjustable emission degree 0.10 to 1.01
- Dot laser (Class II) sighting aid (optional activation), with 2 laser beams to mark the measuring field size
- Input for NiCr-Ni thermoelement sensor (type K)
- **Ident. No. 045:**
 - IP 54 splash-proof
 - Large backlit display for simultaneous visualization of measured values, max. and limit values
 - Two laser beams for indicating the measuring field size
 - LOCK function (continuous measurement)
 - Response time < 1 second
 - HOLD /max. function
 - Battery life 18 hours in continuous operation
 - Adjustable acoustic alarm

Delivery:
With battery in case.



Ident. No. 021



Ident. No. 041



Ident. No. 045

Min./max. temperature measuring range	-60 to 500 °C	-50 to 1000 °C	-60 to 550 °C
Digit increment (measuring instrument for temperature) (°C)	0.1	0.1	0.1
Min./max. emission ratio	-	-	0.1-1.0
Optical focus	11:1	50:1	12:1
Rechargeable battery/battery designation	1.5 V Mignon AA	9 V block	Micro AAA
46135...	Ident. No. 021	041	045

Prod. Gr. 456

ORION®

Application:

For non-contact measuring of dew points and surface temperatures. Ideal for indoor climate specialists. Indoor climate measurements

Execution:

- Double target laser
- HOLD, MAX, MIN functions
- Switch display between $^\circ\text{C}/^\circ\text{F}$
- USB port
- Error limit $\pm 2\%$ or $\pm 2^\circ\text{C}$

Advantage:

- Large 2.2 inch TFT colour display
- Input for thermocouple sensor NiCrNi (type K)
- Large measured value memory (micro-SD card slot)
- IR temperature measuring device with integrated humidity sensor
- Applications are displayed as JPG images with measured values and date stamps

Delivery:

Sturdy transport case, USB cable, mains plug with USB connection, incl. temperature sensor TYP K, small camera tripod



Min./max. temperature measuring range	-50 to 1000 °C
Optical focus	50:1
46135...	Ident. No. 100

Prod. Gr. 456

ORION® Temperature/humidity measuring instrument

Application:

For measuring indoor climates

Execution:

- Running display
- Max-hold display
- Min-hold display
- Energy-saving Auto-OFF function

Advantage:

- Handy device size and easy one-hand operation
- Automatic display illumination with brightness sensor

- Large digits for clear view of measured values

Delivery:

Battery (1x 9 V block battery, type 6 LR 61)

Technical data:

- Min./max. temperature measuring range: -20 to 60 °C
- Temperature error limit: 0.5 °C
- Min./max. humidity (rF) of measuring range: 0-99 %
- Humidity (rF) error limit/conditions: 5 % / from 20 to 70%
- Humidity (rF) error limit, residual area: 7 %



46210...

Ident. No.

010

Prod. Gr. 456

ORION® Flow meter (anemometer)

Application:

For simple measurements of air-conditioning ventilation systems.

Execution:

- Running display
- Max-hold display
- AVG display (average value)
- Switch between units of display: m/s, km/h, ft/ min., MPH, knots
- Energy-saving Auto-OFF function

Advantage:

- Handy device size and easy one-hand operation

- Automatic display illumination with brightness sensor
- Large digits for clear view of measured values

Delivery:

Battery (1x 9 V block battery, type 6 LR 61)

Technical data:

- Min./max. current of measuring range: 0.4-25 m/s
- Digit increment, current: 0.01 m/s
- Current error limit (+/-): 0.45 m/s
- Min./max. working temperature: 0 to 40 °C



46210...

Ident. No.

020

Prod. Gr. 456

ORION® Light intensity measuring instrument (luxmeter)

Application:

For monitoring lighting conditions in workplaces, warehouses, industrial buildings and residential buildings.

Execution:

- Automatic zero point calibration
- Max-hold display
- Switch between units of display: LUX Fc
- Energy-saving Auto-OFF function

Advantage:

- Handy device size and easy one-hand operation

- Automatic display illumination with brightness sensor
- Large digits for clear view of measured values

Delivery:

Battery (1x 9 V block battery, type 6 LR 61)

Technical data:

- Digit increment, illumination: 0.01 lx
- Illumination error limit (+/-): 5 lx
- Min./max. working temperature: 0 to 40 °C



46210...

Ident. No.

030

Prod. Gr. 456

ORION® Sound level measuring instrument

Application:

For monitoring permissible noise pollution levels, e.g. in workplaces.

Execution:

- Running display
- Max-hold display
- Min-hold display
- Energy-saving Auto-OFF function

Advantage:

- Handy device size and easy one-hand operation

- Automatic display illumination with brightness sensor
- Large digits for clear view of measured values

Delivery:

Battery (1x 9 V block battery, type 6 LR 61)

Technical data:

- Min./max. sound-pressure-level measuring range: 40-130 dB
- Digit increment, sound-pressure level: 0.1 dB
- Sound-pressure-level error limit (+/-): 3.5 dB
- Min./max. working temperature: 0 to 40 °C



46210...

Ident. No.

040

Prod. Gr. 456

ORION® Electronic stopwatches

Application:

For universal timing using different functions.

- 10 memory slots

Execution:

- Black plastic housing
- LCD display
- Digit increment 1/100

No. 39070:

- Functions: Time per lap, number of laps, split time, fastest/slowest time/average lap time

Technical data:

- Acoustic signal: Yes
- With timing: Yes
- With forward/reverse counting: Yes
- With time indicator: Yes
- With date and weekday indicator: Yes
- Width: 64 mm
- Height: 86 mm



No. 39070



No. 39082

Digit height (mm)	39070... Ident. No.	39082... Ident. No.
6	010	-
11	-	010

Prod. Gr. 301

ORION® Electronic hand-held tachometer

Application:

For non-contact rotational speed measurement

- Shutdown: automatically 30 s after last key press, measured value saved
- Housing: Plastic with holster

Execution:

- Non-contact measurement using a red, modulated light beam and a reflection marker
- 5 digit LCD display
- Error limit: 0.02% of display value (± 1 digit increment)
- Update time: 1 s
- Measuring distance: optical max. 600 mm
- Memory function: last value measured, maximum value, minimum value, mean

Delivery:

Case with basic device, reflection markers, 2 x 1.5 V AA batteries, calibration certificate, operating instructions

Technical data:

- Max. measurement distance: 600 mm
- Error limit (%): 0.02 %



39350...

Ident. No.	025
	•

Prod. Gr. 301

ORION® Quantity counter

Application:

For manually recording quantities at the push of a button, e.g. for counting production batches.

Execution:

- Die-cast zinc housing
- Front cap and base made from durable plastic

Ident. No. 010:

- Handheld piece counter with retaining ring
- Zero setting using knurled knob

Ident. No. 020:

- Piece counter with mounting base for table-top or wall mounting
- Hole pattern for bench mounting: Hole diameter 4.2 mm, hole spacing 50 mm
- Hole pattern for wall mounting: Hole diameter 4.2 mm, hole spacing 52 mm

Technical data:

- Max. display value: 9999
- Number of digits: 4 PCS
- Digit height: 4.5 mm





Ident. No. 010



Ident. No. 020




Width (mm)		52	62
Height (mm)		55	59
Depth (mm)		26	33
48450...	Ident. No.	010	020


Prod. Gr. 394



Workshop equipment	
	Workbench vices
	Screw clamps

Screwdrivers	
	Open-end spanners and box wrenches
	Socket wrenches, 1/4 inch
	Socket wrench 3/8 inch
	Socket wrenches, 1/2 inch
	Slotted and Phillips screwdrivers
	Pipe socket spanners

Hand tools	
	Gripping pliers
	Water pump pliers
	Cutting pliers
	Stripping and crimping tools
	Hammers
	Striking tools
	Scribers

Hand tools	
	Hand saws
	Cutters
	Riveting tools

Welding and soldering	
	Braze

General requirements	
	Inspection devices
	Holding magnets and small magnets
	Oil dispensers
	Grease presses
	Painting requirements, lever and lifting devices
	Brushes and brooms
	Labelling
	Tool bags
	Tool assortments

ORION® Tool holders

Application:

For clamping tools with a round shank

Execution:

- **No. 51000:**
 - With perforated, nickel-plated brass grip
 - Brass chuck and grip

▪ **No. 51002:**

- With nickel-plated brass grip
- Two interchangeable clamping jaws

▪ **No. 51003:**

- With plastic grip
- Steel chuck and union nut



No. 51000



No. 51002



No. 51003

Min./max. clamping width	0-1 mm	1-2 mm	0-3.2 mm	2-3 mm	3-4.5 mm	4-6 mm
Length (mm)	74	74	100	135	150	165
Shaft Ø (mm)	6	6	9	15	17	18
	51000...	51000...	51002...	51003...	51003...	51003...
	Ident. No.	Ident. No.	Ident. No.	Ident. No.	Ident. No.	Ident. No.
	010	020	110	200	205	210

Prod. Gr. 510

ORION® Tool holders

With ratchet, all-steel finish

Application:

For mounting tools with square shank.

- Movable T-handle
- Ratchet function, reversible

Execution:

- Dual-jaw chuck with hardened jaws
- Chrome-plated and polished surface

Advantage:

- Clockwise/anti-clockwise rotation and rigid application



Min./max. clamping width of square	2-5 mm	2-5 mm	4.6-8 mm	4.6-8 mm	9-12.5 mm
Suitable for min./max. screw tap	M3-M8	M3-M8	M5-M12	M5-M12	M13-M20
Length (mm)	85	250	110	300	117
	51005...	520	510	530	540
	Ident. No.				

Prod. Gr. 510

ORION® Grooving vice

Forged steel

Application:

For clamping and holding smaller workpieces.

Execution:

- Made of steel, forged
- With slanting jaw
- With captive bracing spring



Jaws width (mm)	28
Length (mm)	125
51013...	Ident. No. 500

Prod. Gr. 510

ORION® Hand vice

Forged steel

Application:

For clamping and holding smaller workpieces.

Execution:

- Made of steel, forged
- With trapezoidal spindle and wing nut
- With captive bracing spring



Jaws width (mm)	36	40	42	48	52	55
Length (mm)	100	120	130	145	160	180
	51016...	520	530	540	550	560
	Ident. No.					

Prod. Gr. 510

ORION® Parallel vice

Fixed jaws, front opening action

Execution:

- Made of steel, forged
- Hardened, ribbed and fixed steel jaws
- Adjustable guide

- Spindle protected from dirt and damage by covering
- Hardened anvil surface

Advantage:

- Mounting holes for pipe clamping jaws

- Technical data:**
- Colour: Blue



Jaws width (mm)	100	125	150
Min./max. clamping width	0-125 mm	0-150 mm	0-200 mm
Clamp in depth (mm)	65	80	95
Weight (kg)	7.0	11.0	17.0
51063...	Ident. No. 011	026	051

Prod. Gr. 586

Accessories for			51063 011	51063 026	51063 051
51063...	Rotary base	Ident. No.	100	125	150
51063...	Pipe clamping jaws	Ident. No.	200	225	250

ORION® Parallel clamp

Application:

For clamping a wide variety of workpiece shapes.

- Clamping jaws with four different surfaces: Smooth, ribbed, cross-over and v-block
- Galvanised bar

Execution:

- With fine-threaded spindle
- Swivel-mounted clamping jaws

- Advantage:**
- Precise and powerful clamping



Min./max. clamping width		0-25 mm	0-50 mm	0-75 mm	0-100 mm	0-150 mm
Width of clamping jaw (mm)		11	16	19	19	22
51115...	Ident. No.	001	002	003	004	005

Prod. Gr. 598

ORION® Single open-end wrench (DIN 894)

15° jaw angle

Execution:

- Special steel
- Strong shank with double-T profile

Technical data:

- Jaw position: 15 Degree
- Surface: Burnished
- Material: Chrome-vanadium steel

**Advantage:**

- Shaft profile creates excellent bending rigidity
- Good force transfer
- Non-slip feel

Width across flats	6 mm	7 mm	8 mm	9 mm	10 mm	11 mm	12 mm	13 mm
Length (mm)	75	80	95	100	105	110	125	130
Thickness (mm)	3.2	3.2	3.5	4	4.5	5	5	5.5
52002... Ident. No.	006	007	008	009	010	011	012	013
Width across flats	14 mm	15 mm	16 mm	17 mm	18 mm	19 mm	22 mm	24 mm
Length (mm)	140	145	155	160	160	170	195	215
Thickness (mm)	5.5	5.5	5.5	6	6	7	8	9
52002... Ident. No.	014	015	016	017	018	019	022	024
Width across flats	25 mm	27 mm	30 mm	32 mm	36 mm	38 mm	41 mm	46 mm
Length (mm)	215	240	260	275	305	305	345	380
Thickness (mm)	9	10	11	12	13	13	14	15
52002... Ident. No.	025	027	030	032	036	038	041	046
Width across flats	50 mm	55 mm	60 mm	65 mm	70 mm	75 mm	80 mm	85 mm
Length (mm)	415	460	495	530	575	610	645	690
Thickness (mm)	16	17	18	19	20	21	22	23
52002... Ident. No.	050	055	060	065	070	075	080	085
Width across flats	90 mm	95 mm	100 mm	105 mm	110 mm			
Length (mm)	740	740	800	850	900			
Thickness (mm)	25	25	26	28	28			
52002... Ident. No.	090	095	100	105	110			

Prod. Gr. 526

ORION® Double open-end wrench (DIN 895)

Jaw angle 15° at both ends

Execution:

- Special steel
- Strong shank with double-T profile

- Non-slip feel

Technical data:

- Jaw position: 15 Degree
- Material: Chrome-vanadium steel
- Surface: Burnished

**Advantage:**

- Shaft profile creates excellent bending rigidity
- Good force transfer

Width across flats	6 x 7 mm	7 x 8 mm	8 x 9 mm	8 x 10 mm	9 x 11 mm	10 x 11 mm	10 x 13 mm	11 x 13 mm
Length (mm)	96	108	108	115	124	124	140	140
Thickness (mm)	3.3	4	4	4.5	5	5	5	5.5
52008... Ident. No.	010	020	040	050	080	090	110	130
Width across flats	12 x 13 mm	12 x 14 mm	13 x 14 mm	13 x 15 mm	13 x 17 mm	14 x 15 mm	14 x 17 mm	16 x 17 mm
Length (mm)	140	140	140	155	160	155	160	160
Thickness (mm)	5.5	5.5	5.5	5.5	6	5.5	6	6
52008... Ident. No.	150	160	170	180	190	195	200	205
Width across flats	16 x 18 mm	17 x 19 mm	17 x 22 mm	18 x 19 mm	18 x 21 mm	19 x 22 mm	19 x 24 mm	20 x 22 mm
Length (mm)	170	170	195	170	195	195	205	195
Thickness (mm)	6.5	7	8	7	8	8	9	8
52008... Ident. No.	208	210	220	225	228	230	240	245
Width across flats	21 x 23 mm	22 x 24 mm	22 x 27 mm	24 x 27 mm	24 x 30 mm	25 x 28 mm	27 x 30 mm	27 x 32 mm
Length (mm)	220	220	235	245	270	245	275	275
Thickness (mm)	9	9	10	10	11	10	12	11
52008... Ident. No.	247	250	260	270	280	285	290	300
Width across flats	30 x 32 mm	30 x 36 mm	32 x 36 mm	36 x 41 mm	41 x 46 mm	46 x 50 mm	50 x 55 mm	55 x 60 mm
Length (mm)	275	305	310	345	380	420	460	500
Thickness (mm)	12	13	14	14	15	16	17	18
52008... Ident. No.	310	320	330	340	350	360	370	380

Prod. Gr. 526

ORION® Double open-end wrench (DIN 3110)

Jaw angle 15° at both ends

Technical data:

- Jaw position: 15 Degree
- Material: Chrome-vanadium steel
- Surface: Chrome-plated



Width across flats	6 x 7 mm	8 x 9 mm	8 x 10 mm	10 x 11 mm	10 x 13 mm	12 x 13 mm	13 x 15 mm	13 x 17 mm
Length (mm)	125	142	140	157	172	173	188	205
Thickness (mm)	3.5	3.9	4.2	4.5	5.0	5.0	5.5	5.8
52017... Ident. No.	040	060	070	105	110	150	180	190
Width across flats	14 x 15 mm	16 x 17 mm	17 x 19 mm	18 x 19 mm	19 x 22 mm	20 x 22 mm	22 x 24 mm	24 x 27 mm
Length (mm)	188	205	210	222	233	236	249	266
Thickness (mm)	5.5	6.0	6.5	6.5	7.0	7.0	7.8	8.0
52017... Ident. No.	200	220	230	240	250	270	290	320
Width across flats	30 x 32 mm							
Length (mm)	304							
Thickness (mm)	9.0							
52017... Ident. No.	380							

