

DATA SHEET



**LATROBE SPECIALTY
STEEL COMPANY**

Latrobe, PA 15650-0031 USA

LESCALLOY[®] 16NCD13 VAC-ARC[®] PREMIUM CARBURIZING STEEL

Typical Composition	C	Mn	Si	Ni	Cr	Mo
	0.15	0.50	0.25	3.25	1.00	0.25

GENERAL CHARACTERISTICS

LESCALLOY 16NCD13 VAC-ARC is a premium quality, low alloy, carburizing case hardenable, vacuum arc remelted steel, which takes its name from the French industry designation. In the carburized condition, its high case hardness is combined with desirable impact and fracture toughness characteristics in the core. Additionally, superior cleanliness makes Lescalloy 16NCD13 VAC-ARC steel ideally suited for critical aerospace gear and actuator applications.

WORKABILITY

Forge in the temperature range of 2000-2100°F (1093-1149°C).

HEAT TREATMENT

Annealing:	Heat uniformly to 1540-1580°F (838-860°C) and furnace cool.
Normalizing:	Heat uniformly to 1650-1750°F (899-954°C) and air cool.
Carburizing:	Carburize at 1650-1700°F (899-954°C) and slow cool.
Hardening:	Harden at 1500-1530°F (816-832°C) and oil quench.
Tempering:	Heat to 275-375°F (135-190°C) and air cool.
Expected Core Hardness:	340-410 HBW
Typical Case Hardness:	60-62 HRC

BAR/BILLET HARDNESS

The normalized and softened (tempered) hardness is typically less than 241 HBW.

MICROCLEANLINESS STANDARDS

Lescalloy 16NCD13 VAC-ARC steel is produced by consumable electrode vacuum arc remelting and conforms to AMS 2300 magnetic particle cleanliness. The microcleanliness, when rated in accordance with ASTM E45, will satisfy the following worst field ratings.

	A	B	C	D
Thin	1.5	1.5	1.5	1.5
Heavy	1.0	1.0	1.0	1.0

LESCALLOY[®] 16NCD13 VAC-ARC[®]

CORE MECHANICAL PROPERTIES

TYPICAL LONGITUDINAL ROOM TEMPERATURE DATA

Temper		UTS		0.2% YS		Elong.	Charpy-U Impact	
°F	°C	ksi	MPa	ksi	MPa	% in 5D	Ft-lbs	Joules
350	177	200	1378	160	1103	13	30	40.7
925	496	160	1103	135	931	16	25	33.9
1150	621	120	827	105	724	23	70	94.9

JOMINY END QUENCH HARDENABILITY

(Actual Jominy Data)

Station (16 th)	Hardness HRC	Station (16 th)	Hardness HRC
1	42	16	33.5
2	41.5	18	33
4	41	20	32.5
6	40.5	24	31
8	40	28	29
10	37.5	32	29.5
12	36	40	28.5
14	34.5		

SPECIFICATIONS

The following specifications are offered for general reference and should not be considered a complete listing.

AMS 6263
DMD 180-20 (Snecma)

AVAILABILITY

Lescalloy 16NCD13 VAC-ARC steel is available as bar and billet from Latrobe Specialty Steel. Minor chemistry variants of this alloy are also available to satisfy customer requirements.



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