

# DATA SHEET



LATROBE SPECIALTY  
STEEL COMPANY

Latrobe, PA 15650-0031 USA

## LESCALLOY<sup>®</sup> 300M-HS VAC-ARC<sup>®</sup> HIGH STRENGTH ALLOY STEEL

Typical Composition	C	Mn	Si	Ni	Cr	Mo	V
	0.42	0.75	1.65	1.80	0.80	0.40	0.07

### GENERAL CHARACTERISTICS

LESCALLOY 300M-HS VAC-ARC steel is a modified 4340 steel with added silicon allowing for use of a higher tempering temperature. The steel has high hardenability and strength with good ductility and toughness in heavy sections, which make it suitable for aircraft landing gear, flap tracks, and other structural components. This variant has been developed for applications requiring 287 ksi (1979 MPa) minimum tensile strength through stringent control of chemistry and processing parameters. The enhanced properties of Lescalloy 300M-HS VAC-ARC permit the design of lighter aircraft components that exhibit equivalent load carrying capacities compared to standard 300M components. Vacuum arc remelting (VAR) is used to provide optimum cleanliness and preferred ingot structure.

### PHYSICAL PROPERTIES

Density: 0.283 lb/in<sup>3</sup> (7.84 g/cm<sup>3</sup>)

Thermal Conductivity: 260.0 Btu·in/hr·ft·°F (37.49 W/m·K)

Specific Heat: 0.107 Btu/lb·°F (448J/kg·K)

Mean Coefficient of Thermal Expansion 0-200°F (-17.8-93°C): 6.3x10<sup>-6</sup> in/in·°F (11.34x10<sup>-6</sup> mm/mm·°C)

### WORKABILITY

**Forging:** Forge at 1950-2250°F (1066-1232°C) using a minimum forging temperature of approximately 1700F (927°C).

**Weldability:** This steel can be welded by gas or arc fusion methods.

**Machinability:** For optimum machinability, Lescalloy 300M Vac-Arc steel should be normalized and tempered. Approximately 1200°F (649°C) is suggested for the temper. Hardness: Typically HBW 241-285.

### HEAT TREATMENT

**Normalize:** 1700°F (927°C), 1 hour, air cool

**Austenitize:** 1600°F (871°C), 1 hour, oil quench

**Temper:** 500-600°F (260-316°F), four hours, air cool

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## MECHANICAL PROPERTY DATA

### TYPICAL TRANSVERSE MECHANICAL PROPERTIES WITH 575°F (302°C) TEMPER

Size Tested		Specimen Size	U.T.S.		0.2% Y.S.		Elongation (%)	R of A (%)
in	mm		ksi	MPa	ksi	MPa		
26 - 28	660 - 711	0.252	292	2013	246	1696	10	31
≤12	≤305	0.252	298	2055	251	1731	11	34

## FRACTURE TOUGHNESS PER ASTM E 399

At nominal strength levels, the ASTM E 399 plane-strain fracture toughness is typically 60-70 ksi  $\sqrt{\text{in}}$ . (66-77 MPa  $\sqrt{\text{m}}$ ).

## JOMINY END QUENCH HARDENABILITY

	Distance from Quenched End (1/16 inch)									
	2	4	6	8	10	12	14	16	18	21
Rockwell C	59.0	58.5	58.5	58.0	58.0	57.5	57.5	57.5	57.5	57.5

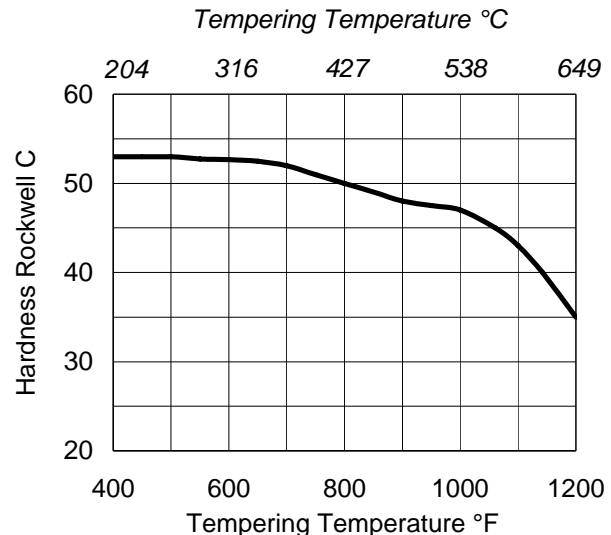
## SPECIFICATIONS

Lescalloy 300M-HS VAC-ARC meets the requirements of the specifications below. Contact your Latrobe Specialty Steel sales representative for inquiries regarding other specifications.

AMS 6419  
MTL-1201 (Messier-Dowty)  
LGMS 1000 (Goodrich)

## TEMPERING CURVE

Austenitized 1600°F (871°C), Oil Quench  
Tempered Twice 2+2 hours



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