



## 446 Stainless Steel, Annealed and Cold Drawn Bar

Categories: [Metal](#); [Ferrous Metal](#); [Stainless Steel](#); [T 400 Series Stainless Steel](#)

**Material Notes:** The excellent corrosion resistance of this non-hardenable, [ferritic stainless](#) is due to the high chromium content. This allows use in applications such as heaters, burners, nozzles, electrodes, and metal-ceramic seals. Typical annealing temperatures are 730-815°C; followed by air or water quench.

**Key Words:** ASME SA268; ASTM A176; ASTM A276; ASTM A314; ASTM A473; ASTM A511; ASTM A580, UNS S44600; FED QQ-S-763; FED QQ-S-766; Mil Spec MIL-S-862; SAE J405 (51466)

**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	7.80 g/cc	0.282 lb/in <sup>3</sup>	
<b>Mechanical Properties</b>			
Hardness, Brinell	185	185	Estimated from Rockwell B
Hardness, Knoop	201	201	Estimated from Rockwell B
Hardness, Rockwell A	55.2	55.2	Estimated from Rockwell B
Hardness, Rockwell B	90	90	
Hardness, Vickers	185	185	Estimated from Rockwell B
Tensile Strength, Ultimate	585 MPa	84800 psi	
Tensile Strength, Yield	485 MPa @Strain 0.200 %	70300 psi @Strain 0.200 %	
Elongation at Break	20 %	20 %	in 5 cm.
Reduction of Area	45 %	45 %	
Modulus of Elasticity	200 GPa	29000 ksi	Annealed
<b>Electrical Properties</b>			
Electrical Resistivity	0.0000640 ohm-cm	0.0000640 ohm-cm	
<b>Thermal Properties</b>			
CTE, linear 	10.4 µm/m-°C @Temperature 0.000 - 100 °C	5.78 µin/in-°F @Temperature 32.0 - 212 °F	
	10.8 µm/m-°C @Temperature 0.000 - 315 °C	6.00 µin/in-°F @Temperature 32.0 - 599 °F	
	11.2 µm/m-°C @Temperature 0.000 - 540 °C	6.22 µin/in-°F @Temperature 32.0 - 1000 °F	
	11.5 µm/m-°C @Temperature 0.000 - 650 °C	6.39 µin/in-°F @Temperature 32.0 - 1200 °F	
	12.1 µm/m-°C @Temperature 0.000 - 980 °C	6.72 µin/in-°F @Temperature 32.0 - 1800 °F	
Specific Heat Capacity	0.460 J/g-°C	0.110 BTU/lb-°F	
Thermal Conductivity 	21.6 W/m-K @Temperature 500 °C	150 BTU-in/hr-ft <sup>2</sup> -°F @Temperature 932 °F	
Melting Point	1425 - 1510 °C	2597 - 2750 °F	
Solidus	1425 °C	2597 °F	
Liquidus	1510 °C	2750 °F	
Maximum Service Temperature, Air	1095 °C	2003 °F	Oxidation resistant for service up to 1095°C. Mechanical properties suffer below this point.

Component Elements Properties	Metric	English	Comments
Carbon, C	<= 0.20 %	<= 0.20 %	
Chromium, Cr	23 - 27 %	23 - 27 %	
Iron, Fe	75 %	75 %	As remainder
Manganese, Mn	<= 1.5 %	<= 1.5 %	
Nickel, Ni	<= 0.25 %	<= 0.25 %	
Phosphorous, P	<= 0.040 %	<= 0.040 %	
Silicon, Si	<= 1.0 %	<= 1.0 %	
Sulfur, S	<= 0.030 %	<= 0.030 %	

[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.