Prod. Gr. 526

ATORN® ORION® Double open-end wrench sets (DIN 3110)

Jaw angle 15° at both ends

Advantage:

- Range of the most common double open-end wrenches to suit practical demands

Technical data:

- Jaw position: 15 Degree
- Surface: Chrome-plated
- Material: Chrome-vanadium steel



No. 52009 870

Width across flats	Number of pieces in assortment/set (PCS)	ATORN®		ORION®	
		52009... Ident. No.		52017... Ident. No.	
6 x 7 mm 8 x 9 mm 10 x 11 mm 12 x 13 mm 14 x 15 mm 16 x 17 mm 18 x 19 mm 20 x 22 mm	8	850	•	850	•
6 x 7 mm 8 x 9 mm 10 x 11 mm 12 x 13 mm 14 x 15 mm 16 x 17 mm 18 x 19 mm 20 x 22 mm 24 x 27 mm 30 x 32 mm	10	860	•	860	•
6 x 7 mm 8 x 9 mm 10 x 11 mm 10 x 13 mm 12 x 13 mm 14 x 15 mm 16 x 17 mm 17 x 19 mm 18 x 19 mm 20 x 22 mm 24 x 27 mm 30 x 32 mm	12	870	•	870	•

ATORN® = Prod. Gr. 5HB

ORION = Prod. Gr. 526

ORION® Combination wrenches (DIN 3113)

Jaw angle 15°, ring side angled 15°

Technical data:

- Tip profile type: Standard profile
- Jaw position: 15 Degree

- Surface: Chrome-plated
- Material: Chrome-vanadium steel



Width across flats	6 mm	7 mm	8 mm	9 mm	10 mm	11 mm	12 mm	13 mm
Length (mm)	100	110	120	130	140	150	160	170
52037... Ident. No.	060	070	080	090	100	110	120	130
Width across flats	14 mm	15 mm	16 mm	17 mm	18 mm	19 mm	20 mm	22 mm
Length (mm)	180	190	190	210	210	230	230	260
52037... Ident. No.	140	150	160	170	180	190	200	220
Width across flats	24 mm	27 mm	30 mm	32 mm				
Length (mm)	280	310	340	360				
52037... Ident. No.	240	270	300	320				

Prod. Gr. 526

ATORN® ORION® Combination wrench sets, metric (DIN 3113)

Jaw angle 15°, ring side angled 15°

Advantage:

- Practical range of various combination wrenches with the most common wrench sizes

Technical data:

- Jaw position: 15 Degree
- Tip profile type: ENERGY profile
- Surface: Chrome-plated
- Material: Chrome-vanadium steel



No. 52034 684

Width across flats	Number of pieces in assortment/set (PCS)	ATORN®		ORION®	
		52034... Ident. No.		52037... Ident. No.	
8 mm 9 mm 10 mm 11 mm 13 mm 14 mm 17 mm 19 mm	8	670	•	670	•
6 mm 7 mm 8 mm 9 mm 10 mm 11 mm 12 mm 13 mm 14 mm 17 mm 19 mm 22 mm	12	680	•	680	•
10 mm 11 mm 12 mm 13 mm 14 mm 17 mm 19 mm 22 mm 24 mm 27 mm 30 mm 32 mm	12	684	•	684	•
6 mm 7 mm 8 mm 9 mm 10 mm 11 mm 12 mm 13 mm 14 mm 15 mm 16 mm 17 mm 18 mm 19 mm 20 mm 22 mm 24 mm	17	690	•	690	•

ATORN® = Prod. Gr. 5HB
ORION = Prod. Gr. 526

ORION® Double ring wrench (DIN 838)

deep offset on both sides

Execution:

- Drop-forged

Advantage:

- Shaft profile creates excellent bending rigidity
- Deep offset makes it easier to work in hard-to-reach places

Technical data:

- Tip profile type: Standard profile
- Surface: Chrome-plated
- Material: Chrome-vanadium steel



Width across flats	6 x 7 mm	8 x 9 mm	10 x 11 mm	10 x 13 mm	12 x 13 mm	14 x 15 mm	16 x 17 mm	17 x 19 mm
Length (mm)	178	195	200	220	220	235	250	285
52059... Ident. No.	060	080	100	105	120	140	160	170
Width across flats	18 x 19 mm	20 x 22 mm	24 x 27 mm	30 x 32 mm				
Length (mm)	285	300	330	360				
52059... Ident. No.	180	200	240	300				

Prod. Gr. 526

ATORN® ORION® Double ring wrench sets (DIN 838)

Deep offset on both sides

Advantage:

- No. 52055:**
 - Energy profile increases the force application areas for optimum load distribution
 - Gentle on the bolt/nut and tool

- Even slightly damaged heads can still be screwed on

Technical data:

- Surface: Chrome-plated
- Material: Chrome-vanadium steel



No. 52055 800

Width across flats	Number of pieces in assortment/set (PCS)	ATORN®		ORION®	
		52055... Ident. No.		52059... Ident. No.	
6 x 7 mm 8 x 9 mm 10 x 11 mm 12 x 13 mm 14 x 15 mm 16 x 17 mm 18 x 19 mm 20 x 22 mm	8	790	•	790	•
6 x 7 mm 8 x 9 mm 10 x 11 mm 12 x 13 mm 14 x 15 mm 16 x 17 mm 18 x 19 mm 20 x 22 mm 24 x 27 mm 30 x 32 mm	10	800	•	800	•
6 x 7 mm 8 x 9 mm 10 x 11 mm 10 x 13 mm 12 x 13 mm 14 x 15 mm 16 x 17 mm 17 x 19 mm 18 x 19 mm 20 x 22 mm 24 x 27 mm 30 x 32 mm	12	810	•	810	•

ATORN® = Prod. Gr. 5HB
ORION = Prod. Gr. 526

ORION® Socket spanner sets

With hexagon inserts, 1/4 inch square drive 6.3 DIN 3120

Execution:

- Chrome-vanadium steel
- Chrome-plated
- **Ident. No. 010:** 11 socket wrench inserts, 5 operating tools



Ident. No. 010

- **Ident. No. 020:** 35 socket wrench inserts, 5 operating tools
- **Ident. No. 030:** 27 socket wrench inserts, 4 operating tools

Delivery:

In painted metal case



Ident. No. 020



Ident. No. 030

Drive	1/4 inch	1/4 inch	1/4 inch
Number of pieces in assortment/set (PCS)	16	40	31
Sockets with hexagon-head tip provided	4 mm 4.5 mm 5 mm 5.5 mm 6 mm 7 mm 8 mm 9 mm 10 mm 11 mm 13 mm	4 mm 4.5 mm 5 mm 5.5 mm 6 mm 7 mm 8 mm 9 mm 10 mm 11 mm 12 mm 13 mm 14 mm	4 mm 4.5 mm 5 mm 5.5 mm 6 mm 7 mm 8 mm 9 mm 10 mm 11 mm 12 mm 13 mm
Sockets with socket hexagon-head tip provided	-	3 mm 4 mm 5 mm 6 mm	4 mm 5 mm 6 mm
Sockets with socket hexagon head or external TX tip provided	-	TX8 TX9 TX10 TX10 TX15 TX20 TX25 TX27 TX30 TX40	TX10 TX15 TX20
Sockets with cross-head tip provided	-	PH1 PH2 PH3 PZ1 PZ2 PZ3	PH1 PH2 PH3 PZ1 PZ2 PZ3
Sockets with slotted tip provided	-	3 mm 4 mm 6 mm	4 mm 5 mm 6 mm
Ratchets provided	1/4-inch square	1/4-inch square	1/4-inch square
Extensions provided	100 mm	50 mm	50 mm
Drive handle provided	150 mm	150 mm	-
Cross handles provided	115 mm	115 mm	115 mm
Cardan joints provided	35 mm	35 mm	35 mm
External dimensions of box	195 x 105 x 33 mm	330 x 170 x 55 mm	230 x 140 x 40 mm
58010...	Ident. No. 010	020	030

Prod. Gr. 526

ORION® Socket spanner sets

1/4 inch and combination set 1/4+3/8+1/2 inch

Execution:

- Chrome-vanadium steel
- **Ident. No. 100:** With flexible 145-mm extension

Advantage:

- High-quality insertion tools to robust, long-lasting industry-standard specification

- Reversible ratchet with two-component handle and locking button
- Individual parts are securely stored and transported using clamping function
- Any missing tools are instantly detected thanks to size-related tool recesses

Delivery:

In impact-resistant plastic box



Ident. No. 100



Ident. No. 500

Drive	1/4 inch	1/4 inch 3/8 inch 1/2 inch
Number of pieces in assortment/set (PCS)	46	172
Sockets with hexagon-head tip provided	4 mm 4.5 mm 5 mm 5.5 mm 6 mm 7 mm 8 mm 9 mm 10 mm 11 mm 12 mm 13 mm 14 mm	4 mm 4.5 mm 5 mm 5.5 mm 6 mm 7 mm 8 mm 9 mm 10 mm 11 mm 12 mm 13 mm 14 mm 15 mm 16 mm 17 mm 18 mm 19 mm 20 mm 21 mm 22 mm 24 mm 27 mm 30 mm 32 mm
Long sockets with hexagon-head tip provided	-	16 mm 18 mm 21 mm
Sockets with socket hexagon-head tip provided	3 mm 4 mm 5 mm 6 mm 7 mm 8 mm	3 mm 4 mm 5 mm 6 mm 7 mm 8 mm 10 mm 12 mm 14 mm
Sockets with socket hexagon head or external TX tip provided	TX10 TX15 TX20 TX25 TX30 TX40	TX8 TX9 TX10 TX15 TX20 TX25 TX27 TX30 TX40 TX45 TX50 TX55 TX60 TX70 E4 E5 E6 E7 E8 E10 E11 E12 E14 E16 E18
Sockets with cross-head tip provided	PH1 PH2 PH3 PZ1 PZ2 PZ3	PH0 PH1 PH2 PH3 PH4 PZ0 PZ1 PZ2 PZ3 PZ4
Sockets with slotted tip provided	4 mm 5.5 mm 7 mm	4 mm 5 mm 6.5 mm 7 mm 8 mm 10 mm 12 mm
Ratchets provided	1/4-inch square	3/8-inch square 1/4-inch square 1/2-inch square
Extensions provided	50 mm 100 mm 145 mm	50 mm 100 mm 125 mm 250 mm
Drive handle provided	150 mm	150 mm
Cross handles provided	115 mm	115 mm
Cardan joints provided	35 mm	34 mm 48 mm 70 mm
Bit holder provided	1/4 inch	1/4 inch
External dimensions of box	-	420 x 350 x 100 mm
58010...	Ident. No. 100	500

Prod. Gr. 526

ORION® Adapter set (DIN 3123) 6-piece

Application:

For universal use of 1/4" up to 3/4" square

Advantage:

- Individual parts are securely stored and transported using clamping function
- Any missing tools are instantly detected thanks to size-related tool recesses



Drive	1/4 inch 3/8 inch 1/2 inch 3/4 inch
Tip size	1/4 inch 3/8 inch 1/2 inch 3/4 inch
Surface	Chrome-plated
Material	Chrome-vanadium steel
Number of pieces in assortment/set (PCS)	6
58010...	Ident. No. 600

Prod. Gr. 526

ORION® Ratchet (DIN 3122) 1/4" square drive 6.3, DIN 3120

Execution:

- Anti-clockwise and clockwise rotation possible using reversing lever with locking button



Tip size	1/4 inch
Length (mm)	150
Number of teeth (PCS)	72
Surface	Chrome-plated
Material	Chrome-vanadium steel
58274...	Ident. No. 500

Prod. Gr. 526

ORION® Socket wrench set With hexagon inserts, 3/8 inch square drive 10 DIN 3120

Execution:

- Chrome-vanadium steel
- Ident. No. 010:**
 - Matt chromium-plated
 - 17 inserts, 6 operating tools

Advantage:

- Ident. No. 100:**
 - High-quality insertion tools to robust, long-lasting industry-standard specification
 - Reversible ratchet with two-component handle and locking button
 - Individual parts are securely stored and transported using clamping function



Ident. No. 010

Ident. No. 100

Drive	3/8 inch	3/8 inch
Number of pieces in assortment/set (PCS)	23	61
Sockets with hexagon-head tip provided	6 mm 7 mm 8 mm 9 mm 10 mm 11 mm 12 mm 13 mm 14 mm 15 mm 16 mm 17 mm 18 mm 19 mm 20 mm 21 mm 22 mm	6 mm 7 mm 8 mm 9 mm 10 mm 11 mm 12 mm 13 mm 14 mm 15 mm 16 mm 17 mm 18 mm 19 mm 20 mm 21 mm 22 mm 24 mm
Long sockets with hexagon-head tip provided	-	8 mm 9 mm 10 mm 11 mm 12 mm 13 mm 14 mm 15 mm 17 mm 19 mm
Sockets with socket hexagon-head tip provided	-	3 mm 4 mm 5 mm 6 mm 7 mm 8 mm 10 mm
Sockets with socket hexagon head or external TX tip provided	-	TX15 TX20 TX25 TX27 TX30 TX40 TX45 TX50 TX55
Sockets with cross-head tip provided	-	PH1 PH2 PH3 PZ1 PZ2 PZ3
Sockets with slotted tip provided	-	5.5 mm 7 mm 8 mm
Ratchets provided	3/8-inch square	3/8-inch square
Extensions provided	125 mm 250 mm	75 mm 250 mm
Cross handles provided	170 mm	170 mm
Cardan joints provided	46 mm	-
External dimensions of box	270 x 105 x 90 mm	-
58279...	Ident. No. 010	Ident. No. 100

Prod. Gr. 526

ORION® Socket spanner sets

With hexagon inserts, 1/2 inch square drive 12.5 DIN 3120

Execution:

- Chrome-vanadium steel
- Matt chromium-plated
- **Ident. No. 010:** 11 inserts, 2 operating tools

▪ **Ident. No. 050:** 19 inserts, 5 operating tools

Delivery:

In painted metal case



Ident. No. 010

Ident. No. 050

Drive	1/2 inch	1/2 inch
Number of pieces in assortment/set (PCS)	13	24
Sockets with hexagon-head tip provided	8 mm 10 mm 11 mm 12 mm 13 mm 14 mm 15 mm 16 mm 17 mm 19 mm 22 mm	8 mm 10 mm 11 mm 12 mm 13 mm 14 mm 15 mm 16 mm 17 mm 19 mm 21 mm 22 mm 23 mm 24 mm 26 mm 27 mm 28 mm 30 mm 32 mm
Ratchets provided	1/2-inch square	1/2-inch square
Extensions provided	125 mm	125 mm 250 mm
Cardan joints provided	-	70 mm
External dimensions of box	320 x 150 x 50 mm	450 x 200 x 50 mm
58575...	Ident. No. 010	050

Prod. Gr. 526

ORION® Socket spanner sets

With hexagon inserts, 1/2 inch square drive 12.5 DIN 3120

Execution:

- Chrome-vanadium steel
- **Ident. No. 200:** Ratchet with 2-component handle and locking button
- **Ident. No. 300:** Hexagon socket driver lengths: 55, 100, 140 and 200 mm

Advantage:

- High-quality insertion tools to robust, long-lasting industry-standard specification
- Individual parts are securely stored and transported using clamping function
- Any missing tools are instantly detected thanks to size-related tool recesses



Ident. No. 200

Ident. No. 300

Drive	1/2 inch	1/2 inch
Number of pieces in assortment/set (PCS)	25	30
Sockets with hexagon-head tip provided	10 mm 11 mm 12 mm 13 mm 14 mm 15 mm 16 mm 17 mm 18 mm 19 mm 20 mm 21 mm 22 mm 23 mm 24 mm 27 mm 30 mm 32 mm	-
Long sockets with hexagon-head tip provided	16 mm 21 mm	-
Sockets with socket hexagon-head tip provided	-	5 mm 6 mm 7 mm 8 mm 10 mm 11 mm 12 mm 13 mm 14 mm 17 mm 19 mm
Ratchets provided	1/2-inch square	-
Extensions provided	125 mm 250 mm	-
Cross handles provided	300 mm	-
Cardan joints provided	70 mm	-
58575...	Ident. No. 200	300

Prod. Gr. 526

ORION® Ratchet

Reversible, 1/2" square drive, 12.5, DIN 3120

Execution:

- Anti-clockwise and clockwise rotation possible using reversing lever with locking button



Tip size	1/2 inch
Length (mm)	250
Number of teeth (PCS)	72
Surface	Chrome-plated
Material	Chrome-vanadium steel
Material of the grip handle	2-component plastic
58899...	Ident. No. 500

Prod. Gr. 526

ORION® Slotted screwdrivers

Circular blade

Execution:

- Two-component grip with large soft area
- Cross hole

- High degree of torque transmission

- Cross hole for hanging up or inserting a lever



Advantage:

