

Type 410 is hardenable, straight-chromium stainless steels which combine superior wear resistance of high carbon alloys with the excellent corrosion resistance of chromium stainless steels. Oil quenching these alloys from temperatures between 1800°F to 1950°F (982-1066°C) produces the highest strength and/or wear resistance as well as corrosion resistance. Type 410 alloy is used where strength, hardness, and/or wear resistance must be combined with corrosion resistance.

Nominal Composition

C	Carbon – 0.15%
Mn	Manganese – 1.00%
P	Silicon – 1.00%
S	Chromium – 11.50 – 13.50%
Si	Nickel – 0.75%
Cr	Sulfur – 0.03%
Ni	Phosphorous – 0.04%

Percent by weight, maximum unless a range is listed.

Industry Applications

- Automotive exhausts, manifolds and high temperature engine components
- Medical instruments and devices
- Petro-chemical applications

Standard Inventory Specifications

410 Coil, Sheet, Bar, & Plate

UNS S41000
AMS 5504
AMS 5613 (Chemistry Only)
ASTM A 240
ASTM A 276
ASTM A 493
ASTM F 899
ASTM SA 240
B50991B
EN 1.4006
PWA-LCS
GE-S400/1000
RR SABRe Edition 2
DFARS Compliant

Features

- Good resistance to corrosion
- Good ductility
- Well suited for highly stressed parts



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Physical Properties

Properties	
Density	0.276 lb./in ³
Specific Gravity	7.65
Melting Range	2700 – 2790°F (1482-1532°C)
Modulus of Elasticity	29 x 10 ⁶ psi (200 GPa)

Coefficient of Thermal Expansion

Temperature Range		Coefficients	
°C	°F	W/m·K	Btu/(hr/ft ² /in/°F)
20-200	68-392	10.5 x 10 ⁻⁶	5.9 x 10 ⁻⁶
20-600	68-1112	11.6 x 10 ⁻⁶	6.5 x 10 ⁻⁶

Thermal Conductivity

Temperature Range		Coefficients	
°C	°F	W/m·K	Btu/(hr/ft ² /in/°F)
100	212	(0.249)	14.4

Electrical Resistivity

Temperature Range		
°C	°F	microhm-cm
20	68	56

Specific Heat

Btu/lb.-°F - .11

Mechanical Properties

Typical Annealed Properties				
HRB	0.2% Offset Yield Strength Ksi (Mpa)	Tensile Strength Ksi (Mpa)	Elongation, Percent in 2" (51 mm)	Hardening Response HRC
82-96	30 (205) – 42 (290)	65 (450) – 74 (510)	20 - 34	38-45