Long Products Stainless Steel NAS 700	
ASTM Designation	EN Designation
630	1.4542
S17400	

DESCRIPTION

Type 630 is commonly referred to as 17-4 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.

CHEMICAL COMPOSITION

C	Si	Mn	P	S	Cr	Ni	Cu	Cb + Ta
≤ 0.07	≤ 1.00	≤ 1.25	≤ 0.040	≤ 0.030	15.00-17.00	3.00-5.00	3.00-5.00	0.15 - 0.45

MINIMUM MECHANICAL PROPERTIES IN ANNELED CONDITION

UTS	190 ksi [1310 Mpa]
0.2% YS	170 ksi [1172 MPa]
Elongation	10%
Reduction of Area	40%
Hardness RC	40

HEAT TREATMENT

SOLUTION ANNEALING: Heat to 1900°F +/- 25°F. Hold for 1⁄2 hour after center is at temperature. Air cool or oil quench to 90°F or lower.
It is NOT recommended that type 630 is put into service in this condition (Condition A) due to low ductility and corrosion resistance.

HARDENABILITY

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.

MACHINABILITY

Type 630 can be machined in the solution treated condition and at lower rates in the other conditions. Machining rates of type 630 is 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 are recommended for welding with the choice depending upon whether or not high strength is to be developed after welding.

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 WORKABILITY

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 WORKABILITY

Type 630 should be heated uniformly to 2150 - 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.