- Ergonomic, effortless work

Technical data:

- Material of the grip handle: 2-component plastic

Width of cutting edge (mm)	2.5	3	3.5	4	5.5	6.5	8	10	12	
Thickness of cutting edge (mm)	0.4	0.5	0.6	0.8	1.0	1.2	1.2	1.6	2.0	
Blade length (mm)	75	75	100	100	125	150	175	200	250	
Length (mm)	135	155	175	185	220	255	290	315	355	
52752...	Ident. No.	025	030	035	040	055	065	080	100	120
		●	●	●	●	●	●	●	●	●

Prod. Gr. 5LA

ORION® Slotted and Phillips screwdriver sets

Circular blade

Execution:

- Two-component grip with large soft area
- Cross hole

Advantage:

- Ergonomic, effortless work
- High degree of torque transmission
- Cross hole for hanging up or inserting a lever



Ident. No. 200

Composition of set	Supplied blade widths: 4 mm/5.5 mm/6.5 mm	Supplied blade widths: 3.5 mm/4 mm/5.5 mm/6.5 mm/8 mm	Supplied blade widths: 2.5 mm/3 mm/3.5 mm/4 mm/5.5 mm/6.5 mm/8 mm/10 mm	
Number of pieces in assortment/set	5	5	8	
Tip size	PH1 PH2	-	-	
52752...	Ident. No.	200	230	250
		●	●	●

Prod. Gr. 5LA

ORION® Phillips screwdrivers (ISO 8764)

with PH and PZ drives

Execution:

- Two-component grip with large soft area
- Cross hole

- High degree of torque transmission

- Cross hole for hanging up or inserting a lever



Ident. No. 005-030

Advantage:

- Ergonomic, effortless work

Technical data:

- Material of the grip handle: 2-component plastic



Ident. No. 105-130

Tip size	PH0	PH1	PH2	PH3	PZ0	PZ1	PZ2	PZ3	
Blade length (mm)	60	80	100	150	60	80	100	150	
Length (mm)	135	175	205	265	135	175	205	265	
52788...	Ident. No.	005	010	020	030	105	110	120	130
		●	●	●	●	●	●	●	

Prod. Gr. 5LA

ORION® PLUS multi-stripper

Execution:

- Screwdriver with two reversible bits
- Phase and voltage tester (110-250 V)
- Cable stripper for 8-13 mm circular cables and coax cables

- Cable cutters up to 9 mm
- Two-component handle



Advantage:

- Flexible applications in a single tool
- Ergonomic handle for comfortable handling

Length (mm)	199	
52724...	Ident. No.	010
		●

Prod. Gr. 5LA

ORION® VDE slotted screwdrivers (DIN 7437)

Application:

For working on live components.

Execution:

- Protective insulation according to DIN EN 60900
- High-alloy special steel blade
- Hardened and burnished
- Individually tested

Advantage:

- Ergonomic handle for comfortable handling
- Better resistance to corrosion
- Handle and insulation in impact-resistant plastic

Technical data:

- Material of the grip handle: 1-component plastic



Width of cutting edge (mm)	2.5	3	3.5	4	5.5	6.5	8	10	
Thickness of cutting edge (mm)	0.4	0.5	0.6	0.8	1	1.2	1.2	1.6	
Blade length (mm)	75	100	100	100	125	150	175	200	
Length (mm)	155	180	180	190	225	250	285	310	
52728...	Ident. No.	530	540	550	560	580	590	600	610

Prod. Gr. 5LA

ORION® VDE slotted screwdriver set (DIN 7437)

Application:

For working on live components.

Execution:

- Protective insulation according to DIN EN 60900
- High-alloy special steel blade
- Hardened and burnished
- Certified 'GS' safety
- Individually tested

Advantage:

- Ergonomic handle for comfortable handling
- Handle and insulation in impact-resistant plastic

Delivery:

In cardboard packaging



Composition of set	Supplied blade widths: 2.5 mm/3 mm/4 mm/5.5 mm/65 mm
Number of pieces in assortment/set	7
Tip size	PH1 PH2
52728...	Ident. No. 800

Prod. Gr. 5LA

ORION® VDE Phillips PH screwdriver (DIN 7438)

Application:

For working on live components.

Execution:

- Protective insulation according to DIN EN 60900
- High-alloy special steel blade
- Hardened and burnished
- Individually tested

Advantage:

- Ergonomic handle for comfortable handling
- Handle and insulation in impact-resistant plastic

Technical data:

- Material of the grip handle: 1-component plastic



Tip size	PH0	PH1	PH2	PH3
Blade length (mm)	60	80	100	150
Length (mm)	140	170	200	260
52784...	Ident. No. 530	540	550	560

Prod. Gr. 5LA

ORION® Hexagon tubular socket spanners

Seamless, made of hardened, chrome-plated C35

Application:
Ideally suited for far-projecting threaded pins.

Technical data:

- Surface: Chrome-plated
- Material: Hardened steel



Execution:

- Impact-resistant plastic handle

Width across flats	4 mm	4.5 mm	5 mm	5.5 mm	6 mm	7 mm	8 mm	9 mm	10 mm	11 mm	12 mm	13 mm	14 mm
Length (mm)	210	210	210	210	220	220	220	220	230	230	230	230	240
Hole Ø of mount (mm)	3	3	3	3	6.3	6.3	6.3	6.3	6.3	6.3	8.5	8.5	8.5
52168...	510	520	530	540	550	560	570	580	590	600	610	620	630
Ident. No.	●	●	●	●	●	●	●	●	●	●	●	●	●

Prod. Gr. 526

ORION® Hexagon socket wrench

Execution:

- Inner bore for protruding threaded shafts

Technical data:

- Material of the grip handle: 1-component plastic
- Surface: Nickel-plated
- Material: Chrome-vanadium steel



Width across flats	7 mm	8 mm	10 mm	10 mm	13 mm
Blade length (mm)	125	125	125	200	125
Length (mm)	157	157	157	232	157
52169...	010	020	040	050	060
Ident. No.	●	●	●	●	●

Prod. Gr. 526

ORION® Hexagon tubular socket spanners

Execution:

- Made from steel pipe
- Unhardened

Technical data:

- Material: Steel pipe



Width across flats	8 mm	9 mm	10 mm	11 mm	12 mm	13 mm	14 mm	17 mm
Length (mm)	100	110	120	120	140	140	140	150
Hole Ø of mount (mm)	6	6	6	6	8	8	8	10
Surface	Chrome-plated	Chrome-plated	Chrome-plated	Chrome-plated	Chrome-plated	Chrome-plated	Chrome-plated	Chrome-plated
52174...	080	090	100	110	120	130	140	170
Ident. No.	●	●	●	●	●	●	●	●
Width across flats	19 mm	22 mm	24 mm	27 mm	30 mm	32 mm	36 mm	41 mm
Length (mm)	160	170	180	190	200	210	220	240
Hole Ø of mount (mm)	12	12	14	14	16	16	18	18
Surface	Chrome-plated	Chrome-plated	Chrome-plated	Chrome-plated	Chrome-plated	Chrome-plated	Chrome-plated	Chrome-plated
52174...	190	220	240	270	300	320	360	410
Ident. No.	●	●	●	●	●	●	●	●
Width across flats	46 mm	50 mm	55 mm	60 mm	65 mm	70 mm		
Length (mm)	245	245	245	250	250	250		
Hole Ø of mount (mm)	20	20	20	25	25	25		
Surface	Lacquered	Lacquered	Lacquered	Lacquered	Lacquered	Lacquered		
52174...	460	500	550	600	650	700		
Ident. No.	●	●	●	●	●	●		

Prod. Gr. 526

ORION® Hexagon tubular socket wrench (DIN 896)

Made of C35 steel

Execution:

- Hardened
- With tommy bar hole on both sides

Technical data:

- Surface: Chrome-plated
- Material: Hardened steel



Width across flats	6 x 7 mm	7 x 8 mm	8 x 9 mm	8 x 10 mm	9 x 10 mm	10 x 11 mm	10 x 13 mm	11 x 13 mm
Length (mm)	100	100	100	120	120	120	140	140
Hole Ø of mount (mm)	6	6	6	6	6	6	8	8
52176... Ident. No.	020	030	040	050	060	080	100	120
Width across flats	12 x 13 mm	12 x 14 mm	13 x 14 mm	13 x 15 mm	13 x 17 mm	14 x 15 mm	14 x 17 mm	16 x 17 mm
Length (mm)	140	140	140	140	150	140	150	150
Hole Ø of mount (mm)	8	8	8	8	10	8	10	10
52176... Ident. No.	140	150	155	160	170	180	190	200
Width across flats	17 x 19 mm	18 x 19 mm	19 x 22 mm	20 x 22 mm	21 x 23 mm	22 x 24 mm	24 x 26 mm	24 x 27 mm
Length (mm)	160	160	170	170	170	180	180	180
Hole Ø of mount (mm)	12	12	12	12	14	14	14	14
52176... Ident. No.	210	230	240	260	270	280	300	310
Width across flats	25 x 28 mm	27 x 30 mm	27 x 32 mm	30 x 32 mm	30 x 36 mm	32 x 36 mm	36 x 41 mm	41 x 46 mm
Length (mm)	180	200	200	220	220	220	245	245
Hole Ø of mount (mm)	16	16	16	16	18	18	18	20
52176... Ident. No.	330	350	360	370	380	390	400	410
Width across flats	46 x 50 mm							
Length (mm)	245							
Hole Ø of mount (mm)	20							
52176... Ident. No.	420							

Prod. Gr. 526

ORION® Hexagon tubular socket wrench set (DIN 896)

Execution:

- With stepped tommy bar
- Hardened
- With tommy bar hole on both sides

Delivery:

In cardboard packaging



Composition of set	lengths supplied: 100–150 mm	Supplied lengths: 100 – 170 mm	Supplied lengths: 100 – 200 mm
Width across flats	6 x 7 mm 8 x 9 mm 10 x 11 mm 12 x 13 mm 14 x 15 mm 16 x 17 mm	6 x 7 mm 8 x 9 mm 10 x 11 mm 12 x 13 mm 14 x 15 mm 16 x 17 mm 18 x 19 mm 20 x 22 mm	6 x 7 mm 8 x 9 mm 10 x 11 mm 12 x 13 mm 14 x 15 mm 16 x 17 mm 18 x 19 mm 20 x 22 mm 21 x 23 mm 24 x 26 mm 25 x 28 mm 30 x 32 mm
Hole Ø of mount (mm)	10	12	16
Surface	Chrome-plated	Chrome-plated	Chrome-plated
Material	Hardened steel	Hardened steel	Hardened steel
Number of pieces in assortment/set	6	8	12
52178... Ident. No.	100	120	200

Prod. Gr. 526

ORION® Cranked box spanner

Hollow curved version

Execution:

- With identical wrench sizes
- Can also be used with plug-in tommy bar

Advantage:

- The hollow shape allows deep screws and nuts to be tightened/loosened

Technical data:

- Surface: Chrome-plated
- Material: Chrome-vanadium steel



Width across flats	6 mm	7 mm	8 mm	9 mm	10 mm	11 mm	12 mm	13 mm
Length (mm)	105	110	115	122	130	136	145	152
Hole Ø of mount (mm)	6	6	6	6	8	8	8	8
Head Ø (mm)	10	12	13	14	15.5	16.5	18	19.5
52183...	506	507	508	509	510	511	512	513
Ident. No.	●	●	●	●	●	●	●	●
Width across flats	14 mm	15 mm	16 mm	17 mm	18 mm	19 mm	21 mm	22 mm
Length (mm)	160	170	178	187	195	205	225	230
Hole Ø of mount (mm)	10	10	12	12	12	14	14	14
Head Ø (mm)	21	22.5	24	25.5	26.5	28	32	32
52183...	514	515	516	517	518	519	521	522
Ident. No.	●	●	●	●	●	●	●	●
Width across flats	24 mm	27 mm	30 mm	32 mm				
Length (mm)	250	280	310	330				
Hole Ø of mount (mm)	18	20	20	20				
Head Ø (mm)	30.3	38	42	45				
52183...	524	527	530	532				
Ident. No.	●	●	●	●				

Prod. Gr. 526



ORION® Combination pliers**Application:**

For gripping, holding and cutting.

Execution:

- Serrated gripping surfaces
- Polished head



Length (mm)	180
Surface	Bare
VDE certified	No
Material of the grip handle	Polyvinyl chloride
Max. medium wire Ø cutting capacity (mm)	2
53233...	180
Ident. No.	●

Prod. Gr. 593

ORION® Snipe-nose pliers**Application:**

Suitable for more delicate gripping and cutting tasks.

Execution:

- Flat, round jaws, pointed, straight shape
- Serrated gripping surface
- With blade



Length (mm)	200
Surface	Bare
VDE certified	No
Material of the grip handle	Polyvinyl chloride
Version	
53095...	200
Straight	Ident. No. ●

Prod. Gr. 593

ORION® Water pump pliers (ISO 8976)
with box joint**Execution:**

- Chrome-vanadium steel
- Painted red
- Serrated gripping surfaces

Technical data:

- Surface: Bare
- Material of the grip handle: Steel



Length (mm)	250	300
Max. clamping width (mm)	40	50
53418...	250	300
Ident. No.	●	●

Prod. Gr. 593

ORION® Side cutters

Technical data:

- Surface: Bare
- VDE certified: No
- Material of the grip handle: Polyvinyl chloride

Length (mm)		140	160
53251...	Ident. No.	140	160

Prod. Gr. 593



ORION® Cable knives Fixed blade

Length (mm)		190
Material of the grip handle		Wood
53610...	Ident. No.	010

Prod. Gr. 598



ORION® Cable knives

Application:

Ident. No. 005: For cutting cables.

Ident. No. 010: For cutting and stripping cables.

Execution:

- Foldable

▪ **Ident. No. 010:** Blade with double scraper

Length (mm)		191	185
Material of the grip handle		Wood	Plastic
53615...	Ident. No.	005	010

Prod. Gr. 598



Ident. No. 005



Ident. No. 010

ORION® Cable knives With blade and awl

Application:

For cutting cables and poking holes.

Execution:

- Two-piece

Length (mm)		170
Material of the grip handle		Wood
53617...	Ident. No.	010

Prod. Gr. 598



ORION® Cable knives 4-piece

Application:

For cutting and stripping cables and poking holes.

- Screwdriver

- Awl

- With brass inlay

Execution:

- Large and small blade

Length (mm)		170
Material of the grip handle		Plastic
53619...	Ident. No.	010

Prod. Gr. 598



ORION® Cable knives

Application:

Ident. No. 010-026: For stripping sheathing from all common types of round cables, including waterproof cables.

Execution:

- **Ident. No. 010-026:** Cutting depth is adjusted using the adjusting screw on the end of the handle
- **Ident. No. 022:** For ribbon cables and flat cables

- **Ident. No. 026:** Optimum safety through retractable hooked blade

- **Ident. No. 028:** For fine strand and solid conductors with PVC insulation. Also with stripping station in housing for 0.5-6 mm²

Advantage:

- **Ident. No. 010-026:** The rotating inner blade automatically adjusts to the long cut after the round cut



Version	No pre-cutter	No pre-cutter	Hook blade	Straight blade	Hook blade	With spring
Length (mm)	140	140	185	185	145	145
Min./max. cable Ø	4-16 mm	8-28 mm	4-28 mm	4-28 mm	4-28 mm	4-28 mm
Material of the grip handle	2-component plastic	2-component plastic	2-component plastic	2-component plastic	1-component plastic	1-component plastic
53631...	Ident. No. 010	020	022	024	026	028

Prod. Gr. 598

ORION® Coax, round cable stripping tool and data cable stripper

Application:

Ident. No. 050: Stripping of all common coaxial cables in just 2 steps.

Ident. No. 060: For round and wet room cabling, facilitates flush stripping including in hard-to-reach places.

Ident. No. 070: For stripping data lines and stranded wires.

Ident. No. 080: removes coating from round cables, strips insulation and cuts them

- **Ident. No. 060:** Adjustment of cutting depth not necessary. Length 120 mm. For cables from 8-13 mm

- **Ident. No. 070:** Adjustable inner blade and side cutter. For cables from 4-10 mm and stranded wires from 0.2-0.8 mm

- **Ident. No. 080:**
 - round cut, longitudinal cut, stripping, cutting – all with one tool
 - hooked blade can be locked in any position
 - multi-functional with optimised cable routing

Execution:

- **Ident. No. 050:** Adjustment of cutting depth not necessary. Length 110 mm. For cables from 4.8-7.5 mm



Min./max. stripper size	-	-	-	6-0.5 mm ²
Min./max. cable Ø	4.8-7.5 mm	8-13 mm	4-10 mm	8-13 mm
Material of the grip handle	1-component plastic	1-component plastic	2-component plastic	1-component plastic
53592...	Ident. No. 050	060	070	080

Prod. Gr. 598

ORION® Automatic wire stripping pliers Self-adjusting

Application:

For automatic stripping of fine-strand and solid conductors with PVC insulation.

