



17-4 PH Bar UNS S17400

AMS 5643

Nominal Composition

Iron 72% Chromium 16% Nickel 4% Copper 4%
Columbium + Tantalum 0.30%

Description

Type 17-4 PH is a martensitic, chromium-nickel-copper precipitation hardening stainless steel used for applications requiring high strength and a moderate level of corrosion resistance. High strength is maintained to approximately 600°F (316°C). Typical applications include aircraft structural parts, fasteners, pump shafts, valve parts, chemical process equipment and nuclear components.

Properties

Type 17-4 PH is capable of attaining a wide range of strength and toughness properties depending on the precipitation or aging temperature used in hardening. The corrosion resistance of Type 17-4 PH is similar to Type 304 stainless steel and is superior to that of the 400 series martensitic stainless steels. Type 17-4PH has good resistance to stress corrosion cracking in the lower strength conditions. Material in the annealed condition should not generally be put into service, as the microstructure consists of untempered martensite and may be subject to unpredictable brittle failures. The oxidation resistance of Type 17-4PH is superior to that of 12 percent chromium stainless steels but slightly inferior to that of Type 430 .

Hardness

Hardness of Aerodyne stock is typically 340 BHN. Supplied in the solution treated condition, 1900°F (1038°C). Type 17-4PH can be hardened to approximately 293-420 BHN after aging. Hardening is accomplished by a low temperature treatment which precipitates a copper containing phase in the alloy. The precipitation aging treatment range is 900-1150°F (482-621°C), with virtually no scaling or distortion. Maximum strength is attained after aging at 900°F (482°C), while maximum toughness, with lower strength, is attained after aging at 1150°F (621°C).

Machinability

RATING: 80% of B-1112
TYPICAL STOCK REMOVAL RATE: 120 surface feet/minute in the solution treated or over-aged condition (1150°F aging).
COMMENTS:

Machinability similar to standard 304 stainless steel. Rigid set-up with plenty of power required. Machinability decreases with increasing aged hardness to a minimum of 20 surface feet per minute after aging at 900°F (482°C) to attain maximum hardness.

Density: 0.282 lbs/in³, 7.81 g/cm³

Standard Inventory Specifications

- AMS 5643
- ASTM-A 564
- HS 279
- QQS 763
- Line marked over 0.5 inches in diameter
- Predominantly produced by AOD method. Solution treated, centerless ground or rough turned.
- Lengths: 10-12 feet

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