

SAE 1012

Component Wt. %

C 0.1 - 0.15

Fe 99.16 - 99.6

Mn 0.3 - 0.6

P Max 0.04

S Max 0.05

Material Notes:

Widely used in low strength applications. Has good formability, fair machinability, and can be hardened by cyaniding.

[Click here to view available vendors for this material.](#)

Physical Properties Metric English Comments

Density 7.87 g/cc 0.284 lb/in³

Mechanical Properties

Hardness, Brinell 105 105

Hardness, Knoop 123 123 Converted from Brinell hardness.

Hardness, Rockwell B 60 60 Converted from Brinell hardness.

Hardness, Vickers 108 108 Converted from Brinell hardness.

Tensile Strength, Ultimate 370 MPa 53700 psi

Tensile Strength, Yield 310 MPa 45000 psi

Elongation at Break 19 % 19 % In 50 mm

Reduction of Area 40 % 40 %

Modulus of Elasticity 205 GPa 29700 ksi Typical for steel

Bulk Modulus 140 GPa 20300 ksi Typical for steel

Poisson's Ratio 0.29 0.29 Typical For Steel

Machinability 55 % 55 % Based on AISI 1212 steel. as 100% machinability. The machinability of Group I bar, rod, and wire products can be improved by cold drawing.

Shear Modulus 80 GPa 11600 ksi Typical for steel

Electrical Properties

Electrical Resistivity 1.74e-005 ohm-cm 1.74e-005 ohm-cm Typical steel

Thermal Properties

Specific Heat Capacity 0.472 J/g-°C 0.113 BTU/lb-°F Typical steel

Thermal Conductivity 49.8 W/m-K 346 BTU-in/hr-ft²-°F Typical steel

