

Description

Stainless Steel Grade **630/1.4542**, also known as AISI 630 or 17-4PH, is a precipitation-hardening martensitic stainless steel. It is characterized by its high strength, excellent corrosion resistance, and good mechanical properties, making it suitable for various demanding applications.

Chemical Composition

The standard chemical composition of Grade 630 is as follows:

Element	Percentage (%)
Carbon (C)	0.00 - 0.07
Manganese (Mn)	0.00 - 1.00
Phosphorus (P)	0.00 - 0.04
Sulfur (S)	0.00 - 0.03
Silicon (Si)	0.00 - 1.00
Chromium (Cr)	15.00 - 17.50

Nickel (Ni)	3.00 - 5.00
Copper (Cu)	3.00 - 5.00
Niobium (Nb)	0.15 - 0.45

Mechanical Properties

The mechanical properties of Grade 630 vary based on the heat treatment condition:

Condition	Tensile Strength (MPa)	Yield Strength (MPa)	Elongation (%)	Hardness (Rockwell C)
Solution Treated	1105 (typical)	1000 (typical)	15 (typical)	38 max
Condition H900	1310 (min)	1170 (min)	10 (min)	40 min
Condition H1150	930 (min)	724 (min)	16 (min)	28 min

Thermal & Physical Properties

- Density: 7.75 g/cm³
- Thermal Expansion: 10.8 x 10⁻⁶ /°C

- Modulus of Elasticity: 196 GPa
- Thermal Conductivity: 18.4 W/m·K
- Electrical Resistivity: $0.8 \times 10^{-6} \Omega \cdot m$

Other Designations

- DIN Number: 1.4542
- Other Names: 17-4PH, UNS S17400

Fabrication and Heat Treatment

- Heat Treatment:
 - Solution Treatment: Heat to 1040°C for 0.5 hours, then air cool.
 - Aging: Age-hardened at low temperatures to achieve desired mechanical properties.
- Welding: Can be welded using conventional methods without pre-heating. Post-weld heat treatment can be performed to restore mechanical properties.
- Machining: Machinability is similar to that of grade 304 stainless steels in the solution-treated condition.

Applications

Grade **630/1.4542** is widely used in various industries, including:

- Aerospace
- Marine
- Paper and pulp
- Energy
- Food processing

Typical applications include:

- Heavy-duty machine components
- Bushings
- Turbine blades
- Couplings
- Drive shafts
- Nuts and screws

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STAINLESS STEEL WIRES & BARS

Supplied Form

Stainless Steel Grade **630/1.4542** is commonly supplied in various forms, including:

- Round bars
- Sheets
- Flat bars
- Cold-rolled strips

Features

- High strength and hardness
- Excellent corrosion resistance comparable to 304 stainless steel
- Good ductility in heat-treated conditions

This datasheet provides a comprehensive overview of Stainless Steel Grade 630, highlighting its properties, applications, and fabrication methods.

