

4340 ALLOY STEEL – AMS 6414 VAR – UNSG43406

4340 VAR AMS 6414 is a low alloy Chromium-Nickel-Molybdenum steel capable of being heat treated to high strength levels.

This specification is for a premium aircraft-quality, low-alloy steel in the form of bars, forgings, mechanical tubing, and forging stock. Service Steel Aerospace stocks Premium Aircraft Quality produced double melted in an Electric Furnace, followed by VAR, or Vacuum Arc Remelt (also known as CEVM, or Consumable Electrode Vacuum Arc Remelting). This results in a much cleaner steel meeting the magnetic particle test requirements of AMS-2300.

It is a steel of the highest quality with excellent transverse ductility and toughness at high strength levels. It has good shock and impact resistance as well as wear and abrasion resistance in the hardened condition. Standard Aircraft Quality air-melted AMS 6414 Air Melt material is available on request. 4340 ESR, or Electroslag Remelted material is also available on request.

4340 alloy steel applications:

4340 has been used typically for parts requiring a through-hardening capability up to 3.5 inches (89 mm) in nominal thickness at time of heat treatment and subject to rigid magnetic particle inspection standards, but usage is not limited to such applications. Premium Aircraft Quality is intended for use in the manufacturing of highly stressed parts at higher strength levels, such as 260/280,000 psi and where a much cleaner steel is desired.

Chemical Composition:

Symbol	Element	Min %	Max %
C	Carbon	0.38%	0.43%
Mn	Manganese	0.65%	0.90%
Si	Silicon	0.15%	0.35%
P	Phosphorus		0.01%
S	Sulfur		0.01%
Cr	Chromium	0.70%	0.90%
Ni	Nickel	1.65%	2.00%
Mo	Molybdenum	0.20%	0.30%

Cu	Copper	0.35%
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Mechanical Properties:

Bar Size	Temperature *	Tensile Strength	Yield Strength	Elongation in 2"	Reduction of Area
3.5" Dia.	400° F (204° C)	276 ksi	222 ksi	11.0%	35.0%
7.5" Dia.	500° F (260° C)	265 ksi	222 ksi	8%	25.0%
10.5" Dia.	1100° F (593° C)	165 ksi	150 ksi	18%	60.0%

* After Normalized 1650°/1700° F, Austenized 1500°/1525° F, Oil quenched

Common Trade Names:

- Lescalloy 4340 Vac-Arc
- European Designation 36CrNiMo4
- 4340 Chrome-Nickel-Molybdenum Steel
- SAE 4340
- AISI 4340
- 4340 CEVM
- 4340 ESR

4340 VAR AMS 6414 Common Specifications:

- AMS 6414 VAR (CEVM)
- AMS 6414 ESR
- AMS 6415 (Air Melt)
- AMS 6409
- MIL-S-5000, AMS-S-5000 (Both are cancelled and superseded by AMS 6415)
- MIL-S-8844
- 299-947-055 Bell Helicopter
- SS 9702 Sikorsky
- DMS 1555 Boeing (Previously McDonnell Douglas)
- HMS 6-1121 (for 4340 ESR Only)
- BPS 4807 (for 4340 ESR Only)