

Crucible Steel 422 Stainless Steel

Category : Metal , Ferrous Metal , Martensitic , Stainless Steel , T 400 Series Stainless Steel

Material Notes:

Crucible 422 is a hardenable martensitic stainless steel which is being widely used for high temperatures up to 1200°F. It has excellent creep-rupture properties in the range of 600/1200°F and is capable of being heat treated to various high strength levels depending on section, form, and application involved. Crucible 422 offers designers in the aircraft and power industries high strength/weight ratios from room temperature to 1200°F. The composition is carefully balanced to provide a microstructure which is virtually all tempered martensite after heat treatment. This structure assures uniformity of mechanical properties with a minimum of directionality. Information provided by Crucible Specialty Metals.

Order this product through the following link:

http://www.lookpolymers.com/polymer_Crucible-Steel-422-Stainless-Steel.php

Physical Properties	Metric	English	Comments
Specific Gravity	7.78 g/cc	7.78 g/cc	

Mechanical Properties	Metric	English	Comments
Hardness, Rockwell C	35	35	Double tempered; Tempering Temperature- 1350°F
	48	48	Tempering Temperature- 700°F
Tensile Strength, Ultimate	1030 MPa	149000 psi	Tempering Temperature- 1200°C
	1580 MPa	229000 psi	Tempering Temperature- 600°F
	393 MPa @Temperature 649 °C	57000 psi @Temperature 1200 °F	Tempering Temperature-1200°F
Tensile Strength, Yield	1590 MPa @Temperature 316 °C	230000 psi @Temperature 600 °F	Tempering Temperature-800°F
	317 MPa @Temperature 649 °C	46000 psi @Temperature 1200 °F	Tempering Temperature-1200°F
	1050 MPa @Temperature 316 °C	153000 psi @Temperature 600 °F	Tempering Temperature-800°F
	862 MPa @Strain 0.200 %	125000 psi @Strain 0.200 %	Tempering Temperature-1200°F
	1000 MPa @Strain 0.200 %	145000 psi @Strain 0.200 %	Tempering Temperature- 600°F
Elongation at Break	16 %	16 %	in 2"; Tempering Temperature- 600°F

Mechanical Properties	Metric	English	Comments
	19 %	19 %	1200°F
	16 % @Temperature 316 °C	16 % @Temperature 600 °F	Tempering Temperature-800°F
	21 % @Temperature 649 °C	21 % @Temperature 1200 °F	Tempering Temperature-1200°F
Reduction of Area	52 %	52 %	Tempering Temperature-1200°F
	56 %	56 %	Tempering Temperature- 600°F
	13 % @Temperature 316 °C	13 % @Temperature 600 °F	Tempering Temperature-800°F
	85 % @Temperature 649 °C	85 % @Temperature 1200 °F	Tempering Temperature-1200°F
Modulus of Elasticity	205 GPa	29800 ksi	
	141 GPa @Temperature 593 °C	20500 ksi @Temperature 1100 °F	
Poissons Ratio	0.23	0.23	
	0.16 @Temperature 593 °C	0.16 @Temperature 1100 °F	
Shear Modulus	62.1 GPa	9000 ksi	
	82.7 GPa @Temperature 23.9 °C	12000 ksi @Temperature 75.0 °F	
Charpy Impact	8.13 - 9.49 J	6.00 - 7.00 ft-lb	RT
	4.07 - 5.42 J @Temperature -73.3 °C	3.00 - 4.00 ft-lb @Temperature -100 °F	
	43.4 - 51.5 J @Temperature 204 °C	32.0 - 38.0 ft-lb @Temperature 400 °F	

Thermal Properties	Metric	English	Comments
CTE, linear	10.6 µm/m-°C @Temperature 21.1 - 260 °C	5.90 µin/in-°F @Temperature 70.0 - 500 °F	

Thermal Properties	12.1 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$ Metric	6.70 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$ English	Comments
	@Temperature 21.1 - 649 $^\circ\text{C}$	@Temperature 70.0 - 1200 $^\circ\text{F}$	
Specific Heat Capacity	0.460 J/g- $^\circ\text{C}$	0.110 BTU/lb- $^\circ\text{F}$	
	@Temperature 0.000 - 100 $^\circ\text{C}$	@Temperature 32.0 - 212 $^\circ\text{F}$	
Thermal Conductivity	25.1 W/m-K	174 BTU-in/hr-ft 2 - $^\circ\text{F}$	
	@Temperature 100 $^\circ\text{C}$	@Temperature 212 $^\circ\text{F}$	

Component Elements Properties	Metric	English	Comments
Carbon, C	0.23 %	0.23 %	
Chromium, Cr	11.5 %	11.5 %	
Iron, Fe	\geq 84.12 %	\geq 84.12 %	As Remainder
Manganese, Mn	0.75 %	0.75 %	
Molybdenum, Mo	1.0 %	1.0 %	
Nickel, Ni	0.80 %	0.80 %	
Silicon, Si	0.35 %	0.35 %	
Tungsten, W	1.0 %	1.0 %	
Vanadium, V	0.25 %	0.25 %	

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