

AISI 4340 Steel, normalized, 25 mm round

Categories: [Metal](#); [Ferrous Metal](#); [Alloy Steel](#); [AISI 4000 Series Steel](#); [Low Alloy Steel](#); [Carbon Steel](#); [Medium Carbon Steel](#)


Material Notes: AISI 4340 has a favorable response to heat treatment (usually oil quenching followed by tempering) and exhibits a good combination of ductility and strength when treated thusly. Uses include piston pins, bearings, ordnance, gears, dies, and pressure vessels.


Key Words: alloy steels, UNS G43400, AMS 5331, AMS 6359, AMS 6414, AMS 6415, ASTM A322, ASTM A331, ASTM A505, ASTM A519, ASTM A547, ASTM A646, MIL SPEC MIL-S-16974, B.S. 817 M 40 (UK), SAE J404, SAE J412, SAE J770, DIN 1.6565, JIS SNCM 8, IS 1570 40Ni2Cr1Mo28, IS 1570 40NiCr1Mo15

Vendors: No vendors are listed for this material. Please [click here](#) if you are a supplier and would like information on how to add your listing to this material.

Physical Properties	Metric	English	Comments
Density	7.85 g/cc	0.284 lb/in ³	

Mechanical Properties	Metric	English	Comments
Hardness, Brinell	363	363	
Hardness, Knoop	392	392	Converted from Brinell
Hardness, Rockwell B	100	100	Converted from Brinell
Hardness, Rockwell C	40	40	Converted from Brinell
Hardness, Vickers	384	384	Converted from Brinell
Tensile Strength, Ultimate	1282 MPa	185900 psi	
Tensile Strength, Yield	862 MPa	125000 psi	
Elongation at Break	12.2 %	12.2 %	
Reduction of Area	36.3 %	36.3 %	
Modulus of Elasticity	200 GPa	29000 ksi	
Bulk Modulus	159 GPa	23100 ksi	Estimated from elastic modulus
Poissons Ratio	0.29	0.29	Typical for steel
Machinability	50 %	50 %	annealed and cold drawn. Based on 100% machinability for AISI 1212 steel.
Shear Modulus	78.0 GPa	11300 ksi	Estimated from elastic modulus

Electrical Properties	Metric	English	Comments
Electrical Resistivity 	0.0000248 ohm-cm @Temperature 20.0 °C	0.0000248 ohm-cm @Temperature 68.0 °F	
	0.0000298 ohm-cm @Temperature 100 °C	0.0000298 ohm-cm @Temperature 212 °F	
	0.0000552 ohm-cm @Temperature 400 °C	0.0000552 ohm-cm @Temperature 752 °F	
	0.0000797 ohm-cm @Temperature 600 °C	0.0000797 ohm-cm @Temperature 1110 °F	

Thermal Properties	Metric	English	Comments
CTE, linear 	12.3 µm/m-°C @Temperature 20.0 °C	6.83 µin/in-°F @Temperature 68.0 °F	specimen oil hardened, 600°C (1110°F) temper
	12.6 µm/m-°C @Temperature 21.0 - 260 °C	7.00 µin/in-°F @Temperature 69.8 - 500 °F	1.88% Ni, normalized and tempered
	12.7 µm/m-°C @Temperature 20.0 °C	7.06 µin/in-°F @Temperature 68.0 °F	specimen oil hardened, 600°C (1110°F) temper
	13.7 µm/m-°C @Temperature 250 °C	7.61 µin/in-°F @Temperature 482 °F	specimen oil hardened, 600°C (1110°F) temper
	13.7 µm/m-°C @Temperature 21.0 - 540 °C	7.61 µin/in-°F @Temperature 69.8 - 1000 °F	1.88% Ni, normalized and tempered
	13.9 µm/m-°C @Temperature 21.0 - 540 °C	7.72 µin/in-°F @Temperature 69.8 - 1000 °F	1.90% Ni, quenched, tempered

	14.5 $\mu\text{m}/\text{m}\cdot^{\circ}\text{C}$ @Temperature 500 $^{\circ}\text{C}$	8.06 $\mu\text{in}/\text{in}\cdot^{\circ}\text{F}$ @Temperature 932 $^{\circ}\text{F}$	specimen oil hardened, 600 $^{\circ}\text{C}$ (1110 $^{\circ}\text{F}$) temper
Specific Heat Capacity	0.475 $\text{J}/\text{g}\cdot^{\circ}\text{C}$	0.114 $\text{BTU}/\text{lb}\cdot^{\circ}\text{F}$	Typical 4000 series steel
Thermal Conductivity	44.5 $\text{W}/\text{m}\cdot\text{K}$	309 $\text{BTU}\cdot\text{in}/\text{hr}\cdot\text{ft}^2\cdot^{\circ}\text{F}$	Typical steel

Component Elements Properties	Metric	English	Comments
Carbon, C	0.37 - 0.43 %	0.37 - 0.43 %	
Chromium, Cr	0.70 - 0.90 %	0.70 - 0.90 %	
Iron, Fe	95.195 - 96.33 %	95.195 - 96.33 %	As remainder
Manganese, Mn	0.60 - 0.80 %	0.60 - 0.80 %	
Molybdenum, Mo	0.20 - 0.30 %	0.20 - 0.30 %	
Nickel, Ni	1.65 - 2.0 %	1.65 - 2.0 %	
Phosphorus, P	≤ 0.035 %	≤ 0.035 %	
Silicon, Si	0.15 - 0.30 %	0.15 - 0.30 %	
Sulfur, S	≤ 0.040 %	≤ 0.040 %	

[References](#) for this datasheet.

Some of the values displayed above may have been converted from their original units and/or rounded in order to display the information in a consistent format. Users requiring more precise data for scientific or engineering calculations can click on the property value to see the original value as well as raw conversions to equivalent units. We advise that you only use the original value or one of its raw conversions in your calculations to minimize rounding error. We also ask that you refer to MatWeb's [terms of use](#) regarding this information. [Click here](#) to view all the property values for this datasheet as they were originally entered into MatWeb.