

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/in³

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 $^2\cdot^\circ\text{F}$

