Duplex Stainless Steel

Alloy 17-4PH

Description

17-4PH is martensitic precipitation hardening stainless steel. It was originally developed to combine high tensile strength and moderate corrosion resistance after simple aging heat treatment, addressing the gap between low-strength carbon steel and brittle quenched martensitic stainless for structural components.

Traditional martensitic stainless steels required complex quenching and exhibited poor toughness after hardening. It maintains mechanical properties under high static and fatigue loads at temperatures up to around 300°C, making it ideal for valve trim, pump shafts, oilfield tooling and general high-strength fasteners.

Grade: UNS S17400， Type 630, 17Cr-4Ni-4Cu

Chemical Composition (wt%)

C	Cr	Cu	Nb+Ta	Mn	Si	P	S	Ni
≤0.07	15.00–17.50	3.00–5.00	0.15–0.45	≤1.00	≤1.00	≤0.040	≤0.030	3.00-5.00

Disclaimer: Data is typical for reference only.

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Technical standards

Technical Standards	Product Form
ASTM A564 / A564M	Bars and Shapes
ASTM A693	Plate, Sheet, Strip
AMS 5604	Plate, Sheet, Strip
AMS 5622	Bar, Wire, Forging, Mechanical Tubing and Rings

Physical Properties

Room-Temperature Constant Parameters

Item	Typical Value
Density	7.75 g/cm³
Poisson's ratio	0.27
Magnetic property	Magnetic
PREN	16

Coefficient of thermal expansion

θ/°C	α/10⁻⁶ /°C
20–200	10.6
20–400	11
20–500	11.3
20–600	11.6

Modulus of Elasticity

θ/°C	E/GPa
25	196
200	187
425	176
540	168

Shear Modulus

θ/°C	G/GPa
25	75.0
200	71.8
425	67.8
540	64.2

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Mechanical Properties (Precipitation Hardened, Room Temperature)

Item	H900 (480°C)	H1025 (550°C)	H1150 (620°C)
Tensile Strength, min	1310 MPa	1070 MPa	965 MPa
0.2% Yield Strength, min	1170 MPa	1000 MPa	795 MPa
Elongation (50mm), min	10%	12%	16%
Hardness	40–47 HRC	33–38 HRC	28–34 HRC