Execution:

- Interchangeable high-quality, hardened steel inserts
- Fully insulated, robust design made from fibre glass-reinforced polyamide
- With ergonomic handles and additional locking option

- Length stop adjustable from 5-12 mm
- ref. no. 510 : For unsheathing and stripping
- Side-cutters up to maximum 3 mm in diameter

Advantage:

- Also suitable for use in hard-to-reach areas thanks to the narrow jaws
- The external insulation is not damaged thanks to a special gauging system



Ident. No. 500



Ident. No. 510

Length (mm)		170	170
Min./max. stripper size		0.2-6 mm ²	0.5-16 mm ²
Material of the grip handle		1-component plastic	1-component plastic
53580...	Ident. No.	500	510

Prod. Gr. 598

ORION® Machinist's hammers (DIN 1041) German type

Execution:

- DIN 1041 hammer head, C45 steel, electric-inductively hardened
- Polished impact surfaces
- Ergonomically shaped ash handle, waterproofed, painted
- With safety ring wedge

Technical data:

- Material of the handle: Ash
- Handle fastening: Splined



Weight of head (kg)		0.1	0.2	0.3	0.4	0.5	0.6	0.8	1	1.5	2
Length (mm)		260	280	300	310	320	330	350	360	380	400
51180...	Ident. No.	500	510	520	530	540	550	560	570	580	590

Prod. Gr. 593

ORION® Roofer's hammer (DIN 7239) Southern German shape

Execution:

- Rubber handle
- Handle lock
- Nail holder and roughened face

Advantage:

- With extremely strong magnet



Weight (kg)	0.95
Weight of head (kg)	0.6
Length (mm)	300
Material of the handle	Steel
51190...	Ident. No. 010

Prod. Gr. 593

ORION® Sledgehammers German type

Execution:

- C45 steel, inductively hardened
- Painted black, polished work surfaces

Technical data:

- Handle fastening: Splined
- Material of the handle: Ash



Weight of head (kg)		1	1.25	1.5	2
Length (mm)		260	280	280	300
Weight (kg)		1.19	1.41	1.725	2.24
51196...	Ident. No.	010	020	030	040

Prod. Gr. 593

ORION® Soft-face hammers

Recoil-free with hickory handle

Application:
Ideally suited for straightening workpieces on machine tables.

▪ The metal shot in the hammer head doubles the impact effect compared to standard hammers

Execution:
▪ Polyurethane heads, shatterproof, blue, medium-hard

Technical data:
▪ Recoil-free: Yes
▪ Material of the handle: Hickory
▪ Impact insert, interchangeable: Yes
▪ Handle fastening: Pinned
▪ Protective handle sleeve available: No

Advantage:
▪ Gentle on arms and muscles as the recoil is reduced

Head Ø (mm)		30	40	50
Length of head (mm)		115	125	135
Length (mm)		350	375	385
Weight (kg)		0.45	0.75	1.25
51215...	Ident. No.	510	520	530
		●	●	●



Prod. Gr. 593

Accessories for			51215 510	51215 520	51215 530
51217...	Spare inserts	Ident. No.	510	520	530
			●	●	●
51221...	Hickory spare handle	Ident. No.	430	440	440
			●	●	●

ORION® Wooden mallets

Hornbeam

Execution:
▪ Hornbeam head, with metal covering, smooth finish

Technical data:
▪ Material of the handle: Ash
▪ Handle fastening: Splined

Head Ø (mm)		50	60	70	80
Length of head (mm)		100	120	140	160
Length (mm)		280	300	320	350
Weight (kg)		0.2	0.3	0.55	0.85
51243...	Ident. No.	050	060	070	080
		●	●	●	●



Prod. Gr. 593

ORION® Flat chisels

Execution:
▪ Tempered impact head
▪ Painted shaft

Technical data:
▪ Material: Chrome-vanadium steel

Length (mm)		125	150	175	200	250	300
Width of cutting edge (mm)		15	18	21	24	25	26
Shank width x shank thickness		14 x 9 mm	17 x 11 mm	20 x 12 mm	23 x 13 mm	23 x 13 mm	23 x 13 mm
51256...	Ident. No.	510	520	530	540	550	560
		●	●	●	●	●	●



Prod. Gr. 593

ORION® Cross-cut chisel

Execution:
▪ Tempered impact head
▪ Painted shaft

Technical data:
▪ Material: Chrome-vanadium steel

Length (mm)		125	150	175	200	250
Width of cutting edge (mm)		5	6	7	8	9
Shank width x shank thickness		14 x 9 mm	17 x 11 mm	17 x 11 mm	20 x 12 mm	23 x 13 mm
51258...	Ident. No.	510	520	530	540	550
		●	●	●	●	●



Prod. Gr. 593

ORION® Grooving chisels

Execution:

- Tempered impact head
- Painted shaft

Length (mm)		150	150	150
Width of cutting edge (mm)		2	3	4
Shank width x shank thickness		12 x 12 mm	12 x 12 mm	12 x 12 mm
Material		Chrome-vanadium steel	Chrome-vanadium steel	Chrome-vanadium steel
51263...	Ident. No.	500	510	520

Prod. Gr. 593



ORION® Mason's chisels

Execution:

- Tempered impact head
- Painted shaft

Technical data:

- Material: Chrome-vanadium steel

Length (mm)		200	300	400	500
Width of cutting edge (mm)		24	26	26	30
Shank width x shank thickness		16 x 16 mm	18 x 18 mm	18 x 18 mm	20 x 20 mm
51264...	Ident. No.	500	520	530	540

Prod. Gr. 593



ORION® Slitting or bodywork chisels

Execution:

- Tempered impact head
- Flat-oval shaft, painted

Length (mm)		240
Width of cutting edge (mm)		26
Shank width x shank thickness		26 x 7 mm
Material		Chrome-vanadium steel
51266...	Ident. No.	500

Prod. Gr. 593



ORION® Parting chisel

Execution:

- Tempered impact head
- Painted shaft

Length (mm)		125	125
Width of cutting edge (mm)		10	12
Shank width x shank thickness		10 x 10 mm	12 x 12 mm
Material		Chrome-vanadium steel	Chrome-vanadium steel
51267...	Ident. No.	500	510

Prod. Gr. 593



ORION® Electrician's chisel

Execution:

- Tempered impact head
- Painted shaft

Technical data:

- Material: Chrome-vanadium steel

Length (mm)		200	250	250	250
Width of cutting edge (mm)		10	10	12	14
Shank width x shank thickness		8 x 8 mm	8 x 8 mm	10 x 10 mm	12 x 12 mm
51268...	Ident. No.	500	530	540	550

Prod. Gr. 593



Pin punches (DIN 6450)

Application:
For driving split pins and studs out of clearance holes.

- Drive cone or drive point, bare
- Painted shaft



No. 51280

Execution:
▪ Tempered impact head

- Technical data:**
- Length: 150 mm
 - Material: Chrome-vanadium steel



No. 51283

Tip Ø (mm)		2	3	4	5	6	7	8
Shank width x shank thickness		10 x 10 mm	10 x 10 mm	10 x 10 mm	10 x 10 mm	10 x 10 mm	12 x 12 mm	12 x 12 mm
GEDORE 51280...	Ident. No.	220	230	240	250	260	270	280
ORION 51283...	Ident. No.	500	520	540	560	570	580	590

Tip Ø (mm)		10	2.5	3.5	4.5	12
Shank width x shank thickness		12 x 12 mm	10 x 10 mm	10 x 10 mm	10 x 10 mm	12 x 12 mm
GEDORE 51280...	Ident. No.	310	-	-	-	-
ORION 51283...	Ident. No.	595	510	530	550	597

GEDORE = Prod. Gr. 558
ORION = Prod. Gr. 593

Pin punch sets

Application:
For driving split pins and studs out of clearance holes.

- Drive cone or drive point, bare
- Painted shaft
- Tip diameter: 3/4/5/6/7/8 mm

Execution:
▪ Chrome-vanadium steel, tempered
▪ Tempered impact head

- Technical data:**
▪ Length: 150 mm



No. 51280



No. 51284 500



No. 51284 520

	GEDORE		ORION	
	In metal case	In holder with base	In metal case	In metal case
Composition of set	51280...	51284...	51284...	51284...
Ident. No.	●	-	-	-
Supplied shaft cross-sections: 6 x 6 mm/8 x 2 mm	395	-	-	-
Supplied shaft cross-sections: 10-12 mm	-	500	●	520
				●

GEDORE = Prod. Gr. 558
ORION = Prod. Gr. 593

ORION® Scriber with straight and bent tip

Execution:
▪ CrV steel, hardened
▪ One-piece construction

- With straight and bent tip
- Knurled handle



Length (mm)	160
Shaft Ø (mm)	5
51315...	Ident. No. 500
	●

Prod. Gr. 523

ORION® Metal saw bow

Execution:

- Solid steel bracket

- Wing clamping nut
- Wooden handle



Suitable for sawblade length (mm)	300
51845...	Ident. No. 500

Prod. Gr. 529

ORION® Metal saw bow

Execution:

- Bow made from rectangular pipe
- Handle silver powder-coated, pipe chrome-plated.
- With wing clamping nut.

Advantage:

- Blade can be adjusted by 90°



Suitable for sawblade length (mm)	300
Tension force (N)	100
51846...	Ident. No. 500



MORE THAN 60,000 PRODUCTS FOR MAXIMUM INNOVATION.

WE HAVE WHAT IT TAKES.

For a complete range of products that meet the toughest demands, visit www.iconridge.com

ORION® Utility knife with trapezoidal blades

Execution:

- Die-cast housing
- **Ident. No. 500:**
 - With retractable blade
 - Mechanically adjustable blade

▪ **Ident. No. 700:**

- Ergonomic handle with soft component
- Blades are changed without needing to screw them on

Technical data:

- Width of knife blade: 18.7 mm

Advantage:

- **Ident. No. 600-700:** Safe working processes thanks to automatic blade retraction



Ident. No. 500



Ident. No. 600



Ident. No. 700

Length (mm)		150	160	162
53642...	Ident. No.	500	600	700

Prod. Gr. 598

Accessories for			53642 500	53642 600	53642 700
53642...	Trapezoidal blades, pack of 10	Ident. No.	610	610	610

ORION® Knives with snap-off blades

Execution:

- With mechanical blade catch
- **Ident. No. 100-110:**
 - Die-cast zinc housing
 - Stainless steel blade guide

- **Ident. No. 100-110, 510:** Includes 2 spare blades in housing

- **Ident. No. 500-510:** Plastic housing

Advantage:

- **Ident. No. 100:** With protective cap on tip
- **Ident. No. 110:** Ergonomic design with rubber handle



Ident. No. 100



Ident. No. 110



Ident. No. 500



Ident. No. 510

Length (mm)		145	165	140	160
Width of knife blade (mm)		9	18	9	18
53643...	Ident. No.	100	110	500	510

Prod. Gr. 598

Accessories for			53643 100	53643 110	53643 500	53643 510
53643...	Spare blades, pack of 10 Snap-off	Ident. No.	600	610	600	610

ORION® Scraper set 4-piece

Execution:

- Stainless steel blades
- Can be ground
- Blade widths: 20/32 mm
- Blade length: 55/105 mm

Advantage:

- Non-slip plastic grip fits perfectly in your hand
- With stainless steel cap – indestructible

Material of the grip handle		Plastic
53704...	Ident. No.	500

Prod. Gr. 598



ORION® TOP all-purpose shears**Application:**

For cutting sheet metal, soft wire, iron bands, fabric, cardboard, plastic, paper, leather, flowers, branches, carpets, twine etc.

Execution:

- Especially robust
- Rustproof stainless steel head
- Screw joint prevented from coming loose

Length (mm)	180
Version	Straight
53723...	Ident. No. 010

Prod. Gr. 598

Advantage:

- Serrated cutting edges, making them particularly non-slip
- With safety lock
- With ergonomic handles for safe and fatigue-free work

**ORION® TOP all-purpose and electrician's shears****Application:**

For cutting cables, insulating material, cable ducts, leather, cardboard etc.

Execution:

- Stainless steel head
- Screw joint prevented from coming loose

Length (mm)	140
53724...	Ident. No. 010

Prod. Gr. 598

Advantage:

- One blade has fine teeth, one is smooth, thereby ensuring precise working on cables
- Durable, robust two-component handle, non-slip and ergonomic

**ORION® Revolving punch lever pliers****Application:**

for perforating leather, textiles and plastic materials

Execution:

- patented lever system means an effortless punching force of up to 4000 N
- hardened, precisely-sharpened hole punches

53820...	Ident. No. 600
----------	----------------

Prod. Gr. 580

- Hole diameters: 2, 2.5, 3, 3.5, 4 and 4.5 mm
- hole viewing window on back of pliers
- rotation direction arrows on both sides
- ergonomically shaped plastic handles

Technical data:

- Length: 250 mm

**ORION® Hand rivet tool****Application:**

For blind rivets made from aluminium alloy, copper, steel and stainless steel.

Execution:

- Hand riveting pliers with transmission

Length (mm)	270
Suitable for max. rivet Ø (rivet material: aluminium) (mm)	4
Suitable for max. rivet Ø (rivet material: stainless steel) (mm)	4
53197...	Ident. No. 020

Prod. Gr. 593

- Ergonomically shaped handles

Delivery:

With 4 nosepieces



CHOOSE FROM OVER
70,000 PRODUCTS.

WE HAVE WHAT IT TAKES.

For a complete range of products that meet the toughest demands, visit www.iconridge.com

ORION® All-steel welder's hammer**Application:**

For removing slag from welding seams.

Length (mm)	300
Material of the handle	Steel
51192...	Ident. No. 010
	●

Prod. Gr. 593

Execution:

- Welded-on tubular handle
- Ground
- Painted green



ORION® Telescopic inspection mirrors

Application:

For inspecting partly concealed areas.

Execution:

- **Ident. No. 270:**
 - Chrome-plated metal handle
 - With attachment clip

- **Ident. No. 270–280:** Round mirror
- **Ident. No. 280–290:** Plastic-coated metal handle
- **Ident. No. 290:** Rectangular mirror, mirror dimensions 43 x 65 mm



Ident. No. 270



Ident. No. 280



Ident. No. 290

Ø of mirror (mm)	30	50	43
Max. extension length (mm)	520	730	720
52995...	Ident. No. 270	280	290
	●	●	●

Prod. Gr. 598

ORION® Inspection set Modular system

Application:

For all inspection tasks.

Execution:

- In case with impact-resistant foam inlay

Ø of mirror (mm)	60
Width of mirror (mm)	43
Mirror height (mm)	65
Max. extension length (mm)	600
52995...	Ident. No. 500
	●

Prod. Gr. 598

Delivery:

2 mirrors (round 60 mm, rectangular 65 x 43 mm), telescopic handle, LED inspection lamp, magnetic attachment, batteries



ARE YOU LOOKING FOR PRODUCTS THAT MEET THE TOUGHEST DEMANDS?

WE HAVE WHAT IT TAKES.

For a complete range of products that meet the toughest demands, visit www.iconridge.com

ORION® Flat magnetic grips Without threaded pin

Application:

Auxiliary materials with universal application during clamping, assembling, lifting and welding operations, and for installing in devices etc.

- Magnetic shielding
- Without threaded pin
- Operating temperature up to 100°C

Execution:

- With hard ferrite core
- Surface galvanised

Technical data:

- Outer diameter: 80 mm
- Height: 18 mm
- Adherence strength: 550 N



51143...

Ident. No. 590

Prod. Gr. 591

ORION® Flat magnetic grips With threaded bush

Application:

Auxiliary materials with universal application during clamping, assembling, lifting and welding operations, and for installing in devices etc.

Execution:

- With hard ferrite core
- Surface galvanised
- Magnetic shielding
- With threaded bush
- Operating temperature up to 100°C



Outer Ø (mm)	10	13	16	20	25	32	40	50	63	80	100	
Height (mm)	11.5	11.5	11.5	13	15	15	18	22	30	34	42	
Height of the base (mm)	4.5	4.5	4.5	6	7	7	8	10	14	18	22	
Adherence strength (N)	5	12	30	40	49	90	130	220	300	550	900	
Thread dimension	M3	M3	M3	M3	M4	M4	M5	M6	M8	M10	M12	
Thread length (mm)	7	7	7	7	8	8	10	12	16	16	20	
51145...	Ident. No.	500	510	520	530	540	550	560	570	580	590	600

Prod. Gr. 591

ORION® Flat magnetic grips With bore hole and countersink

Application:

Auxiliary materials with universal application during clamping, assembling, lifting and welding operations, and for installing in devices etc.

