



## Alloy 17-4PH

### Quick Facts

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Alloy 17-4PH or UNS S17400 or type 630, is a chromium-nickel-copper precipitation-hardening martensitic Stainless Steel with an addition of niobium. 17-4PH is normally supplied in annealed condition, that is Condition A. This Alloy combines high strength with good corrosion resistance. Optimal mechanical properties can be obtained by age hardening heat treatments. 17-4PH can be easily welded and processed machining practices. The Alloy is magnetic.

### Typical Applications

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- Aerospace, structural parts,
- Biomedical applications
- Chemical processing
- Food process equipment
- Oil & Gas applications
- General high strength applications
- Nuclear Waste processing and storage

### Stock Range

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We stock a comprehensive range of round bars (various condition), sizes between 14mm and 280mm in diameter

Flat Bars with a thickness between 8mm – 118mm and a width with max. 250mm.

We are offering as well:

General forgings

Rings

Blocks

Primarily manufactured in: Europe, US

Primarily manufactured in: Europe, US



## Industry Specifications

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- EN/DIN 1.4542/ X5CrNiCuNb16.4/ AFNOR Z6CNU17-04/ ASME SA 693
- ASTM-A564/ Grade 630/ UNS S17400/ JIS SUS630
- AMS 5643/5604 / EN10088-3 H900/H1025/ H1075/ H1150D
- Material may also be supplied against Customer specifications, subject to enquiry.

## Chemical Analysis

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Alloy 718 is hardened by the precipitation of secondary nickel- (aluminium, titanium, niobium) phases giving the alloy a combination of high strength and good corrosion resistance.

### Chemical Composition, %

	C	P	S	Si	Cr	Ni	Mn	Cu	Nb+Ta	Fe
Min	-	-	-	-	15.00	3.00	-	3.00	0.15	Bal.
Max	0.07	0.04	0.03	1.00	17.50	5.00	1.00	5.00	0.45	Bal.



## Mechanical Properties

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Condition	0.2% Offset, Yield Strength (ksi)	Tensile Strength (ksi)	Elongation in 2 in. (%)	Reduction of Area (%)	Hardness (HRC)	Charpy V-Notch Impact Strength (ft-lb)
H900	198	183	15	52	44	16
H1025	168	162	16	58	38	40
H1075	164	148	17	59	36	45
H1150	144	126	20	60	33	55
H1150M	123	87	22	66	29	100
H1150D	150	110	20	60	29	50

## Machinability

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17-4PH can be machined in both conditions; means in solution annealed and aged conditions. Machining characteristics may vary according to the hardness. Hi speed tools are accepted, but carbide tools are preferred. Standard coolant should be used. Dimensional changes as a result of the heat treatment should be taken into account, if very stringent tolerances are required.

## Heat Treatment

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17-4PH normally will be supplied in solution annealed condition. Mechanical properties may be achieved by subsequent age hardening treatments. These aging treatments are referred to H900, H1025, H1075, H1150, H1150M and H1150D, as mentioned above. The process are outlined in the next table below. The achievable mechanical properties are shown in the above table.



Condition	Temperature deg.F	Time, h	quench
H900	900	4	Air cool
H1025	1025	4	Air cool
H1075	1075	4	Air cool
H1150	1150	4	Air cool
H1150D	1400 for 2h, air cool plus 1150 for 4 h, air cool		

## Corrosion Resistance

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The corrosion resistance of Alloy 17-4PH is comparable with AISI 304 stainless steel, but is in general superior to 400 series stainless steel. It is used in applications where the combination of moderate corrosion resistance and unusual high strength are required. Alloy 17-4PH in condition A, should not generally be put into service, the Alloy is subject to brittle fractures and more sensitive to chloride stress corrosion cracking than the aged Alloy.