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300M (4340 MOD) Alloy Steel - AMS 6417 - UNS K44220

300M Consumable Electrode Vacuum Remelted Steel is 4340 Alloy Steel modified with the addition of Vanadium and higher Silicon. Carbon Content in AMS 6417 Carbon content is 0.37% to 0.43”. Specifications AMS 6419 requires 0.40” – 0.45% C and AMS 6256 0.40% - 0.44%C. Service Steel Aerospace stocks material with restricted carbon content to certify chemistry to these various specifications.

These chemistry modifications provide an Alloy Steel with very good fatigue strength, ductility, impact strength and fracture toughness. 300M is widely used for Aircraft Landing Gear.

300M (4340 Mod) Alloy Steel Applications:

This grade is used high strength structural applications with sections 3.5” in and under in cross-section thickness for through-hardness requiring minimum Rockwell C hardness 52 HRC that are subject to exacting magnetic particle inspection standards. Applications include:

- Aircraft Landing Gear
- Airframe Parts, such as Flap Tracks
- Missile Components
- Motorsport Applications

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Common Trade Names:

- Lescalloy 300M Vac-Arc
- 4340 Modified
- 434M
- 300M CEVM

Common Specifications:

- AMS 6417 (Replaces MIL-S-83135)
- AMS 6419
- AMS 6257 (Replaces MIL-S-8844 REV D CLASS 3)
- AMS 2300 Premium Aircraft Quality Cleanliness
- BMS 7-26
- BE1036
- CE-0896
- C-05-1190
- DMS 1935
- GM1012
- MTL 1201
- S155
- MAT 137
- SAE 434M
- IGQ 41-11
- LAT 1.9042
- ZFNL 9207
- ASTM A646

Physical Properties:

- Density: 0.2836 #/in^3

Stocked Sizes:

Note: Stocked as Normalized & Tempered (N&T)

- Rounds: Rough Turned (RT) N&T:
  - 40 Diameters 0.500" through 11"
- Blocks (Bars): Forged, Machined 4 sides N&T
  - Stocked sizes
    - 8" x 12" and 12" x 23"
    - Custom thicknesses & widths available saw-cut

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Chemical Composition:

Symbol	Element	Min %	Max %
C	Carbon	0.38%	0.43%
Mn	Manganese	0.65%%	0.90%
Si	Silicon	1.45%	1.80%
P	Phosphorus		0.010%
S	Sulfur		0.008%
Cr	Chromium	0.70%	0.95%
Ni	Nickel	1.65%	2.00%
Mo	Molybdenum	0.30%	0.50%
V	Vanadium	0.05%	0.10%
Cu	Copper		0.35%

Carbon Content Note:

Both AMS 6257 and AMS 6419 require minimum 0.40% Carbon content
SSA material is stocked with minimum 0.40% Carbon content to meet multiple specifications

AMS 6417 Macrostructure standards:

Class	Condition	Severity
1	Freckles	A
2	White Spots	A
3	Radial Segregation	B
4	Ring Pattern	B

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Minimum Longitudinal Tensile Properties per AMS 6417:

Property	Value
Tensile Strength	270 ksi
Yield Strength 0.2% offset	220 ksi
Elongation	8%
Reduction of Area	30%

After heat treating specimens per paragraph 3.4.4

Minimum Transverse Tensile Properties per AMS 6417:

Cross-section Area	Tensile Strength	Yield Strength 0.2% Offset	Avg. Reduction of Area	Individual Reduction of Area
Up to 100 in^2, incl	270 ksi	220 ksi	30%	25% min
Over 100 in^2 to 144 in^2, incl	270 ksi	220 ksi	25%	20% min
Over 144 in^2 to 225 in^2, incl	270 ksi	220 ksi	20%	15% min
Over 225 in^2	270 ksi	220 ksi	15%	10% min

AMS 6417 Heat Treatment

Type of Heat Treating	Process
Normalize	1700° F +/- 25° F (927° C +/- 14° C), then air cool
Harden	1600° F +/- 25° F (871° C +/- 14°C), quench in oil
Temper	Double temper 400° – 1200° F (204° – 649° C) depending on desired strength and hardness.