- Surface galvanised
- Magnetic shielding
- With bore hole and countersink
- Operating temperature up to 100°C

Execution:

- With hard ferrite core

Advantage:

- Fastening option from inside with a screw



Outer Ø (mm)	16	20	25	32	40	50	63	80	
Height (mm)	4.5	6	7	7	8	10.5	14	18	
Bore Ø (mm)	3.5	4.2	5.5	5.5	5.5	6.5	6.5	6.5	
Adherence strength (N)	30	40	49	90	130	180	290	540	
51146...	Ident. No.	720	730	740	750	760	770	780	790

Prod. Gr. 591

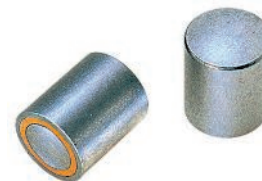
ORION® Magnetic bar grips Round, with an AlNiCo core

Application:

Auxiliary materials with universal application during clamping, assembling, lifting and welding operations, and for installing in devices etc.

Execution:

- With AlNiCo core
- Magnet encased in steel
- Operating temperature up to 450°C
- Fastening option: Press in, shrink or glue in place
- Smooth exterior surface with h6 fit tolerance



Outer Ø (mm)	6	8	10	13	16	20	25	32	40	50	
Height (mm)	10	12	16	18	20	25	30	35	45	50	
Adherence strength (N)	6	10	14	27	36	72	90	100	130	200	
51148...	Ident. No.	500	510	520	530	540	550	560	570	580	590

Prod. Gr. 591

ORION® Magnetic bar grips

Round, with an AlNiCo core

Application:

Auxiliary materials with universal application during clamping, assembling, lifting and welding operations, and for installing in devices etc.

Execution:

- With AlNiCo core
- Magnet encased in steel
- Operating temperature up to 450°C
- With female thread
- Fastening option: Screws



Outer Ø (mm)	6	7	10	13	16	20	25	32	
Height (mm)	20	20	20	20	20	25	35	40	
Adherence strength (N)	1.7	4	8.5	12	20	50	115	200	
Thread dimension	M3	M3	M4	M4	M4	M6	M6	M8	
Thread length (mm)	5	5	7	7	5	7	9	9	
51150...	Ident. No.	800	810	820	830	840	850	860	870

Prod. Gr. 591

ORION® Magnetic grips

Application:

Auxiliary materials with universal application during clamping, assembling, lifting and welding operations, and for installing in devices etc.

Advantage:

- Smooth, with h6 fit tolerance
- **Ident. No. 500–560:** With neodymium core for approx. 5x adhesive force compared to conventional flat grips
- **Ident. No. 700–760:** With samarium cobalt core for approx. 5x adhesive force compared to conventional flat grips



Execution:

- Magnet encased in brass
- Fastening option: Press in, shrink or glue in place

Outer Ø (mm)	6	8	10	13	16	20	25		
Height (mm)	20	20	20	20	20	25	35		
Adherence strength (N)	7	12	45	70	150	300	500		
51149...	Operating temperature up to 100°C	Ident. No.	500	510	520	530	540	550	560
51149...	Operating temperature up to 200°C	Ident. No.	700	710	720	730	740	750	760

Prod. Gr. 591

ORION® Magnetic lifter

Application:

For lifting and picking up small magnetic objects.

Execution:

- With flexible shaft

- Chrome-plated
- Plastic handle
- **Ident. No. 500–530:** With fixed neodymium core magnetic head
- **Ident. No. 600–620:** With detachable AlNiCo magnetic head



Ident. No. 500–530



Ident. No. 600



Ident. No. 610



Ident. No. 620

Length (mm)	380	380	420	420	600	600	600	
Head Ø (mm)	8	12	14	19	11	20	30	
51155...	Ident. No.	500	510	520	530	600	610	620

Prod. Gr. 591

ORION® Hand-held bar magnets 700 mm long

Application:
For effortlessly removing screws, tools and other small parts from gearbox enclosures or other difficult-to-reach areas.

- With oil-resistant protective sleeve
- Plastic handle

Execution:
▪ With flexible handle

Technical data:
▪ Length: 700 mm



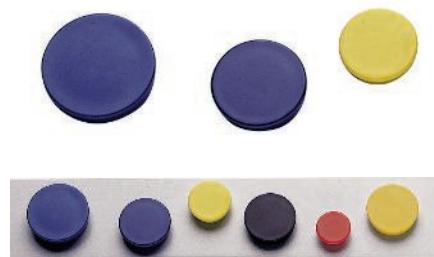
Head Ø (mm)	11	20	30
51156...	010	020	040
Ident. No.	•	•	•

Prod. Gr. 591

ORION® Organising magnets

Application:
For fixing drawings and other paper documents to magnetic surfaces.

Execution:
▪ Magnetic clamp with coloured plastic cap



Outer Ø (mm)	Blue		Yellow		Red		Black		White	
	51161... Ident. No.	•	51161... Ident. No.	•	51161... Ident. No.	•	51161... Ident. No.	•	51161... Ident. No.	•
20	010	•	020	•	030	•	040	•	050	•
25	060	•	070	•	080	•	090	•	100	•
30	110	•	120	•	130	•	140	•	150	•
34	155	•	160	•	170	•	180	•	190	•

Prod. Gr. 591

ORION® Decorative magnets

Application:
For attaching a variety of objects to magnetic surfaces.

Execution:
▪ Adhesive magnet with hook
▪ Painted white



Outer Ø (mm)	20	25	32	40
51161...	200	210	220	230
Colour	White	White	White	White
Ident. No.	•	•	•	•

Prod. Gr. 591

ORION® Wall straps

Application:
Used as a base under magnetic clamps.

Execution:
▪ White
▪ Self-adhesive

Width of band (mm)	50	50	35
Length of tape (m)	0.5	1	5
Colour	White	White	White
51161...	300	310	320
Ident. No.	•	•	•

Prod. Gr. 591

ORION® Magnetic tapes

Application:

For labelling with water-soluble permanent fibre tip pen, applications e.g. shelves, cabinets, organisational boards etc.

Technical data:

- Length of tape: 10 m



Colour	Blue	Yellow	Red	White
Width of band (mm)	51162... Ident. No.	51162... Ident. No.	51162... Ident. No.	51162... Ident. No.
20	010 ●	020 ●	030 ●	040 ●
30	110 ●	120 ●	130 ●	140 ●

Prod. Gr. 591

ORION® Pistol-type atomiser

Application:

For finely atomising liquids.

Execution:

- Plastic container, white, slightly transparent
- Adjustable nozzle – spray mist or jet
- **No. 56056:** With Viton seal



No. 56058



No. 56056

	Volumetric capacity	Colour	Ident. No.
56056...	0.6 l	Transparent	500 ●
56058...	0.5 l	Transparent	500 ●
56058...	1 l	Transparent	510 ●

Prod. Gr. 598

ORION® High-pressure sprayer

Application:

For atomising liquids.

- Adjustable nozzle – spray mist or jet
- Not suitable for oil and solvents

Execution:

- Plastic container, white, slightly transparent

Advantage:

- With locking lever for continuous spray



Volumetric capacity	Working pressure (bar)	Ident. No.
	2 l	
	3	
56061...		520 ●

Prod. Gr. 598

ORION® Push-type grease presses With follow-up piston

Application:

For greases of medium consistency and high-viscosity oils.

- **No. 56191:** With pointed nosepiece for flush-type lubrication nipples DIN 3405
- **No. 56192:** With universal adapter for spherical and conical lubricating nipple DIN 71412

Execution:

- Made from steel, burnished

Technical data:

- Feed volume per stroke: 0.6 cm³



Volumetric capacity	Length (mm)	60 ml	0.15 l
		115	185
56191...	Mouthpiece outlet		
	Extrusion die	Ident. No. 500 ●	Ident. No. 510 ●
56192...	Universal die	Ident. No. 500 ●	Ident. No. 510 ●

Prod. Gr. 598

ORION® Oil presses For all oils

Application:
For all oils.

- Execution:**
- **Ident. No. 500:** With pointed nosepiece for flush-type lubrication nipples DIN 3405
 - **Ident. No. 510:** With universal adapter for spherical and conical lubricating nipple DIN 71412



Volumetric capacity		180 ml
Feed volume per stroke (cm ³)		0.8
Length (mm)		133
56195...	Mouthpiece outlet	Ident. No. 500
	Extrusion die	
56195...	Hollow hydraulic die	Ident. No. 510

Prod. Gr. 598

ORION® Lever-operated cylinder-type drum pump

Application:
For pumping petroleum, diesel, heating oil, engine oil, machine oil, cutting oil, Multitin, anti-freeze. NOT suitable for petrol

- Barrel screw connection G 2" a and M 64x4 a
- 1-m outlet hose with hose clamps, steel outlet manifold and anti-kink spring



Execution:

- With galvanised telescopic tube G1/2-inch

Advantage:

- Suction pipe can be adjusted to set the immersion depth

Min./max. immersion depth	480-930 mm
Feed quantity (l/min)	35
Suitable for container	60-210 litres
56318... Ident. No.	500

Prod. Gr. 575

ORION® Easy-opener and multi-opener

Application:
the ideal tool for gently opening sensitive components

- **Ident. No. 110:**
 - slim design – flexible and strong at the same time, made of glass-fibre reinforced polyamide
 - conductive ESD material protects against electrostatic discharge
 - does not scratch delicate surfaces
 - steel insert on the handle side e.g. for prying open paint cans

Execution:

- **Ident. No. 100:**
 - delicate, slim design – flexible and strong at the same time
 - three lever surfaces with different material thicknesses
 - ideal for loosening e.g. switches, lights or similar elements



Ident. No. 100



Ident. No. 110



Length (mm)		178	180
	Width (mm)	Material of the grip handle	
56549...	32	Polyamide	Ident. No. 100
56549...	32	Plastic glass fibre reinforced	Ident. No. 110

Prod. Gr. 598

ORION® Set of prying tools 4-piece

Application:
For all kinds of leverage tasks.

Execution:

- Angled blades
- Lever bar lengths: 200, 300, 450, 600 mm

Advantage:

- Non-slip plastic grip fits perfectly in your hand
- With impact-resistant grip – indestructible and robust in application



Material of the grip handle	Plastic
55617... Ident. No.	010

Prod. Gr. 598

ORION® Spark plug brushes

Material of the wire	Brass	Brass
Number of rows (PCS)	3	4
Length (mm)	150	200
Length of bristles (mm)	15	18
Wire Ø (mm)	0.15	0.15
56710... Ident. No.	500	510

Prod. Gr. 598



ORION® File brush File brush band, bonded

Execution:

- File brush band, stuck on
- Brush strip size: 115 x 40 mm

Length (mm)	250
56720... Ident. No.	500

Prod. Gr. 598



ORION® Wire hand brushes Steel, stainless steel and brass wire

Application:
For cleaning cast iron pieces, files and for brushing a wide array of parts and surfaces.

Technical data:

- Length of bristles: 25 mm
- Wire diameter: 0.3 mm
- Length: 290 mm



Number of rows (PCS)		1	2	3	4	5	6
Width (mm)		15	22	30	35	40	45
56725...	Steel	Ident. No. 510	520	530	540	550	560
56726...	Stainless steel	Ident. No. 510	520	530	540	550	560
56727...	Brass	Ident. No. -	520	530	540	550	-

Prod. Gr. 598

ORION® Fillet weld brush

Application:
For cleaning fillet welds after welding processes.

- Technical data:**
- Number of rows: 3 PCS
 - Length: 290 mm
 - Length of bristles: 35 mm
 - Width: 35 mm



Material of the wire	Steel	Stainless steel
56730...	Ident. No. 510	520

Prod. Gr. 598

ORION® Cleaning brushes

Application:
For cleaning uneven surfaces.

- Technical data:**
- Length: 225 mm

Material of the bristles	Nylon	Horsehair
Number of rows (PCS)	4	3
56735...	Ident. No. 510	500

Prod. Gr. 598



Ident. No. 500



Ident. No. 510

ORION® Universal hand brushes

Application:
For cleaning cast iron pieces, files and for brushing a wide array of parts and surfaces.

Execution:

- With ergonomic plastic handle

- Technical data:**
- Number of rows: 1 PCS
 - Length of bristles: 28 mm
 - Wire diameter: 0.3 mm
 - Width: 15 mm
 - Length: 260 mm



	Material of the wire	Ident. No.
56740...	Steel	500
56740...	Stainless steel	510

Prod. Gr. 598

ORION® Dustpans

Execution:

- **Ident. No. 500:**
 - With wooden handle
 - No lip
 - Painted black
 - Dustpan size: 220 x 200 mm

- **Ident. No. 510:**
 - Metal dustpan and handle
 - With rubber lip



Ident. No. 500



Ident. No. 510

Material	Sheet steel	Sheet steel
Material of the grip handle	Wood	Metal
56750...	Ident. No. 500	510

Prod. Gr. 598

ORION® Wooden hand brush



Ident. No. 610



Ident. No. 620

Material of the bristles		Coconut	Coconut	Horsehair	Horsehair	Arenga
Length (mm)		280	430	280	430	430
56737...	Ident. No.	520	620	510	610	630
		●	●	●	●	●

Prod. Gr. 598

ORION® Factory and workshop broom

Application:

Ident. No. 010-020, 050-060: For dry floors

Ident. No. 030-040: For concrete, industrial and wooden floors

Ident. No. 070-080: For rough indoor and outdoor floors

Execution:

▪ **Ident. No. 030-040:** Resistant to oil and alkalis

▪ **Ident. No. 070-080:** Wet- and oil-resistant fibres

Delivery:

With handle holder, without handle; please order separately



Ident. No. 010-020



Ident. No. 030-040



Ident. No. 050-060



Ident. No. 070

Width (mm)			400	600
	Material of the bristles			
56760...	Coconut	Ident. No.	010	020
			●	●
56760...	Elaston	Ident. No.	030	040
			●	●
56760...	Artificial fibre bristle	Ident. No.	050	060
			●	●
56760...	Arenga	Ident. No.	070	080
			●	●

Prod. Gr. 598

Accessories for			56760 010	56760 020	56760 030	56760 040	56760 050	56760 060	56760 070
56760...	1400-mm broom	Ident. No.	110	-	110	-	110	-	110
	handle		●		●		●		●
56760...	1500-mm broom	Ident. No.	-	120	-	120	-	120	-
	handle			●		●		●	

Accessories for			56760 080
56760...	1400-mm broom	Ident. No.	-
	handle		
56760...	1500-mm broom	Ident. No.	120
	handle		●



THE HIGHEST QUALITY PRODUCTS
FOR MAXIMUM EFFICIENCY.

WE HAVE WHAT IT TAKES.



For a complete range of products that meet the toughest demands, visit www.iconridge.com

ORION® Set of digit and letter stamps
For manual use without depth limitation

Application:
For labelling parts.

- Close-spaced lettering
- Hardness at end of writing: 58-60 HRC
- Maximum strength: 1200 N/mm²
- Nickel-plated

- Execution:**
- Standard lettering
 - Left-engraved
 - DIN 1451 typeface

Delivery:
In plastic box



Character height (mm)				2	3	4	5	6	8	10
Length x width x height				7 x 7 x 75 mm	8 x 8 x 75 mm	9 x 9 x 80 mm	10 x 10 x 80 mm	12 x 12 x 85 mm	14 x 14 x 90 mm	16 x 16 x 90 mm
Surface				Nickel-plated	Nickel-plated	Nickel-plated	Nickel-plated	Nickel-plated	Nickel-plated	Nickel-plated
With depth limiter				No	No	No	No	No	No	No
	Character type provided	Number of stamps (PCS)								
56925...	Numbers	9	Ident. No.	720	730	740	750	760	780	800
56926...	Letters	27	Ident. No.	720	730	740	750	760	780	800

Prod. Gr. 577

ORION® Set of figure and letter stamps
For manual use with depth limitation

Application:
For labelling parts

- DIN 1451 typeface
- Close-spaced lettering
- Hardness at end of writing: 58-60 HRC
- Maximum strength: 1200 N/mm²
- Nickel-plated

- Execution:**
- With depth limit
 - Standard lettering
 - Exactly in the centre

Delivery:
In plastic box



Character height (mm)				1	1.5	2	2.5	3	4	5	6	8	10
Length x width x height				7 x 7 x 75 mm	7 x 7 x 75 mm	7 x 7 x 75 mm	7 x 7 x 75 mm	8 x 8 x 75 mm	8 x 8 x 75 mm	9 x 9 x 80 mm	11 x 11 x 80 mm	12 x 12 x 85 mm	14 x 14 x 90 mm
Surface				Nickel-plated	Nickel-plated	Nickel-plated	Nickel-plated	Nickel-plated	Nickel-plated	Nickel-plated	Nickel-plated	Nickel-plated	Nickel-plated
With depth limiter				Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Character type provided	Number of stamps (PCS)											
56930...	Numbers	9	Ident. No.	010	015	020	025	030	040	050	060	080	100
56932...	Letters	27	Ident. No.	010	015	020	025	030	040	050	060	080	100

Prod. Gr. 577



ORION® ORION synthetic leather tool bag

Synthetic leather

Execution:

- With zip
- With rubber retaining straps
- Without contents
- Size when open: length x width 500 x 275 mm, when closed 240 x 275 x 35 mm

55400... | Ident. No. 010

Prod. Gr. 598

Delivery:

contains no tools

Technical data:

- Material: Faux leather



Contents not included

ORION® Tool cases

Execution:

- In highly impact-resistant ABS plastic
- Robust aluminium frame with edge protection against impact
- 2 lockable anti-tilt locks and combination lock
- Adjustable carry belt
- Hinge cover and safety lid support
- Removable tool panel with 21 pockets
- Cover plate with 3 pockets and module plug-in system
- Variably dividable base tray
- Document compartment in lid

Delivery:

contains no tools



Contents not included

Internal length x internal width x internal height	430 x 340 x 170 mm
Material	ABS
Capable of flying	No
55480... Ident. No.	010

Prod. Gr. 598

ORION® Tool assortment

Files and saws, 11-piece

Delivery:

1	flat blunt-end file 300 mm, cut 1	1	square files 250 mm, cut 2
1	flat blunt-end file 300 mm, cut 3	1	half-round file 250 mm, cut 2
1	triangular file 250 mm, cut 1	1	file brush
1	triangular file 250 mm, cut 3	1	saw bow 300 mm
1	round file 250 mm, cut 2	1	bi-metal saw blade
		1	chip brush

52561... | Ident. No. 010

Prod. Gr. 6AF



CHOOSE FROM OVER
70,000 PRODUCTS.

