



Technical Data

Ferguson Metals, Inc. ♦ Hamilton, Ohio

Precipitation-Hardening

Stainless Steel

Type 17-4PH (S17400)

GENERAL PROPERTIES

Type 17-4PH stainless steel is the most widely used of all the precipitation-hardening stainless steels. Its valuable combination of properties gives designers opportunities to add reliability to their products while simplifying fabrication and often reducing costs. This valuable alloy is widely used in the aerospace, chemical, petrochemical, food processing, paper and general metalworking industries.

Type 17-4PH is a martensitic precipitation-hardening stainless steel that provides an outstanding combination of high strength, good corrosion resistance, good mechanical properties at temperatures up to 600°F (316°C), good toughness in both base metal and welds, and short-time, low temperature heat treatments that minimize warpage and scaling.

Type 17-4PH is available in sheet, strip, plate, bar, wire and castings, complete welded assemblies involving components of these various forms are possible. Its unique combination of properties make this alloy an effective solution to many design and production problems.

CHEMICAL COMPOSITION

Element	Percent by Weight Type 17-4PH
Carbon	0.07 maximum
Manganese	1.00 maximum
Phosphorous	0.04 maximum
Sulfur	0.03 maximum
Silicon	1.00 maximum
Chromium	15.00-17.50
Nickel	3.00-5.00
Copper	3.00-5.00
Columbium plus Tantalum	0.15-0.45

RESISTANCE TO CORROSION

Type 17-4PH stainless steel has excellent resistance. It withstands corrosive attack better than any of the standard hardenable stainless steels and is comparable to Type 304 in most media.

This has been tested in a wide variety of corrosive conditions in the petrochemical, petroleum, paper, dairy and food processing industries, and in applications such as boat shafting. Additional proof of its durability is the replacement of chromium-nickel stainless steels and high-alloy non-ferrous metals by Type 17-4PH stainless steel for a broad range of parts requiring excellent resistance to corrosion.

PHYSICAL PROPERTIES (H 900 Condition)

Melting Range 2560-2625°F (1404-1440°C)
Density 0.280 lb/in³

MEAN COEFFICIENT OF THERMAL EXPANSION (Annealed Cond)

Temperature Range		Mean Coefficient of Thermal Expansion	
°C	°F	µm/m·°C	in/in/°F×10 ⁶
21-93	70-200	10.8	6.0
21-204	70-400	10.8	6.0
21-316	70-600	11.2	6.2
21-427	70-800	11.3	6.3

THERMAL CONDUCTIVITY (H 900 Condition)

Temperature Range		Btu/ (hr/ft ² /in/°F)	
°C	°F	W/m · K	
149	300	17.9	124
260	500	19.5	135
460	860	22.5	156
482	900	22.6	157

SPECIFIC HEAT (Annealed Condition)

Temperature Range		J/kg·K	
°C	°F		Btu/lb·°F
0-100	32-212	460	0.11

ELECTRICAL RESISTIVITY (Annealed Condition)

Microhm-cm
98

MECHANICAL PROPERTIES

Type 17-4PH stainless steel has excellent mechanical properties. For applications requiring high strength and hardness as well as corrosion resistance, Type 17-4PH stainless is an outstanding choice, and it is more cost effective than many high nickel non-ferrous alloys.

The strength of Type 17-4PH sheets and strip closely matches that of bar and wire. However, ductility is somewhat lower.

TYPICAL MECHANICAL PROPERTIES OF SHEETS AND STRIP - COLD FLATTENED (Annealed)

UTS (Tensile) Ksi(MPa)	0.2% Yield Strength Ksi(MPa)	Elongation % in 2" (51mm)	Hardness Rockwell C
160 (1103)	145 (1000)	5.0	35

Data shown are typical, and should not be construed as maximum or minimum values for specification or for final design. Data on any particular piece of material may vary from those shown herein.