

SAE 1035

Component    Wt. %

C 0.31 - 0.38

Fe 98.63 - 99.09

Mn 0.6 - 0.9

P Max 0.04

S Max 0.05

#### Material Notes:

Water-hardening steels suitable for small parts of moderate strength. Used in levers, bolts, nuts, studs, and similar parts which are headed, upset, or extruded.

#### Physical Properties Metric English Comments

Density 7.85 g/cc 0.284 lb/in<sup>3</sup>

#### Mechanical Properties

Hardness, Brinell 183 183

Hardness, Knoop 204 204    Converted from Brinell hardness.

Hardness, Rockwell B 89 89    Converted from Brinell hardness.

Hardness, Vickers 192 192    Converted from Brinell hardness.

Tensile Strength, Ultimate 585 MPa 84800 psi

Tensile Strength, Yield 370 MPa 53700 psi

Elongation at Break 30 % 30 %    In 50 mm

Reduction of Area 53 % 53 %

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 65 % 65 %    Based on AISI 1212 steel. as 100% machinability

Shear Modulus 80 GPa 11600 ksi    Typical for steel

#### Electrical Properties

Electrical Resistivity 1.63e-005 ohm-cm 1.63e-005 ohm-cm    annealed specimen; 0°C (32°F)

Electrical Resistivity at Elevated Temperature 2.17e-005 ohm-cm 2.17e-005 ohm-cm annealed specimen; 100°C (212°F)

#### Thermal Properties

CTE, linear 20°C 11  $\mu\text{m}/\text{m}\cdot^\circ\text{C}$  6.11  $\mu\text{in}/\text{in}\cdot^\circ\text{F}$

CTE, linear 250°C 12.6  $\mu\text{m}/\text{m}\cdot^\circ\text{C}$  7  $\mu\text{in}/\text{in}\cdot^\circ\text{F}$

CTE, linear 500°C 13.9  $\mu\text{m}/\text{m}\cdot^\circ\text{C}$  7.72  $\mu\text{in}/\text{in}\cdot^\circ\text{F}$

Specific Heat Capacity 0.486 J/g $\cdot^\circ\text{C}$  0.116 BTU/lb $\cdot^\circ\text{F}$  annealed; 50-100°C (122-212°F)

Specific Heat Capacity at Elevated Temperature 0.519 J/g $\cdot^\circ\text{C}$  0.124 BTU/lb $\cdot^\circ\text{F}$  annealed; 150-200°C (302-392°F)

Specific Heat Capacity at Elevated Temperature 0.586 J/g $\cdot^\circ\text{C}$  0.14 BTU/lb $\cdot^\circ\text{F}$  annealed; 350-400°C (662-752°F)

Thermal Conductivity 51.9 W/m-K 360 BTU-in/hr-ft $^2\cdot^\circ\text{F}$