WE HAVE WHAT IT TAKES.



For a complete range of products that meet the toughest demands, visit www.iconridge.com

Hand guard



Leather protective gloves

ORION® Protective gloves (EN standard 388) EN 388

Application:

for working with high mechanical loads

Technical data:

- Category: II
- EN standard: 420 | 388
- Backing material: Pigskin

Execution:

- with cotton on the back of the hand for optimum breathability



Size	8	9	10
55551...	008	009	010
Ident. No.	●	●	●

Prod. Gr. 565



Cabinets



Wing-door cabinets

Workbenches



Drawer workbenches



Workbench construction accessories

Installation



Tool trolleys



Tool assortments

Environment + disposal



Cleaning station

Lifting equipment



Positioner

ORION® Wing door cabinets with solid sheet metal doors, height 1950 mm

With shelves

Application:

For secure and clearly arranged storage of tools, accessories, files or many other parts.

Execution:

- Robust, spot-welded steel sheet structure
- Safety bevells to prevent injuries
- 2 reinforced hinged doors, mounted on 4 stable, internal pivot pins
- 4 galvanised shelves, load capacity 60 kg, height adjustable in 180 mm grid
- Lockable, with three-point security levers and black turning handle with cylinder security lock, incl. 2 keys

Technical data:

- Number of shelves: 4 PCS
- Load-carrying capacity per shelf: 60 kg
- Load-carrying capacity: 400 kg
- With partition wall: No
- Central locking: Yes
- Lock type: Twist-grip lock with three-point fastening
- Material: Sheet steel
- Surface: Powder-coated



Width (mm)					950
Depth (mm)					450
Height (mm)					1950
	Door design	Colour of front	Body colour		
50100...	Full-sheet panel	Light grey RAL 7035	Light grey RAL 7035	Ident. No.	090 ○

Prod. Gr. 586





ORION drawer workbenches
With beech multiplex panel, 40 mm thick, drawer with 80% partial extension

Design:

- Workbench top panel, beech multiplex
- Worktop panel length 1500 and 2000 mm, depth x thickness 750 x 40 mm, working height 840 mm
- Optionally with lowerable transport wheels
- Robustly welded sheet steel construction, base made of square steel tube 45 x 45 x 2 mm, with level compensation
- Total load capacity of 800 kg when stationary, 400 kg when mobile, with evenly distributed load



Workbench 1500



Workbench 1500 mobile



Workbench 2000

Standard features:

<p>Workbench top panel in multiplex beech, 40 mm thick</p>	<p>Drawers with 80% partial extension aluminium grip strips, paper and cellophane strips</p>	<p>Drawers with slotted walls, load capacity 70 kg per drawer</p>
<p>Door opening angle 180°</p>	<p>Central lock, incl. 2 keys</p>	<p>Base made of square steel tube, 45 x 45 x 2 mm with level compensation on all four feet</p>

Powder-coated surface: Body as well as fronts RAL 7035 light grey

ORION® Cabinet workbench 1500
beech multiplex, 1500 mm, 1 drawer with partial extension, 1 door

Execution:

- Robustly welded sheet steel construction
- Frame made of square steel tube 45 x 45 x 2 mm, with level compensation

Notes:

To order customised hard foam inserts, please use the following clear internal dimensions: W x D: 478 mm x 586 mm

Technical data:

- Material of the worktop: Multiplex beech
- Plate length: 1500 mm
- Panel depth: 750 mm
- Board thickness: 40 mm
- Working height: 840 mm
- Number of drawers: 1 PCS
- Draw width (inner dimension): 490 mm
- Drawer depth (inner dimension): 598 mm
- Pullout type: Partial extension
- Load-carrying capacity per drawer: 70 kg
- Number of doors: 1 PCS
- With single pull-out safety brake: No
- Load-carrying capacity: 800 kg
- Lock type: Cylinder lock
- Surface: Powder-coated



	Body colour	Colour of front		
50 100...	Light grey RAL 7035	Light grey RAL 7035	Ident. No.	121 ○

Prod. Gr. 586

ORION® Cabinet workbench 1500
 beech multiplex, 1500 mm, 2 drawers with partial extension, 2 doors

Execution:

- Robustly welded sheet steel construction
- Frame made of square steel tube 45 x 45 x 2 mm, with level compensation

Notes:

To order customised hard foam inserts, please use the following clear internal dimensions: W x D: 478 mm x 586 mm

Technical data:

- Material of the worktop: Multiplex beech
- Plate length: 1500 mm
- Panel depth: 750 mm
- Board thickness: 40 mm
- Working height: 840 mm
- Number of drawers: 2 PCS
- Draw width (inner dimension): 490 mm
- Drawer depth (inner dimension): 598 mm
- Pullout type: Partial extension
- Load-carrying capacity per drawer: 70 kg
- Number of doors: 2 PCS
- With single pull-out safety brake: No
- Load-carrying capacity: 800 kg
- Lock type: Cylinder lock
- Surface: Powder-coated



	Body colour	Colour of front		
50100...	Light grey RAL 7035	Light grey RAL 7035	Ident. No.	122 ○

Prod. Gr. 586

ORION® Cabinet workbench 1500
 beech multiplex, 1500 mm, 3 drawers with partial extension, 1 door

Execution:

- Robustly welded sheet steel construction
- Frame made of square steel tube 45 x 45 x 2 mm, with level compensation

Notes:

To order customised hard foam inserts, please use the following clear internal dimensions: W x D: 478 mm x 586 mm

Technical data:

- Material of the worktop: Multiplex beech
- Plate length: 1500 mm
- Panel depth: 750 mm
- Board thickness: 40 mm
- Working height: 840 mm
- Number of drawers: 3 PCS
- Draw width (inner dimension): 490 mm
- Drawer depth (inner dimension): 598 mm
- Pullout type: Partial extension
- Load-carrying capacity per drawer: 70 kg
- Number of doors: 1 PCS
- With single pull-out safety brake: No
- Load-carrying capacity: 800 kg
- Lock type: Cylinder lock
- Surface: Powder-coated



	Body colour	Colour of front		
50100...	Light grey RAL 7035	Light grey RAL 7035	Ident. No.	123 ○

Prod. Gr. 586

ORION® Cabinet workbench 1500
 beech multiplex, 1500 mm, 6 drawers with partial extension

Execution:

- Robustly welded sheet steel construction
- Frame made of square steel tube 45 x 45 x 2 mm, with level compensation

Notes:

To order customised hard foam inserts, please use the following clear internal dimensions: W x D: 478 mm x 586 mm

Technical data:

- Material of the worktop: Multiplex beech
- Plate length: 1500 mm
- Panel depth: 750 mm
- Board thickness: 40 mm
- Working height: 840 mm
- Number of drawers: 6 PCS
- Draw width (inner dimension): 490 mm
- Drawer depth (inner dimension): 598 mm
- Load-carrying capacity per drawer: 70 kg
- With single pull-out safety brake: No
- Load-carrying capacity: 800 kg
- Lock type: Cylinder lock
- Surface: Powder-coated



	Body colour	Colour of front		
50100...	Light grey RAL 7035	Light grey RAL 7035	Ident. No.	124 ○

Prod. Gr. 586

ORION® Cabinet workbench 1500 with lowerable wheels

With 6 drawers with 80% partial extension

Application:

The mobile workstation with versatile options for use.

Execution:

- Robustly welded sheet steel construction
- Frame made of square steel tube 45 x 45 x 2 mm, with level compensation
- Door opening angle 180°

Advantage:

- Can be lifted, lowered and moved in all directions by simply moving the lever on the workbench
- In lowered state absolutely tilt-proof on four feet

Technical data:

- Material of the worktop: Multiplex beech
- Plate length: 1500 mm
- Panel depth: 750 mm
- Board thickness: 40 mm
- Working height: 840 mm
- With single pull-out safety brake: No
- With single-locking drawers: No
- Number of doors: 1 PCS
- On castors: Yes
- Moving device, can be lowered: Yes
- With sliding handle: No
- Load-carrying capacity: 800 kg
- Dynamic load-carrying capacity: 400 kg
- Number of fixed rollers: 2 PCS
- Number of steering rollers: 2 PCS
- With wheel lock: No
- Material of the wheel: Polyamide
- Wheel diameter: 80 mm
- Central locking: Yes
- Lock type: Cylinder lock
- Material: Sheet steel
- Surface: Powder-coated



Number of drawers (PCS)				1
Pullout type				Partial extension
Load-carrying capacity per drawer (kg)				70
Draw width (inner dimension) (mm)				490
Drawer depth (inner dimension) (mm)				598
	Body colour	Colour of front	Ident. No.	
50100...	Light grey RAL 7035	Light grey RAL 7035		131 ○

Prod. Gr. 586

ORION® Cabinet workbench 2000

beech multiplex, 2000 mm, 6 drawers with partial extension, 1 shelf

Execution:

- Robustly welded sheet steel construction
- Frame made of square steel tube 45 x 45 x 2 mm, with level compensation

Notes:

To order customised hard foam inserts, please use the following clear internal dimensions: W x D: 478 mm x 586 mm

Technical data:

- Material of the worktop: Multiplex beech
- Plate length: 2000 mm
- Panel depth: 750 mm
- Board thickness: 40 mm
- Working height: 840 mm
- Number of drawers: 6 PCS
- Draw width (inner dimension): 490 mm
- Drawer depth (inner dimension): 598 mm
- Pullout type: Partial extension
- Load-carrying capacity per drawer: 70 kg
- With single pull-out safety brake: No
- Load-carrying capacity: 800 kg
- Lock type: Cylinder lock
- Surface: Powder-coated



	Body colour	Colour of front	Ident. No.	
50100...	Light grey RAL 7035	Light grey RAL 7035		161 ○

Prod. Gr. 586

ORION® Cabinet workbench 2000

beech multiplex, 2000 mm, 3 drawers with partial extension, 2 doors

Execution:

- Robustly welded sheet steel construction
- Frame made of square steel tube 45 x 45 x 2 mm, with level compensation

Notes:

To order customised hard foam inserts, please use the following clear internal dimensions: W x D: 478 mm x 586 mm

Technical data:

- Material of the worktop: Multiplex beech
- Plate length: 2000 mm
- Panel depth: 750 mm
- Board thickness: 40 mm
- Working height: 840 mm
- Number of drawers: 3 PCS
- Draw width (inner dimension): 490 mm
- Drawer depth (inner dimension): 598 mm
- Pullout type: Partial extension
- Load-carrying capacity per drawer: 70 kg
- Number of doors: 2 PCS
- With single pull-out safety brake: No
- Load-carrying capacity: 800 kg
- Lock type: Cylinder lock
- Surface: Powder-coated



	Body colour	Colour of front	Ident. No.	
50100...	Light grey RAL 7035	Light grey RAL 7035		162 ○

Prod. Gr. 586

ORION® Cabinet workbench 2000

beech multiplex, 2000 mm, 5 drawers with partial extension, 2 doors

Execution:

- Robustly welded sheet steel construction
- Frame made of square steel tube 45 x 45 x 2 mm, with level compensation

Notes:

To order customised hard foam inserts, please use the following clear internal dimensions: W x D: 478 mm x 586 mm

Technical data:

- Material of the worktop: Multiplex beech
- Plate length: 2000 mm
- Panel depth: 750 mm
- Board thickness: 40 mm
- Working height: 840 mm
- Number of drawers: 5 PCS
- Draw width (inner dimension): 490 mm
- Drawer depth (inner dimension): 598 mm
- Pullout type: Partial extension
- Load-carrying capacity per drawer: 70 kg
- Number of doors: 2 PCS
- With single pull-out safety brake: No
- Load-carrying capacity: 800 kg
- Lock type: Cylinder lock
- Surface: Powder-coated



	Body colour	Colour of front		Ident. No.	163
50100...	Light grey RAL 7035	Light grey RAL 7035			○

Prod. Gr. 586

ORION® Cabinet workbench 2000

Beech multiplex, 2000 mm, 5 drawers with partial extension, 1 door, 1 shelf

Execution:

- Robustly welded sheet steel construction
- Frame made of square steel tube 45 x 45 x 2 mm, with level compensation

Notes:

To order customised hard foam inserts, please use the following clear internal dimensions: W x D: 478 mm x 586 mm

Technical data:

- Material of the worktop: Multiplex beech
- Plate length: 2000 mm
- Panel depth: 750 mm
- Board thickness: 40 mm
- Working height: 840 mm
- Number of drawers: 5 PCS
- Draw width (inner dimension): 490 mm
- Drawer depth (inner dimension): 598 mm
- Load-carrying capacity per drawer: 70 kg
- Number of doors: 1 PCS
- With single pull-out safety brake: No
- Load-carrying capacity: 800 kg
- Lock type: Cylinder lock
- Surface: Powder-coated



	Body colour	Colour of front		Ident. No.	164
50100...	Light grey RAL 7035	Light grey RAL 7035			○

Prod. Gr. 586



power strips for workbenches

version:

housing made of sheet steel, height 170 mm, depth 90 mm, length 800-4050 mm. for fitting with components according to illustration.

delivery:

- unwired
- for length 2800 mm: two-piece; for length 4050 mm: three-piece



- ① illuminated one/off switch 2-pin
- ② Schuko socket with cap 2-pin + E 10/16 A 230 V 50 Hz
- ③ CEE socket 16 A 400 V/50 Hz with cap 5-pin
- ④ circuit breaker 1-pin B 16 A
- ⑤ circuit breaker 3-pin C 16 A
- ⑥ screw fuse element Neozed 3-pin without fuse
- ⑦ fault current circuit breaker (FI) 25 A 30 mA 230 V
- ⑧ fault current circuit breaker (FI) 25 A 30 mA 400 V
- ⑧ emergency stop button without key
- ⑨ emergency stop button with key
- ⑩ pole terminal 4 mm black
- ⑪ earthing socket yellow/green 4 mm
- ⑫ earthing socket 4 mm red
- ⑬ compressed air quick-release coupling

➔ individual fitting of power strip on request.

Drawer insert material for ORION workbenches

Application:

Ident. No. 112–114: For HK workbenches series L, for drawer front height 180 mm.

Ident. No. 116: For HK workbenches, series L, for drawer front height 180 mm.

Ident. No. 120: For ORION workbenches, front height 180 mm.

Ident. No. 130–135: For ORION workbenches, drawer front height 180 mm.

Execution:

▪ **Ident. No. 120:** Oil-resistant

▪ **Ident. No. 130–135:**

- in high-quality ABS plastic
- Colour black

Technical data:

▪ For drawer cabinet height: 180 mm



Ident. No. 112



Ident. No. 114



Ident. No. 116



Ident. No. 120



Ident. No. 130



Ident. No. 135

	50199...	6 compartments	Ident. No.	112 ○
	50199...	12 compartments	Ident. No.	114 ○
	50199...	16 compartments	Ident. No.	116 ○
	50199...	Ribbed rubber mat	Ident. No.	120 ●
AQURADO	50199...	Boxes 48 mm high	Ident. No.	130 ●
AQURADO	50199...	Boxes 24 mm high	Ident. No.	135 ●

AQURADO = Prod. Gr. 581

HK = Prod. Gr. 586

Soft PVC support, transparent For workbenches

Application:

Protects the work surface from soiling and damage.

