




303 Stainless Steel, annealed

Categories: [Metal](#); [Ferrous Metal](#); [Heat Resisting](#); [Stainless Steel](#); [T 300 Series Stainless Steel](#)

Material Notes: Short time tensile test



Key Words: T303, T 303, 303SS, 303 SS, AFNOR Z 10 CNF 18.09 (Fr), UNI X 10 CrNiS 18 09, SUS 303, SS14 2346 (Sweden), B.S. 303 S 21, UNS S30300, AMS 5640 (1), ASME SA194, ASME SA320, ASTM A194, ASTM A314, ASTM A320, ASTM A320, ASTM A473, ASTM A581, ASTM A582, MIL SPEC MIL-S-862, SAE J405 (30303), DIN 1.4305, X12CrNiS188, EN 58M, austenitic, ISO 683/13 17, 18-8

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	8.00 g/cc	0.289 lb/in ³	
Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	620 MPa	89900 psi	
	140 MPa @Temperature 870 °C	20300 psi @Temperature 1600 °F	
	205 MPa @Temperature 760 °C	29700 psi @Temperature 1400 °F	
	310 MPa @Temperature 650 °C	45000 psi @Temperature 1200 °F	
	380 MPa @Temperature 540 °C	55100 psi @Temperature 1000 °F	
	420 MPa @Temperature 425 °C	60900 psi @Temperature 797 °F	
Tensile Strength, Yield	240 MPa @Strain 0.200 %	34800 psi @Strain 0.200 %	
	70.0 MPa @Strain 0.200 %, Temperature 870 °C	10200 psi @Strain 0.200 %, Temperature 1600 °F	
	145 MPa @Strain 0.200 %, Temperature 760 °C	21000 psi @Strain 0.200 %, Temperature 1400 °F	
	205 MPa @Strain 0.200 %, Temperature 650 °C	29700 psi @Strain 0.200 %, Temperature 1200 °F	
	235 MPa @Strain 0.200 %, Temperature 540 °C	34100 psi @Strain 0.200 %, Temperature 1000 °F	
	240 MPa @Strain 0.200 %, Temperature 425 °C	34800 psi @Strain 0.200 %, Temperature 797 °F	
Elongation at Break	50 %	50 %	in 50 mm
	30 % @Temperature 650 °C	30 % @Temperature 1200 °F	in 50 mm
	31 % @Temperature 760 °C	31 % @Temperature 1400 °F	in 50 mm
	34 % @Temperature 870 °C	34 % @Temperature 1600 °F	in 50 mm
	34 % @Temperature 540 °C	34 % @Temperature 1000 °F	in 50 mm
	35 % @Temperature 425 °C	35 % @Temperature 797 °F	in 50 mm
Tensile Modulus	193 GPa	28000 ksi	
Poissons Ratio	0.25	0.25	Calculated
Fatigue Strength	240 MPa	34800 psi	annealed
	330 MPa	47900 psi	25% hardened

Shear Modulus	77.2 GPa	11200 ksi
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Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000720 ohm-cm	0.0000720 ohm-cm	
Magnetic Permeability	1.008	1.008	at RT

Thermal Properties	Metric	English	Comments
CTE, linear 	17.2 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	9.56 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	
	@Temperature 0.000 - 100 °C	@Temperature 32.0 - 212 °F	
	17.8 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	9.89 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	
	@Temperature 0.000 - 315 °C	@Temperature 32.0 - 599 °F	
	18.4 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	10.2 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	
	@Temperature 0.000 - 540 °C	@Temperature 32.0 - 1000 °F	
	18.7 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	10.4 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	
	@Temperature 0.000 - 650 °C	@Temperature 32.0 - 1200 °F	
Specific Heat Capacity	0.500 J/g $\cdot^\circ\text{C}$	0.120 BTU/lb $\cdot^\circ\text{F}$	
	@Temperature 0.000 - 100 °C	@Temperature 32.0 - 212 °F	
Thermal Conductivity 	16.2 W/m-K	112 BTU-in/hr-ft $^2\cdot^\circ\text{F}$	
	@Temperature 100 °C	@Temperature 212 °F	
	21.5 W/m-K	149 BTU-in/hr-ft $^2\cdot^\circ\text{F}$	
	@Temperature 500 °C	@Temperature 932 °F	
Melting Point	1400 - 1420 °C	2550 - 2590 °F	
Solidus	1400 °C	2550 °F	
Liquidus	1420 °C	2590 °F	

Component Elements Properties	Metric	English	Comments
Carbon, C	<= 0.15 %	<= 0.15 %	
Chromium, Cr	18 %	18 %	
Iron, Fe	69 %	69 %	
Manganese, Mn	<= 2.0 %	<= 2.0 %	
Molybdenum, Mo	<= 0.60 %	<= 0.60 %	
Nickel, Ni	9.0 %	9.0 %	
Phosphorus, P	<= 0.20 %	<= 0.20 %	
Silicon, Si	<= 1.0 %	<= 1.0 %	
Sulfur, S	>= 0.15 %	>= 0.15 %	

[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.