

Alloy X Plate

UNS N06002

0.297 lbs/in³, 8.22 g/cm³

AMS 5536



O'Neal High-Performance Metals Group

Nominal Composition

Nickel 50% Chromium 21% Iron 18% Molybdenum 9%

Description

Alloy X is a high temperature and corrosion resistant nickel-base solid solution strengthened alloy. This alloy has outstanding resistance to oxidation at high temperatures and possesses exceptional strength at elevated temperatures. Alloy X exhibits good formability, weldability, and machinability.

Properties

Non-magnetic. Alloy X has high strength up to 1500°F (816°C) and good oxidation resistance up to 2200°F (1204°C). This alloy is especially resistant to carburization and nitriding, conditions which cause failure in some high temperature alloys. Alloy X is used extensively in high temperature jet engine and chemical processing applications and is highly resistant to stress corrosion cracking in petrochemical applications.

Hardness

Hardness of Aerodyne stock is typically 200. The material is usually used in the solution treated (annealed) condition. Grain structure is austenitic at both cryogenic and elevated temperatures.

Machinability

RATING: 27% of B-1112

TYPICAL STOCK REMOVAL RATE: 45 surface feet/minute with high speed tools. 125 surface feet/minute with carbide.

COMMENTS:

Care must be taken to ensure a rigid machine setup and sharp tools, so that work hardening and surface glazing do not occur.

Weldability

Alloy X has excellent welding characteristics and can be welded by most customary techniques, such as inert gas tungsten arc (TIG), gas metal arc welding (GMAW), and resistance welding. Oxyacetylene and submerged arc processes are not recommended, especially when the metal is intended for use in corrosive service. Avoid excessive heat input when welding and it is usually not necessary to solution anneal the alloy after welding. The material resists the formation of grain boundary precipitates in the heat-affected zone of the weld, so the fabrication is suitable for most chemical processes in the as-welded condition.

Density: 0.297 lbs/in³, 8.22 g/cm³

Standard Inventory Specifications

- AMS 5536
- ASTM B 435
- Predominantly produced by AOD-ESR melt method. Hot worked, solution treated (annealed), then descaled.