Execution:

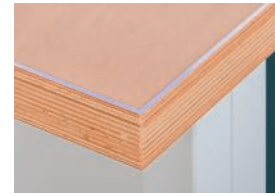
- Free from DOP, cadmium and silicone
- Fire protection class B2 in line with DIN 4102

Notes:

Custom-cut and on-the-roll products up to max. 20 m available upon request

Technical data:

- Colour: Transparent
- Min. temperature resistance: -30 °C
- Max. temperature resistance: 60 °C



Length (mm)		1500	2000	1500	2000	1500	2000
Depth (mm)		750	750	700	700	800	800
Total thickness (mm)		3	3	3	3	3	3
50233...	Ident. No.	915	920	905	910	928	930

Prod. Gr. 504

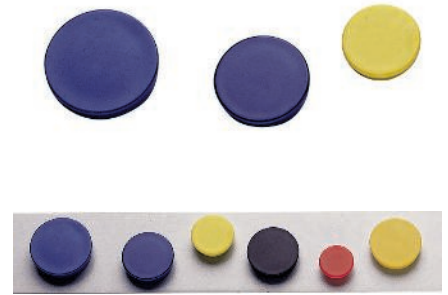
ORION® Organising magnets

Application:

For fixing drawings and other paper documents to magnetic surfaces.

Execution:

- Magnetic clamp with coloured plastic cap



Outer Ø (mm)			20	25	30	34
	Colour					
51161...	Blue	Ident. No.	010	060	110	155
51161...	Yellow	Ident. No.	020	070	120	160
51161...	Red	Ident. No.	030	080	130	170
51161...	Black	Ident. No.	040	090	140	180
51161...	White	Ident. No.	050	100	150	190

Prod. Gr. 591

ORION® Decorative magnets

Application:

For attaching a variety of objects to magnetic surfaces.

Execution:

- Adhesive magnet with hook
- Painted white



Outer Ø (mm)			20	25	32	40
	Colour					
51161...	White	Ident. No.	200	210	220	230

Prod. Gr. 591

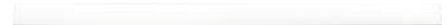
ORION® Wall strips

Application:

Used as a base under magnetic clamps.

Execution:

- White
- Self-adhesive



Width of band (mm)			50	50	35
	Length of tape (m)		0.5	1	5
	Colour				
51161...	White	Ident. No.	300	310	320

Prod. Gr. 591

ORION® Magnetic tapes

Application:

For labelling with water-soluble permanent fibre tip pen, applications e.g. shelves, cabinets, organisational boards etc.

Technical data:

- Length of tape: 10 m



Width of band (mm)			20	30
	Colour			
51162...	Blue	Ident. No.	010	110
51162...	Yellow	Ident. No.	020	120
51162...	Red	Ident. No.	030	130
51162...	White	Ident. No.	040	140

Prod. Gr. 591

ORION® Hard foam inserts equipped with ORION tools

Width 232 mm, depth 332 mm, for HK tool trolley

Application:
for the flexible and modular equipping of drawers in the HK tool trolley no. 50278 800.

Execution:

- two-tone foam inserts made of polyethylene (PE) equipped with tool assortments
- resistant against most oils and chemicals due to closed cells
- the PE foam is lightweight, resistant, durable, odour-neutral and even food safe
- one tool insert fills half of the useful area of a drawer with internal dimensions 475 x 345 mm

- two tool inserts fill the entire useful area of a drawer with internal dimensions 475 x 345 mm

Technical data:

- Depth: 332 mm
- Width: 232 mm
- Height: 31 mm
- Material: PE - Polyethylene
- Colour of top hard foam inlay: Black
- Colour of bottom hard foam inlay: Grey
- Suitable for drawer: 65 mm



Ident. No. 845



Ident. No. 849



Ident. No. 858



Ident. No. 872



Ident. No. 875



Ident. No. 878



Ident. No. 885

Composition of set

1 ORION slotted screwdriver 7 pieces 2.5/3/3.5/4/5.5/6.5/8	50537...	●
1 ORION Phillips screwdriver 8 pieces PH 0/PH 1/PH 2/PH 3/PZ 0/PZ 1/PZ 2/PZ 3	845	●
1 ORION combination spanner 17 pieces width a.f. 6/7/8/9/10/11/12/13/14/15/16/17/18/19/20/22/24 mm	849	●
ORION socket wrench set 3/8 inch 23 pcs	858	●
ORION socket wrench set 1/4 inch 31 pcs	872	●
ORION socket wrench set 1/2 inch 24 pcs	875	●
1 ORION vernier callipers 150 mm, ORION micrometer 0-25 mm, ORION spring divider 125 mm, ORION radius gauge R1-7 mm, ORION radius gauge R7.5-15 mm, ORION feeler gauge 13-sheet DIN 2275, ORION pocket tape measure 3 m, ORION spring steel strip ruler 300 mm	878	●
	885	●

Prod. Gr. 547

ORION® Hard foam insert equipped with tools, hammer, saw set

Width 467 mm, depth 332 mm, for HK tool trolley

Application:
for the flexible and modular equipping of drawers in the HK tool trolley no. 50278 800.

Execution:

- two-tone foam inserts made of polyethylene (PE) equipped with tool assortments
- resistant against most oils and chemicals due to closed cells
- the PE foam is lightweight, resistant, durable, odour-neutral and even food safe
- the tool insert fills the entire useful area of a drawer with internal dimensions 475 x 345 mm

- Composition of set: 1 ORION soft-face hammer 30 mm, ORION machinist's hammer 0.5 kg, ORION flat chisel 150 mm, ORION flat chisel 200 mm, ORION parting chisel 125 x 10 x 2 mm, ORION pin punch 3 mm, ORION pin punch 5 mm, ORION pin punch 8 mm, ORION centre punch 120 x 10 mm, ORION metal saw bow with blade, ATORN handsaw blades 10 pieces
- Depth: 332 mm
- Width: 467 mm
- Height: 31 mm
- Material: PE - Polyethylene
- Colour of top hard foam inlay: Black
- Colour of bottom hard foam inlay: Grey
- Suitable for drawer: 65 mm



Technical data:

50537...	Ident. No.	895
----------	------------	-----

Prod. Gr. 547



Hard foam insert

A perfectly organised workplace increases productivity and safety in every process. For optimal performance, this perfect organisation must be maintained down to the last detail. Hard foam inserts can help: Already equipped with high-quality tools or individually planned, the inserts maintain order down to the tiniest screw. High-quality materials and the latest technology allow detailed outlines and a wide range of different cavities to be cut – always near to the surface for easy removal. Each part has its dedicated space. Hard foam inserts also secure the contents during storage and transport. The two-tone material lets you see at a glance if an item is missing.

A strong material



PE-foam is lightweight yet resilient.



Furthermore it is oil-resistant and water-resistant.



It also has shock-absorbing properties.



The hard foam is durable, odour-free and even suitable for use with foodstuffs.



ESD foam is available for electronic parts.

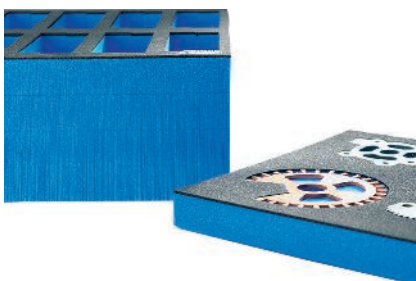


Use the laser engraver to add your personal signature and give the hard foam insert an individual finish.

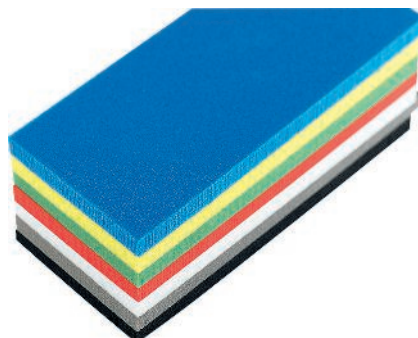
Versatile applications – many possibilities



The largest available hard foam insert is 1500 mm long and 1000 mm wide. Almost all dimensions and shapes smaller than this are possible.



Standard versions of the material are 30 mm, 60 mm or 90 mm thick. Individual versions are possible with smaller and larger thicknesses up to a maximum of 210 mm.



There are many colour options available. The black surface layer can be combined with the following contrasting colours: Standard blue, as well as the optional colours red, green, yellow, white or grey.

ORION® Tool assortment
Files and saws, 11-piece**Delivery:**

- | | |
|-------------------------------------|---------------------------------|
| 1 flat blunt-end file 300 mm, cut 1 | 1 square files 250 mm, cut 2 |
| 1 flat blunt-end file 300 mm, cut 3 | 1 half-round file 250 mm, cut 2 |
| 1 triangular file 250 mm, cut 1 | 1 file brush |
| 1 triangular file 250 mm, cut 3 | 1 saw bow 300 mm |
| 1 round file 250 mm, cut 2 | 1 bi-metal saw blade |
| | 1 chip brush |

52561... | Ident. No. 010

Prod. Gr. 6AF



ORION® Dustpans

Execution:

- **Ident. No. 500:**
 - With wooden handle
 - No lip
 - Painted black
 - Dustpan size: 220 x 200 mm

▪ **Ident. No. 510:**

- Metal dustpan and handle
- With rubber lip

Technical data:

- Material: Sheet steel



Ident. No. 500



Ident. No. 510

Material of the grip handle	Wood	Metal
56750...	Ident. No. 500	Ident. No. 510
	●	●

Prod. Gr. 598

ORION® Wooden hand brush



Ident. No. 610



Ident. No. 620

Material of the bristles	Coconut	Coconut	Horsehair	Horsehair
Length (mm)	280	430	280	430
56737...	Ident. No. 520	Ident. No. 620	Ident. No. 510	Ident. No. 610
	●	●	●	●

Prod. Gr. 598

ORION® Factory and workshop broom

Application:

- Ident. No. 010–020, 050–060:** For dry floors
- Ident. No. 030–040:** For concrete, industrial and wooden floors
- Ident. No. 070–080:** For rough indoor and outdoor floors

Execution:

- **Ident. No. 030–040:** Resistant to oil and alkalis
- **Ident. No. 070–080:** Wet- and oil-resistant fibres

Delivery:

With handle holder, without handle; please order separately



Ident. No. 010–020



Ident. No. 030–040



Ident. No. 050–060



Ident. No. 070

		Factory and workshop broom								Brooms, handles, squeegees, window wipers, device holders	
Material of the bristles		Coconut		Elaston		Artificial fibre bristle		Arenga			
Width (mm)		56760... Ident. No.		56760... Ident. No.		56760... Ident. No.		56760... Ident. No.		56760... Ident. No.	
400		010	●	030	●	050	●	070	●	110	●
600		020	●	040	●	060	●	080	●	120	●

Prod. Gr. 598

ORION® Spring balances with load capacity of 0.5-2.0 kg
 Type 5200, cable extension 2000 mm

Application:

For the ergonomic support of assembly operations. Spring pullers keep tools close at hand at all times during assembly and at the same time ensure that the workplace is tidy. The spring balances are designed in such a way that each work tool is automatically pulled back to the original position after use. Suitable for lightweight tools.

Execution:

- Housing made of impact-resistant plastic
- Carrying capacity easy to adjust via hand wheel
- Suspension with robust steel eyelet, riveted special spring
- Polyamide cable
- 2000 mm cable extension

Advantage:

- Effortless work
- Saves space, lightweight design
- Low cost

Technical data:

- With overrotation protection: No
- Number of springs: 1 PCS
- Spring design: Special mainspring
- Spring breakage protection: No
- Max. cable pull-out length: 2000 mm
- Adjustable cord length: No
- Wire cable diameter: 2 mm
- Replaceable cord: No
- Cord in-feed restriction: Rubber ball, absorbs impacts
- Cable drum material: Abrasion-proof plastic
- With automatic locking: No
- Suspension type: Ring grommet
- Load attachment: Karabiner hook
- Material of the housing: Plastic
- Housing width: 112 mm
- Housing thickness: 55 mm
- Height: 225 mm



Min./max. load-carrying capacity		0.5-1.2 kg	1-2 kg
Model		5200/1	5200/2
77005...	Ident. No.	010	020

Prod. Gr. 794



Files



Workshop files

Roughing and cutting



Cutting discs

Sanding



Abrasive flap discs



Flap wheels, fleece sanding tips

Precision grinding and dressing



Grinding discs and cup grinding discs



Cleaning stones



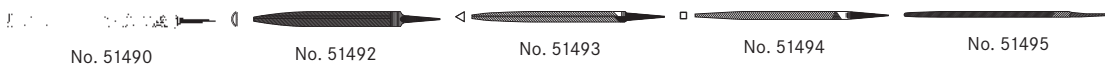
Manual lapping tool

ORION® Flat hand engineer's files

DIN 7261 A/E/C/D/F

Application:

For manual material removal with steel materials.



File cut					1	2	3
	Form	File blade length (mm)	Width (mm)	Thickness (mm)			
51490...	Equalling	100	12.0	3.0	Ident. No.	110	210 310
51490...	Equalling	150	16.0	4.0	Ident. No.	115	215 315
51490...	Equalling	200	20.0	5.0	Ident. No.	120	220 320
51490...	Equalling	250	25.0	6.3	Ident. No.	125	225 325
51490...	Equalling	300	30.0	7.0	Ident. No.	130	230 330
51490...	Equalling	350	35.0	7.5	Ident. No.	135	235 335
51490...	Equalling	400	39.0	9.0	Ident. No.	140	- -
51492...	Half-round	100	11.0	4.0	Ident. No.	110	- 310
51492...	Half-round	150	16.0	5.0	Ident. No.	115	215 315
51492...	Half-round	200	21.0	6.0	Ident. No.	120	220 320
51492...	Half-round	250	25.0	7.0	Ident. No.	125	225 325
51492...	Half-round	300	30.0	9.0	Ident. No.	130	230 330
51493...	Triangle	150	12.0		Ident. No.	115	215 315
51493...	Triangle	200	15.0		Ident. No.	120	220 320
51493...	Triangle	250	18.0		Ident. No.	125	225 325
51493...	Triangle	300	21.0		Ident. No.	130	230 -
51493...	Triangle	100	8.7		Ident. No.	-	- 310
51494...	Square-cut	100	4.0		Ident. No.	110	- -
51494...	Square-cut	150	6.3		Ident. No.	115	215 315
51494...	Square-cut	200	8.0		Ident. No.	120	220 320
51494...	Square-cut	250	10.0		Ident. No.	125	225 325
51494...	Square-cut	300	12.5		Ident. No.	130	230 -
51495...	Round	100		4	Ident. No.	110	210 310
51495...	Round	150		6.3	Ident. No.	115	215 315
51495...	Round	200		7.1	Ident. No.	120	220 320
51495...	Round	250		9.2	Ident. No.	125	225 325
51495...	Round	300		12.5	Ident. No.	130	230 -

Prod. Gr. 6AF

ORION® Key file set

Application:

For precise manual material removal with all metal materials.

Delivery:

6-piece, in sheet metal box, with handle, in the following shapes: flat blunt-ended, flat pointed, half-round, triangular, square and round

Technical data:

- File blade length: 100 mm
- File cut: 2
- Number of pieces in assortment/set: 6 PCS



51451...

Ident. No.

010

Prod. Gr. 6AF

ORION® Cutting discs for stainless steel – extra thin A 46 T 11-BF 130

Application:
For cutting stainless steel.

- Technical data:**
- Bore diameter: 22.23 mm
 - Version: Hard
 - Free from iron and sulphur: Yes



Ident. No. 115, 125, 230

Washer Ø (mm)	Washer thickness (mm)	Max. rotation speed (U/min(rpm))	Number of pieces per packet (PCS)	Form	
				Straight	Ident. No.
115	1.0	1330	50	115	●
115	1.5	1330	50	118	●
125	1.0	12250	50	125	●
125	1.5	12250	50	128	●
180	1.5	8500	25	180	●
230	1.9	6650	25	230	●

Prod. Gr. 6LH

ORION® Cutting discs for steel – extra thin Type A 60 S-BF T41

Application:
For cutting thin-walled pipes, sheet steel and profiles.

- Technical data:**
- Bore diameter: 22.23 mm
 - Version: Hard
 - Number of pieces per packet: 25



Washer Ø (mm)	Washer thickness (mm)	Max. rotation speed (U/min(rpm))	Form	
			Straight	Ident. No.
115	1.0	13300	315	●
125	1.0	12200	325	●
180	1.6	8500	380	●

Prod. Gr. 6LH

ORION® Cutting discs for steel Type A 24 P-BF 130

Application:
Suitable for a wide range of uses, such as for cutting pipes, sheet metal and steel sections.

