

9310 ALLOY STEEL AMS 6265 VAR UNS 93106

9310 VAR AMS 6265 is a Chromium-Nickel-Molybdenum Alloy used as a Carburizing Grade for Aircraft Parts. Users can obtain high case hardness coupled with high core strength and toughness. High alloy content makes it suitable for use in relatively large cross-sections. Its combination of high alloy and low carbon content can achieve high core hardness with a narrow range between thicker and thinner part cross sections.

This alloy can be used in some applications without case-hardening, as it exhibits strength with excellent toughness and ductility. Carburizing offers a highly wear-resistant surface. Service Steel Aerospace stocks Premium Aircraft Quality produced double melted in an Electric Furnace, followed by a VAR, or Vacuum Arc Remelt (also known as CEVM). Standard air-melted Aircraft Quality AMS 6260 Air Melt material is available on request. 9310 VIM-VAR material is also available on request.

9310 VAR steel is typically used in the following applications:

- Aircraft engine gears & pinions
- Shafts
- Clutch Parts
- Boring bars
- Piston pins
- Aluminum rolling mill rolls

Common Trade Names:

- Lescalloy 9310 Vac-Arc
- European Designation 10NiCrMo13-5
- 9310 VAR
- AISI 9310
- SAE 9310

Common Specifications:

- AMS 6265 VAR (CEVM)
- AMS 6267 Type 2
- AMS 2300 Cleanliness
- AMS 6260 Air Melt Aircraft Quality (except VAR)
- BPS 299-947-032
- MIL-S-7393 Comp 3 (except VAR)
- EMS 56729
- EMS 56280

Chemical Composition:

Symbol	Element	Min %	Max %
C	Carbon	0.07%	0.13%
Mn	Manganese	0.40%	0.70%
Si	Silicon	0.15%	0.35%
P	Phosphorus		0.015%
S	Sulfur		0.015%
Cr	Chromium	1.00%	1.40%
Ni	Nickel	3.00%	3.50%
Mo	Molybdenum	0.08%	0.15%
B	Boron		0.001% (10 ppm)
Cu	Copper		0.035%

Hardenability Requirements:

Jominy: J 1/16 inch: 41 RC Hardness max

Jominy: J 6/16 inch: 32 RC Hardness max

For Material Normalized 1700° F (927° C) with Test Specimen Annealed 1500° F (816° C)

Heat Treatment:

Type	Process
Annealing	Heat throughout to 1475° - 1575° F, then furnace cool
Normalizing	Heat throughout to 1650° - 1750° F, then air cool
Carburizing & Hardening	Carburize at 1650° - 1700° F, slow cool. To harden, oil quench from 1425-1545 F
Temper	At 250° - 350° F
Approx Case Hardness	60 – 62 HRC
Approx Core Hardness	331 – 363 BHN

Typical Core Properties after Pseudo-Carburizing:					
Heat Treatment	Tensile Strength	Yield Strength	Elongation in 2"	Reduction of Area	Core Hardness
Pseudo Carburized 1700° F for 8 hours. Oil quenched, Tempered at 300° F for 2 hours	187 ksi	155 ksi	15%	51%	375 Bhn
Pseudo Carburized 1700° F for 8 hours. Slow cool to room temperature. Heat to 1425° F, oil quench. Tempered at 300° F for 2 hours	155 ksi	130 ksi	15.5%	52%	331 Bhn
Pseudo Carburized 1700° F for 8 hours. Slow cool to room temperature. Heat to 1525° F, oil quench. Tempered at 300° F for 2 hours	175 ksi	155 ksi	16%	53%	363 Bhn

Pseudo Carburized: Heat Treat with same process as for Carburizing, but without the presence of Carburizing Gas Furnace Atmosphere.