

17-4 PH Stainless (Type 630, UNS S17400) — Material Data Sheet

ASTM A1082 bolting · ASTM A564 bar · UNS S17400 · Type 630 (17-4 PH®)

Martensitic precipitation-hardening stainless steel, solution treated and age hardened

The high-strength stainless — up to 190 ksi in H900, or 115 to 135 ksi with real toughness in the H1150 conditions — for pump shafts, valve stems, subsea and aerospace fasteners.

TENSILE, H900	190 ksi min	SOLUTION TREATMENT	1900 °F, cool below 90 °F
TENSILE, H1150	135 ksi min	CHARPY, H1150M	55 ft·lbf min
HARDNESS, H900 / H1150	40 / 28 HRC min	MAGNETIC	Yes

Nominal composition



Midpoints of the specification ranges, for orientation only. Limits are in the table.

Chemical composition — 17-4 PH (S17400) per ASTM A1082 Table 1

Element	Symbol	Min %	Max %
Carbon	C	—	0.07
Manganese	Mn	—	1.00
Phosphorus	P	—	0.040
Sulfur	S	—	0.030
Silicon	Si	—	1.00
Chromium	Cr	15.0	17.0
Nickel	Ni	3.0	5.0
Copper	Cu	3.0	5.0
Niobium + tantalum	Nb+Ta	0.15	0.45

Values per ASTM A1082/A1082M-16(2021) Table 1 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team. ASTM A564 bar allows chromium 15.00–17.50.

Physical properties (typical)

DENSITY	0.282 lb/in ³ (7.80 g/cm ³)
MODULUS OF ELASTICITY	28.5 × 10 ⁶ psi (197 GPa)
MAGNETIC	Yes (martensitic)

Heat treatment

Solution treated at 1900 °F and cooled below 90 °F, then age hardened to the ordered condition (H900 through H1150M). Ageing is performed after machining and threading; the condition and cycle are recorded on the certificate.

Mechanical properties by condition — 17-4 PH bolting per ASTM A1082 Table 3

Condition	Aging treatment	Tensile strength, min (ksi)	Yield strength, min (ksi)	Elongation, min (%)	Reduction of area, min (%)	Hardness, min	Charpy V-notch, min (ft-lbf)
H900	900 °F, 1 h	190	170	10	35	40 HRC / 388 HBW	—
H925	925 °F, 4 h	170	155	10	38	38 HRC / 375 HBW	5
H1025	1025 °F, 4 h	155	145	12	45	35 HRC / 331 HBW	15
H1075	1075 °F, 4 h	145	125	13	45	32 HRC / 311 HBW	20
H1100	1100 °F, 4 h	140	115	14	45	31 HRC / 302 HBW	25
H1150	1150 °F, 4 h	135	105	16	50	28 HRC / 277 HBW	30
H1150D	1150 °F, 4 h, air cool, then 1150 °F, 4 h	125	105	16	50	24–33 HRC / 255–311 HBW	30
H1150M	1400 °F, 2 h, air cool, then 1150 °F, 4 h	115	75	18	55	24 HRC / 255 HBW	55

Values per ASTM A1082/A1082M-16(2021) Table 3 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team. Aging temperatures ± 25 °F; times are minimums at temperature; air or gas cool. Applies to 8 in. thickness and under.

Solution-treated condition — 17-4 PH per ASTM A1082 Table 2

Condition	Solution treatment	Hardness, max
A (solution treated)	1900 $\pm$ 25 °F (1040 °C), cool to below 90 °F	38 HRC / 363 HBW

Values per ASTM A1082/A1082M-16(2021) Table 2 (verified against the specification). Confirm the edition called out on your purchase order with our estimating team.

Applicable standards

ASTM A1082 / A1082M	High strength precipitation hardening and duplex stainless steel bolting
ASTM A564 / A564M	Hot-rolled and cold-finished age-hardening stainless bar (Type 630)
AMS 5643 / AMS 5622	Aerospace 17-4 PH bar and forgings
NACE MR0175 / ISO 15156	17-4 PH is listed for sour service in the double-aged conditions within hardness limits

Forms we supply in 17-4 PH

- Studs, hex bolts and cap screws in any A1082 condition
- Socket head cap and shoulder screws
- Hex nuts (proof tested to S5 on request)
- Pump, valve and instrument components machined to print
- Certified A564 bar, solution treated or aged

Typical applications

- Pump shafts, impellers and wear rings
- Valve stems, seats and bonnet bolting
- Subsea and wellhead components (H1150D / H1150M for NACE)
- Aerospace and defence fasteners
- Chemical and food process equipment needing strength and corrosion resistance