- Technical data:**
- Washer thickness: 3.0 mm
 - Bore diameter: 22.23 mm
 - Version: Hard
 - Free from iron and sulphur: No
 - Number of pieces per packet: 25 PCS



Ident. No. 125-180

Washer Ø (mm)	Max. rotation speed (U/min(rpm))	Form		Straight	
		Cranked	Ident. No.	Ident. No.	Ident. No.
115	13300	115	●	-	-
125	12250	125	●	-	-
180	8500	-	-	180	●
230	6650	-	-	230	●

Prod. Gr. 6LH



ARE YOU LOOKING FOR
EVEN MORE BRANDS?

WE HAVE WHAT IT TAKES.

For a complete range of products that meet the toughest demands, visit www.iconridge.com

ORION® Abrasive flap disc for stainless steel/steel with zirconia alumina, tool carrier made of fibre glass

Application:
for deburring, removing rust, fettling and for preparatory and finishing work on weld seams.

- with OSA approval – greater safety due to regular independent product tests

Advantage:

- attractively-priced abrasive flap disc with good cutting performance

Technical data:

- Number of pieces per packet: 10



Washer Ø (mm)		115	115	115	125	125	125
Grain size		40	60	80	40	60	80
76084...	Ident. No.	915	917	919	935	937	939

Prod. Gr. 6LH

ORION® Abrasive flap discs Made of zirconia alumina, tool carrier made of plastic, for inox/steel/cast iron

Application:
for smoothing, removing rust, grinding and similar surface applications.

Advantage:

- Highly elastic backing adapts perfectly to the workpiece surface
- For especially smooth and flat surfaces, such as for surface grinding of large plants

Execution:

- CAL zirconium: Cooling agent layer for cooler grinding

Technical data:

- Bore diameter: 22.23 mm
- Number of pieces per packet: 10 PCS



Washer Ø (mm)		115	115	115	115	125	125	125	125	
Max. rotation speed (U/min(rpm))		13200	13200	13200	13200	11800	11800	11800	11800	
Grain size		40	60	80	120	40	60	80	120	
	Form									
76084...	Diagonal	Ident. No.	740	760	780	795	840	860	880	895

Prod. Gr. 6LH

ORION® Synthetic corundum flap wheels For use on flexible shafts and electrical or pneumatic straight grinders

Application:
For machining fittings made of light or heavy metal, for use in tool making, for press, casting and die cast moulds and similar.

- Adjusts to the shape of the workpiece during grinding

Execution:

- Plastic-bonded abrasive cloth discs
- Cast resin core

Technical data:

- Binding: Plastic
- Shaft diameter: 6 mm
- Number of pieces per packet: 10 PCS



Shaft Ø x shaft length		6 x 40 mm		6 x 40 mm		6 x 40 mm		6 x 40 mm		6 x 40 mm		6 x 40 mm			
Head Ø x head length	Recommended rotation speed (U/min(rpm))	Grain size 40		Grain size 60		Grain size 80		Grain size 120		Grain size 150		Grain size 240			
		Ident. No.		Ident. No.		Ident. No.		Ident. No.		Ident. No.		Ident. No.			
30 x 5 mm	16000	600	●	602	●	604	●	606	●	608	●	610	●	612	●
30 x 10 mm	16000	620	●	622	●	624	●	626	●	628	●	630	●	632	●
30 x 15 mm	16000	640	●	642	●	644	●	646	●	648	●	650	●	652	●
40 x 15 mm	13000	680	●	682	●	684	●	686	●	688	●	690	●	692	●
40 x 20 mm	13000	700	●	702	●	704	●	706	●	708	●	710	●	712	●
50 x 15 mm	11000	740	●	742	●	744	●	746	●	748	●	750	●	752	●
50 x 20 mm	11000	760	●	762	●	764	●	766	●	768	●	770	●	772	●
50 x 30 mm	11000	780	●	782	●	784	●	786	●	788	●	790	●	792	●
60 x 20 mm	9000	820	●	822	●	824	●	826	●	828	●	830	●	832	●
60 x 30 mm	9000	840	●	842	●	844	●	846	●	848	●	850	●	852	●
80 x 30 mm	6000	940	●	942	●	944	●	946	●	948	●	950	●	952	●
80 x 50 mm	6000	980	●	982	●	984	●	986	●	988	●	990	●	992	●

Prod. Gr. 6LH

ORION® Mini flap wheels

For use on flexible shafts and electrical or pneumatic straight grinders

Application:

For machining in hard-to-reach places and of very small surfaces, e.g. fittings produced from light or heavy metal, for use in tool making, for press, casting and die cast moulds and similar.

Execution:

- Plastic-bonded abrasive cloth discs

- Cast resin core
- Adjusts to the shape of the workpiece during grinding

Technical data:

- Binding: Plastic
- Number of pieces per packet: 10 PCS



Head Ø x head length	Shaft Ø (mm)	Recommended rotation speed (U/min(rpm))	Grain size		
			80	120	150
			76042... Ident. No.	76042... Ident. No.	76042... Ident. No.
10 x 10 mm	3	26000	008 ●	012 ●	015 ●
15 x 15 mm	3	24000	058 ●	062 ●	065 ●
15 x 15 mm	6	24000	108 ●	112 ●	115 ●
20 x 10 mm	3	20000	158 ●	162 ●	165 ●
20 x 10 mm	6	20000	208 ●	212 ●	215 ●
20 x 15 mm	3	20000	258 ●	262 ●	265 ●
20 x 15 mm	6	20000	308 ●	312 ●	315 ●

Prod. Gr. 6LH

ORION® Abrasive fleece sanding tips

Shank diameter 6 mm

Application:

Ident. No. 220–330: Ideal for matting and satin-finishing in conjunction with straight grinders, flexible shafts and electronic drills.

Ident. No. 400–515: Universal for metal machining and stainless steel using straight grinders, flexible shafts and electronic drills.

- Ident. No. 220–330:** Produces a finer grinding finish
- Ident. No. 400–515:** Produces a coarser grinding finish as the combination of abrasive fleece and flakes achieves a higher removal rate

Advantage:

- Even finish over entire service life

Execution:

- Corundum with synthetic resin bond

	Head Ø x head length	Grain size	Surface structure	Max. rotation speed (U/min(rpm))	Number of pieces per packet (PCS)	76045... Ident. No.
	40 x 20 mm	-	Rough	12200	10	220 ●
	40 x 20 mm	-	Medium	12200	10	225 ●
	40 x 20 mm	-	Very fine	12200	10	230 ●
	50 x 30 mm	-	Rough	12200	10	250 ●
	50 x 30 mm	-	Medium	12200	10	255 ●
	50 x 30 mm	-	Very fine	12200	10	260 ●
	60 x 50 mm	-	Rough	10200	10	280 ●
	60 x 50 mm	-	Medium	10200	10	285 ●
	60 x 50 mm	-	Very fine	10200	10	290 ●
	80 x 50 mm	-	Rough	7600	10	310 ●
80 x 50 mm	-	Medium	7600	10	320 ●	
80 x 50 mm	-	Very fine	7600	10	330 ●	
	40 x 20 mm	60	-	12200	10	400 ●
	40 x 20 mm	100	-	12200	10	405 ●
	40 x 20 mm	150	-	12200	10	410 ●
	50 x 30 mm	60	-	12200	10	425 ●
	50 x 30 mm	100	-	12200	10	430 ●
	50 x 30 mm	150	-	12200	10	445 ●
	60 x 50 mm	60	-	10200	10	460 ●
	60 x 50 mm	100	-	10200	10	465 ●
	60 x 50 mm	150	-	10200	10	470 ●
	80 x 50 mm	60	-	7600	10	480 ●
	80 x 50 mm	100	-	7600	10	485 ●
	80 x 50 mm	150	-	7600	10	490 ●
	100 x 50 mm	60	-	6000	4	505 ●
	100 x 50 mm	100	-	6000	4	510 ●
	100 x 50 mm	150	-	6000	4	515 ●

Prod. Gr. 6LS

ORION® Bench grinder wheels
Ceramic bond, type 1



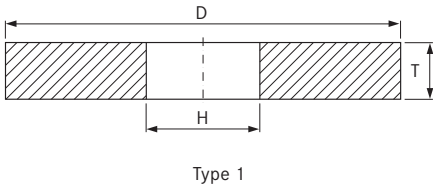
Application:
For machining hardened high-alloy and low-alloy steels and for regrinding HSS tools.

- Advantage:**
- smooth running
 - includes set of reducing rings

- in stackable individual packaging

Notes:
Maximum operating speed: 40 m/s. Not suitable for wet grinding.

- Technical data:**
- Form: 1



Material to be processed			High-alloy steel, hardened Low-alloy steel, hardened HSS	High-alloy steel, hardened Low-alloy steel, hardened HSS	High-alloy steel, hardened Low-alloy steel, hardened HSS	Cast metal Carbide	Non-alloy and low-alloy steel, unhardened	Non-alloy and low-alloy steel, unhardened	Cast metal Carbide
Material of abrasive medium			White fused aluminum oxide	White fused aluminum oxide	White fused aluminum oxide	Green silicon carbide	Normal corundum	Normal corundum	Green silicon carbide
Surface structure			Medium	Medium	Fine	Fine	Rough	Medium	Medium
Grid size			46	60	80	80	36	60	60
Scheiben-Ø D (mm)	Scheiben-dicke T (mm)	Bohrungs-Ø H (mm)	69496... Ident. No.	69496... Ident. No.	69496... Ident. No.	69496... Ident. No.	69496... Ident. No.	69496... Ident. No.	69496... Ident. No.
125	20	32	001 ●	003 ●	005 ●	015 ●	-	-	-
150	20	32	-	061 ●	065 ●	071 ●	051 ●	055 ●	-
175	20	32	-	111 ●	-	-	101 ●	105 ●	115 ●
200	20	32	201 ●	-	-	-	-	-	-
175	25	51	-	151 ●	155 ●	161 ●	141 ●	145 ●	-
200	25	51	-	-	251 ●	255 ●	241 ●	245 ●	-
200	32	32	263 ●	265 ●	267 ●	269 ●	259 ●	261 ●	-
200	32	51	-	281 ●	285 ●	291 ●	271 ●	275 ●	-
300	40	76	-	355 ●	-	360 ●	340 ●	345 ●	-

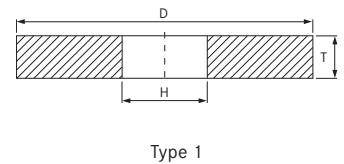
Prod. Gr. 6LO

ORION® Surface grinding wheels (ISO 525)
Ceramic bond



- Advantage:**
- Low wear
 - Cool grinding
 - Smooth cutting

Notes:
Ensure that an adequate coolant supply is available. Discs are not suitable for dry sanding. Recommended operating speed is: 20-30 m/s.



Material to be processed					Non-alloy and low-alloy steel, hardened Non-alloy and low-alloy steel, unhardened High-alloy steel, hardened High-alloy steel, unhardened	High-alloy steel, hardened HSS Stainless steel	Non-alloy and low-alloy steel, hardened Non-alloy and low-alloy steel, unhardened High-alloy steel, hardened High-alloy steel, unhardened
Material of abrasive medium					White fused aluminium oxide	Sintered aluminium oxide and white fused aluminium oxide	White fused aluminium oxide
Surface structure					Medium	Medium	Fine
Grid size					46	60	80
Form	Scheiben-Ø D (mm)	Scheibendicke T (mm)	Bohrungs-Ø H (mm)	Cut-out clearance	69496... Ident. No.	69496... Ident. No.	69496... Ident. No.
1	200	20	51	-	611	616	621
1	200	25	32	-	641	646	651
1	225	25	51	-	671	-	681
1	250	25	76.2	-	700	705	710
1	300	30	76.2	-	730	735	740
7	300	50	76.2	155 x 10 x 10 mm	760	-	770
1	350	50	127	-	800	805	810

Prod. Gr. 6LO

ORION® Cup grinding wheels (ISO 525)

Ceramic bond, type 6



Application:

For regrinding metal cutting tools such as drills, milling cutters etc. on tool and pattern making machines.

Execution:

Ident. No. 005-035:

- HSS and special steels = grain 60-80

- Low-alloy steels = grain 46-60

Advantage:

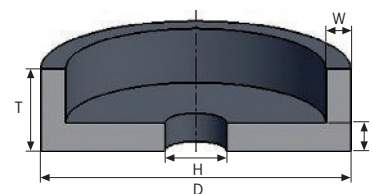
- cool grinding
- long service life
- superior surface finish

Notes:

Not suitable for wet grinding.



Ident. No. 055
Green silicon carbide



Type 6

Material to be processed					Non-alloy and low-alloy steel, hardened High-alloy steel, hardened HSS	Carbide		
Material of abrasive medium					White fused aluminium oxide	Green silicon carbide		
Grid size	Surface structure	Scheiben-Ø D (mm)	Scheibendicke T (mm)	Bohrungs-Ø H (mm)	Wanddicke W (mm)	Bodenstärke E (mm)	69472... Ident. No.	69472... Ident. No.
60	Medium	80	40	20	10	10	005	-
60	Medium	100	50	20	10	10	025	-
80	Fine	100	50	20	10	10	035	055

Prod. Gr. 6LO

ORION® Dressing stone for diamond and boron nitride sanding discs Type 9010, grain size 180

Execution:

- Made of white corundum
- Unground

Length x width x height	100 x 25 x 13 mm
60597...	Ident. No. 010

Prod. Gr. 601



ORION® Diamond multi-grain hand dressing tool For precise dressing and profiling of ceramic sanding discs

Execution:

- Ident. No. 010: For T-shaped peripheral wheels
- Ident. No. 020: for P-shape cup wheels



Ident. No. 010
Type T



Ident. No. 020
Type P

Form	Lining length x lining width	Length (mm)	Weight of diamond (carat)	61230... Ident. No.
T	25 x 8 mm	200	1.5	010 ●
P	25 x 8 mm	200	1.5	020 ●

Prod. Gr. 601

ORION® Diamond hand lapping tools For cemented carbide cutters

Application:

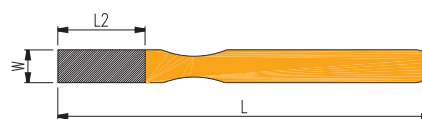
For the maintenance and re-machining of cemented carbide cutting edges.

Execution:

- Ident. No. 010-030: Highly wear-resistant and suitable for robust applications
- Ident. No. 040: Primarily designed for precision cutting operations

Advantage:

- Good grip
- High dimensional stability
- Long service life
- Use of the hand lapping tool increases the service life of the cemented carbide cutting edges



L2 x W	L (mm)	Grain size (µm)	Binding	Metal	Plastic
			Range of applications	For standard cutting and milling tools	For fine boring and precision turning tools
			60400... Ident. No.		60400... Ident. No.
30 x 8 mm	140	64	010 ●	-	-
40 x 12 mm	150	107	020 ●	-	-
40 x 12 mm	150	46	030 ●	-	-
30 x 9 mm	140	91	-	-	040 ●

Prod. Gr. 601

CHOOSE FROM OVER
70,000 PRODUCTS.

WE HAVE WHAT IT TAKES.

For a complete range of products that meet
the toughest demands, visit www.iconridge.com



Mains-operated power tools



Accessories for drilling and screwdriving

Marking technology



Electrical engraving machines

ORION® Spirit level

Levelling aid

Application:

facilitates drilling and screw-driving in hard-to-reach spots. suitable for all electric hand drills.

Execution:

- equipped with removable, robust and ergonomically shaped handle
- Mounted on spindle neck
- With depth stop



70056...

Ident. No.

030

Prod. Gr. 794



ARE YOU LOOKING FOR PRODUCTS
THAT MEET THE TOUGHEST DEMANDS?

WE HAVE WHAT IT TAKES.

For a complete range of products that meet the toughest demands, visit www.iconridge.com

ORION® ARKOGRAF electrical pen
 Engraving metal, steel and non-metal materials using oscillating electrode

Application:

No. 78010: For marking metal and steel with oscillating electrode.

No. 78025: For marking metal, steel and non-metallic materials with oscillating electrode.

Execution:

- Frequency 50-60 Hz
- Not suitable for anodised parts
- Suitable for thicker writing
- For 6 writing widths
- Operates with an oscillating electrode according to the electric arc short circuit principle

- Consisting of special transformer for 1-8 V secondary voltage, with on/off switch, indicator lamp, approx. 1 m connection cable with Schuko plug, writing pencil, 3 electrodes each for 1.2 x 25 mm and 1.5 x 25 mm, for steel and metals, baseplate and wooden box.
- Surface must be grease free, without rust, scale or other contamination!

Advantage:

- **No. 78025:** With intensity controller, branding pencil and 3 electrodes (hot loops)



Suitable for		Steel Metal	Steel Metal Nonferrous
Power input (W)		50	50
78010...	Ident. No.	010 ●	-
78025...	Ident. No.	-	010 ●

Prod. Gr. 794

2 2 4 2

