



## 410 Stainless Steel Bar

### UNS S41000

## AMS 5613

### Nominal Composition

Iron 85% Chromium 12% Carbon 0.14%

### Description

A 12 percent chromium martensitic stainless steel suitable for general purpose applications that is corrosion resistant to fresh water and mild acids and alkalis. Type 410 is suitable for applications not demanding high corrosion resistance and can be used up to 1200°F (649°C) where resistance to scaling and oxidation is required. Type 410 is used for pumps and oil refinery equipment, nuclear and airframe applications, and vanes and blades in jet engine compressors.

### Properties

Magnetic. Type 410 possesses resistance to atmospheric corrosion because it forms a tightly adherent oxide film which protects the surface from attack. The maximum corrosion resistance is obtained by hardening and polishing to a smooth surface finish. Type 410 resists oxidation up to 1500°F (816°C) but for continuous service the temperature should not exceed 1200°F (649°C). A wide range of properties may be obtained by hardening and tempering this stainless steel.

### Hardness

Hardness of Aerodyne stock is typically 155 BHN. Supplied in the annealed condition. In the annealed condition, Type 410 consists of ferrite and carbides. After quenching from the austenitizing heat treatment, the microstructure consists of martensite and carbides. Hardening is accomplished by austenitizing at 1750-1850°F (945-1010°C) followed by water or oil quench, immediately followed by tempering between 400°F (204°C) and 1400°F (760°C). 410 can be hardened and tempered to 223-400 BHN using an appropriate heat treatment. Higher tempering temperatures are preferred to maximize toughness, though strengths are lower. Tempering between 750°F (399°C) and 1050°F (566°C) should be avoided if possible since it results in decreased impact strength due to precipitation of alpha prime.

### Machinability

RATING: 80% of B-1112

TYPICAL STOCK REMOVAL RATE: 100 surface feet/minute with high speed tools.

COMMENTS:

Not as difficult to machine as austenitic alloys because of lower rate of cold work hardening. Although annealed condition provides optimum machinability, must be hardened and tempered to develop desired strength and hardness.

**Density:** 0.278 lbs/in<sup>3</sup>, 7.69 g/cm<sup>3</sup>

### Standard Inventory Specifications

- AMS 5613
- Also meets AMS 5612 (low ferrite)
- ASTM-A 276
- ASTM-A 479
- QQS 763
- Line marked over 0.5 inch in diameter
- Predominantly produced by AOD process. Annealed, centerless ground or rough turned.
- Lengths: 10-12 feet

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