



Long Products Stainless Steel Grade Sheet

AISI 630
UNS S17400
EN 1.4542

INTRODUCTION

Type 630 is commonly referred to as 17-4 and is a precipitation-hardening martensitic stainless steel supplied in Hot Rolled and Cold Finished condition. It contains 17% chromium and 4% nickel, which makes it superior in corrosion resistance to the regular chromium-type martensitic stainless steels. An addition of copper is made to promote its precipitation hardening capability. This can be precipitation hardened by only holding the steel at 900°F for one hour, thereby minimizing scaling and distortion and allowing parts to be machined to close tolerances, prior to heat treatment. Type 630 is magnetic in both the solution annealed and precipitation hardened condition.

Type 630 is used for parts requiring corrosion resistance and high strength at room temperature or at temperatures up to 600°F. It is suitable for machining in the solution-annealed condition. After which, it can be age hardened to the specified mechanical properties, without danger of cracking or distortion.

PROUDCTS AVAILABLE

[Round Bars](#). See product sheet for dimensions, tolerances, finishes available and other details.

Standard Chemical Composition

Elements			C	MN	P	S	SI	CR	NI	Cu	Cb+Ta
UNS S17400	630	Min						15.00	3.00	3.00	0.15
		Max	0.07	1.00	0.040	0.030	1.00	17.50	5.00	5.00	0.45

Minimum Mechanical Properties

Condition	Tensile Strength ksi[MPa]	Yield Strength ksi[MPa]	% Elongation 4d	% Reduction in Area	Hardness
Heat Treated to H900	190	170	10	40	Rc 40

HEAT TREATMENT

SOLUTION ANNEALING: Heat to 1900°F +/- 25°F. Hold for ½ hour after center is at temperature. Air cool or oil quench to 90°F or lower.

It is NOT recommended that type 630 be put into service in this condition (Condition A) due to low ductility and corrosion resistance.

HARDENING: There are several heat treatments which are coded as H900, H925, H1025, H1075, H1100 and H1150. The number represents the heat treatment temperature employed. As this temperature increases, the developed strength declines but ductility improves. When parts are heat treated from Condition A to H900, a dimensional contraction of 0.0004"/0.006" per inch occurs. This contraction should be compensated during machining.

CORROSION RESISTANCE: The corrosion resistance of type 630 is superior to that of any standard martensitic hardenable stainless steels. In most applications and media, it is equivalent to type 304 stainless steel.

COLD WORKING: Because of its high strength in all conditions, it has limited cold workability. When fabrication requires cold forming prior to age hardening, the material is normally supplied in over-aged condition or in H1150M.

HOT WORKING: Type 630 should be heated uniformly to 2150°F–2200°F. If heating is required, forging should be thoroughly soaked at temperature before rework. Immediately after forging, the part should be returned to a heating furnace operating between 1900°F and forging temperature to equalize temperature prior to cooling.

Non-uniformity in temperature of the section may promote cracking on cooling.

MACHINABILITY: Type 630 can be machined in the solution-treated condition and at lower rates in the other conditions. Machining rates of type 630 are similar to type 304 stainless steel. In H900 condition, material should be machined moderately, if at all.

WELDING: Type 630 is readily welded by conventional heliarc method. Welding procedures are essentially same as those used for other chromium-nickel-type stainless steels. No preheating or post annealing is required as encountered with the martensitic 400 type stainless steels. The use of 630 or Type 308 electrodes is recommended for welding, with the choice depending upon whether or not high strength is to be developed after welding.

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