

SAE 1022

Component Wt. %

C 0.17 - 0.23

Fe 98.68 - 99.13

Mn 0.7 - 1

P Max 0.04

S Max 0.05

#### Material Notes:

Has fair machinability, fair to good weldability, and excellent formability. Cold drawing markedly increases the tensile strength of 1022 steel.

#### Physical Properties Metric English Comments

Density 7.868 g/cc 0.284 lb/in<sup>3</sup>

#### Mechanical Properties

Hardness, Brinell 137 137

Hardness, Knoop 156 156 Converted from Brinell hardness.

Hardness, Rockwell B 75 75 Converted from Brinell hardness.

Hardness, Vickers 143 143 Converted from Brinell hardness.

Tensile Strength, Ultimate 475 MPa 68900 psi

Tensile Strength, Yield 400 MPa 58000 psi

Elongation at Break 15 % 15 % 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 70 % 70 % Based on AISI 1212 steel. as 100% machinability

Shear Modulus 80 GPa 11600 ksi Typical for steel

#### Electrical Properties

Electrical Resistivity 1.59e-005 ohm-cm 1.59e-005 ohm-cm annealed specimen; 0°C (32°F)

Electrical Resistivity at Elevated Temperature 2.19e-005 ohm-cm 2.19e-005 ohm-cm annealed specimen; 100°C (212°F)

Electrical Resistivity at Elevated Temperature 2.93e-005 ohm-cm 2.93e-005 ohm-cm annealed specimen; 200°C (390°F)

#### 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-ft<sup>2</sup>-°F Typical steel

