

DATA SHEET



LATROBE SPECIALTY
STEEL COMPANY

Latrobe, PA 15650-0031 USA

LESCALLOY[®] 9310 VAC-ARC[®] PREMIUM CARBURIZING STEEL

Typical Composition	C	Mn	Si	Ni	Cr	Mo
	0.10	0.50	0.25	3.25	1.20	0.12

GENERAL CHARACTERISTICS

LESCALLOY 9310 VAC-ARC steel is a premium quality alloy carburizing steel produced by the vacuum consumable electrode process. It has high hardenability, high core hardness and high fatigue strength, all of which make it ideally suited for critical aircraft engine gears.

WORKABILITY

Forge at 2000-2100°F (1093-1149°C)

MACHINABILITY RATING

In the annealed condition, 179-229 HBW, LESCALLOY 9310 VAC-ARC steel has machinability rating of 40% of B1112 steel.

FORMS AVAILABLE

Billets; hot rolled bars, cold drawn and centerless ground bars; forgings.

APPLICATIONS

Aircraft Engine Gears and Pinions

HEAT TREATMENT

Annealing: Heat uniformly to 1475-1575°F (802-857°C), furnace cool.

Normalizing: Heat uniformly to 1650-1750°F (899-954°C), air cool.

Carburizing and Hardening: Carburize at 1650-1700°F (899-927°C), slow cool. To harden oil quench from 1425-1555°F (774-846°C).

Temper: At 250-350°F (121-177°C).

Approximate Case Hardness: 60-62 HRC.

Approximate Core Hardness: 331-363 HBW

LESCALLOY® 9310 VAC-ARC®

MECHANICAL PROPERTY DATA

TYPICAL CORE PROPERTIES

Heat Treatment	Tensile Strength		Yield Strength		Elongation (% in 2")	R. of A. (%)	Core Hardness HBW
	ksi	MPa	ksi	MPa			
A	187	1289	162	1117	15	51	375
B	155	1069	130	896	15.5	52	331
C	175	1207	155	1069	16	53	363

A - Pseudo carburized at 1700°F (927°C) for 8 hours and oil quenched. Tempered at 300°F (149°C) for 2 hours.

B - Pseudo carburized at 1700°F (927°C) for 8 hours and slow cooled to room temperature. Heated to 1425°F (774°C) and oil quenched. Tempered at 300°F (149°C) for 2 hours.

C - Pseudo carburized at 1700°F (927°C) for 8 hours and slow cooled to room temperature. Heated to 1525°F (829°C) and oil quenched. Tempered at 300°F (149°C) for 2 hours.

AVERAGE JOMINY END QUENCH HARDENABILITY

	Distance from Quenched End (1/16 inch)											
	1	2	3	4	5	6	7	8	9	10	11	12
Rockwell C	39	39	39	39	39	38.5	38	37	36.5	36	35.5	35

CLEANLINESS REQUIREMENTS

LESCALLOY 9310 VAC-ARC steel conforms to AMS 2300 magnetic particle cleanliness. The microcleanliness, rated according to ASTM E-45, typically satisfies the following worst field ratings:

	A	B	C	D
Thin	2.0	1.5	1.5	1.5
Heavy	1.0	1.0	1.0	1.0

SPECIFICATIONS

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

AMS 6265	299-947-032 (Bell) (VAR)
AMS 6267	299-947-302 (Bell) (VIM-VAR)
MIL-S-7393	EMS 56279 (Honeywell)
MIL-S-83030	EMS 56280 (Honeywell)
BMS 7-249 (Boeing) (VIM-VAR)	SS 9705 (Sikorsky) (VIM-VAR)
HMS 6-1263 (Boeing-Mesa)	



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