

DATA SHEET



LATROBE SPECIALTY
STEEL COMPANY

Latrobe, PA 15650-0031 USA

LESCALLOY[®] HY-180 VIM-VAR HIGH STRENGTH ALLOY STEEL

Typical Composition	C	Mn	Si	Ni	Cr	Mo	Co
	0.13	0.10	0.05	10.0	2.0	1.0	8.0

GENERAL CHARACTERISTICS

LESCALLOY HY-180 VIM-VAR steel is a high strength alloy steel with superior toughness. It is double vacuum melted (VIM-VAR...vacuum induction melted followed by vacuum arc remelting) to provide superior cleanliness and ingot homogeneity, and to enhance mechanical properties.

PHYSICAL PROPERTIES

Density: 0.28 lb/in³ (7.76 g/cm³)

Modulus of Elasticity: 27.6 x 10⁶ psi (190.3 GPa)

Critical Temperatures:

Ac₃: 1459°F (793°C) Ms: 621°F (327°C)

Ac₁: 1155°F (624°C) Mf: 331°F (166°C)

FORGING

Forge between 1900-2100°F (1038-1149°C) and air cool.

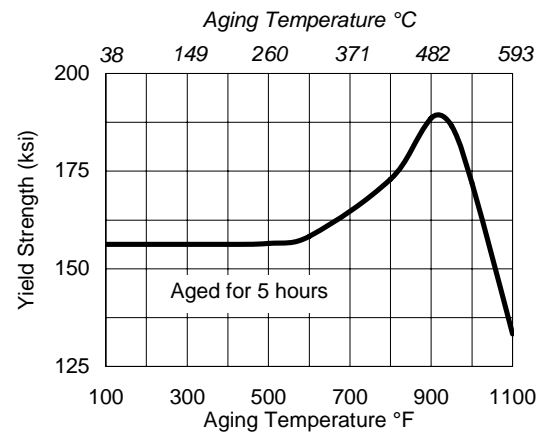
HEAT TREATMENT

Austenitize: Heat to 1525°F (829°C) for 1 hour per inch of thickness and water quench to RT.

Age: For maximum strength age at 900-950°F (482-510°C) for 5-10 hours and air cool to RT.

Anneal: Heat to 1150-1200°F (621-649°C) for 1 hour per inch of thickness and air cool to RT.

AGING CURVE



LESCALLOY[®] HY-180 VIM-VAR

MINIMUM MECHANICAL PROPERTIES OF FMS-1111 SPECIFICATION

Thickness	Tensile Strength		Yield Strength		Elongation %	R of A %	Impact Energy*	
	ksi	MPa	ksi	MPa			Ft-lbs	Joules
0.375 - 2.00	190	1310	180	1241	15	65	60	81
2.01 - 4.00	190	1310	175	1207	12	60	50	68
4.01 - 8.00	190	1310	170	1172	10	50	40	54

* Charpy V-Notch at 0°F (-18°C)

TYPICAL MECHANICAL PROPERTIES

Thickness	Tensile Strength		Yield Strength		Elongation %	R of A %	Impact Energy*	
	ksi	MPa	ksi	MPa			Ft-lbs	Joules
0.375 - 2.00	206	1420	186	1282	18	72	118	160
2.01 - 4.00	204	1407	182	1255	17	70	116	157

* Charpy V-Notch at 0°F (-18°C)

APPLICATIONS

Lescalloy HY-180 VIM-VAR steel is used in aerospace structural applications that demand a combination of high strength and superior toughness properties.

AVAILABILITY

Lescalloy HY-180 VIM-VAR steel is available as bar and billet from Latrobe Specialty Steel.

SPECIFICATIONS

The popular industry specification for this alloy is FMS-1111 (Lockheed/General Dynamics).



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