

# DATA SHEET



**LATROBE SPECIALTY  
STEEL COMPANY**

Latrobe, PA 15650-0031 USA

## **LESCALLOY<sup>®</sup> 35NCD16 VAC-ARC<sup>®</sup>** HIGH STRENGTH ALLOY STEEL

Typical Composition	<b>C</b>	<b>Mn</b>	<b>Si</b>	<b>Ni</b>	<b>Cr</b>	<b>Mo</b>	<b>V</b>
	<b>0.40</b>	<b>0.45</b>	<b>0.30</b>	<b>4.00</b>	<b>1.80</b>	<b>0.45</b>	<b>0.03</b>

### **GENERAL CHARACTERISTICS**

LESCALLOY 35NCD16 VAC-ARC is a high strength, low alloy vacuum arc remelted steel that takes its name from the French industry designation. The combination of high strength, high fracture toughness and superior cleanliness available with Lescalloy 35NCD16 VAC-ARC steel readily identify it as a candidate for aerospace structural applications.

### **HEAT TREATMENT**

A typical heat treatment cycle for Lescalloy 35NCD16 VAC-ARC steel includes normalizing, austenitizing and tempering. Refrigeration can be added as an additional step following the air cool from the austenitizing temperature to assure complete transformation and realize maximum strength. Recommended temperatures and times would be as follows:

<b>Normalize:</b>	1700°F (927°C), 1 hour, air cool
<b>Austenitize:</b>	1600°F (871°C), 1 hour, air cool / sections over 4" should be oil quenched
<b>Refrigerate:</b>	(within 2 hours) -100°F (-73°C), 3 hours, air warm
<b>Temper:</b>	410°F (210°C), 3 hours, air cool
<b>Expected Hardness:</b>	52-54 HRC

### **BAR/BILLET HARDNESS**

The normalized and softened (tempered) hardness is typically 285-321 HBW.

### **MICROCLEANLINESS STANDARDS**

	<b>Typical Microscopic Cleanliness Requirements (J/K ASTM E45)</b>			
	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
Worst field, thin	1.5	1.5	1.5	2.0
Worst field, heavy	1.0	1.0	1.0	1.5

# LESCALLOY<sup>®</sup> 35NCD16 VAC-ARC<sup>®</sup>

## MECHANICAL PROPERTIES

### TYPICAL TRANSVERSE MID-RADIUS ROOM TEMPERATURE DATA\*

UTS		0.2%YS		Elong.	Elong.	R.A.	Impact	
ksi	MPa	ksi	MPa	(% in 4D)	(% in 5D)	(%)	Ft-lbs	(daJ/cm <sup>2</sup> )
285	1965	225	1550	10	8	40	16	4.3

\* From a 16 inch (406mm) cross section

### ROOM TEMPERATURE FRACTURE TOUGHNESS PER ASTM E399\*\*

Orientation	K <sub>IC</sub> ' ksi √in	K <sub>IC</sub> ' MPa √M	Orientation	K <sub>IC</sub> ' ksi √in	K <sub>IC</sub> ' MPa √M
T-L	83.56	91.83	L-T	82.73	90.92
T-L	83.78	92.07	L-T	85.13	93.56
T-L	83.63	91.91	L-T	80.94	88.95
T-L	81.74	89.83	L-T	82.22	90.36
T-L	83.31	91.54	L-T	85.44	93.89
T-L	80.42	88.37	L-T	82.93	91.13
T-L	89.64	98.50	L-T	87.83	96.51
T-L	91.67	100.73	L-T	86.36	94.90

\*\*Specimens prepared from mid-radius

## SPECIFICATIONS

The following list of popular industry specifications is a general reference. This should not be considered a complete listing.

MTL-1203 (Messier-Dowty)

GEN 41-06 (Messier-Bugatti)

## AVAILABILITY

Lescalloy 35NCD16 VAC-ARC steel is available as bar and billet from Latrobe Specialty Steel.



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Latrobe, Pennsylvania 15650-0031 U.S.A.  
Phone: (724) 537-7711 Fax: (724) 532-6316  
[www.latrobesteel.com](http://www.latrobesteel.com)