

Carpenter Custom 455® Stainless Steel, Annealed, 1.27 mm Strip

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

Material Notes:

Data provided by Carpenter Technology Corporation. Recognizing the need for high-strength alloys with good corrosion resistance to atmospheric environments, the Carpenter Research Laboratory developed Custom 455® stainless, a martensitic age-hardenable stainless steel. This alloy is relatively soft and formable in the annealed condition. A single-step aging treatment develops exceptionally high yield strength with good ductility and toughness. This stainless can be machined in the annealed condition, and welded in much the same manner as other precipitation hardenable stainless steels. Because of its low work-hardening rate, it can be extensively cold formed. The dimensional change during hardening is only about -0.001 in/in, which permits close-tolerance finish machining in the annealed state. Custom 455 stainless represents a significant advancement in the area of precipitation hardening stainless steels. It should be considered where simplicity of heat treatment, ease of fabrication, high strength and corrosion resistance are required in combination. Because of the unique combination of high strength and corrosion resistance of Custom 455 stainless there are few other alloys available for consideration. Carpenter PH13-8 Mo can be considered where good transverse toughness and ductility are necessary in large sections. Custom 455® is a registered trademark of Carpenter Technology Corporation.

Order this product through the following link:

http://www.lookpolymers.com/polymer_Carpenter-Custom-455-Stainless-Steel-Annealed-127-mm-Strip.php

Physical Properties	Metric	English	Comments
Density	7.76 g/cc	0.280 lb/in ³	

Mechanical Properties	Metric	English	Comments
Hardness, Brinell	318	318	Estimated from Rockwell C for Brinell test with 3000 kg load, 10 mm ball.
Hardness, Knoop	346	346	Estimated from Rockwell C
Hardness, Rockwell C	34	34	
Hardness, Vickers	333	333	Estimated from Rockwell C
Tensile Strength, Ultimate	1103 MPa	160000 psi	
Tensile Strength, Yield	1034 MPa @Strain 0.200 %	150000 psi @Strain 0.200 %	
Elongation at Break	6.0 %	6.0 %	In 50 mm
Modulus of Elasticity	200 GPa	29000 ksi	
Poissons Ratio	0.30 @Temperature 23.0 °C	0.30 @Temperature 73.4 °F	
Shear Modulus	76.9 GPa	11200 ksi	

Mechanical Properties	@Temperature 23.0 °C Metric	@Temperature 73.4 °F English	Comments
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Thermal Properties	Metric	English	Comments
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CTE, linear	10.6 $\mu\text{m}/\text{m}\cdot\text{°C}$	5.89 $\mu\text{in}/\text{in}\cdot\text{°F}$	
	@Temperature 22.0 - 93.0 °C	@Temperature 71.6 - 199 °F	
	11.2 $\mu\text{m}/\text{m}\cdot\text{°C}$	6.22 $\mu\text{in}/\text{in}\cdot\text{°F}$	
	@Temperature 22.0 - 260 °C	@Temperature 71.6 - 500 °F	
	12.0 $\mu\text{m}/\text{m}\cdot\text{°C}$	6.67 $\mu\text{in}/\text{in}\cdot\text{°F}$	
	@Temperature 22.0 - 482 °C	@Temperature 71.6 - 900 °F	

Component Elements Properties	Metric	English	Comments
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Carbon, C	<= 0.050 %	<= 0.050 %	
Chromium, Cr	11 - 12.5 %	11 - 12.5 %	
Copper, Cu	1.5 - 2.5 %	1.5 - 2.5 %	
Iron, Fe	75 %	75 %	as remainder
Manganese, Mn	<= 0.50 %	<= 0.50 %	
Molybdenum, Mo	<= 0.50 %	<= 0.50 %	
Nb + Ta	0.10 - 0.50 %	0.10 - 0.50 %	
Nickel, Ni	7.5 - 9.5 %	7.5 - 9.5 %	
Niobium, Nb (Columbium, Cb)	<= 0.50 %	<= 0.50 %	
Phosphorous, P	<= 0.040 %	<= 0.040 %	
Silicon, Si	<= 0.50 %	<= 0.50 %	
Sulfur, S	<= 0.030 %	<= 0.030 %	
Tantalum, Ta	<= 0.50 %	<= 0.50 %	
Titanium, Ti	0.80 - 1.4 %	0.80 - 1.4 %	

Electrical Properties	Metric	English	Comments
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Electrical Resistivity	0.0000906 ohm-cm	0.0000906 ohm-cm	
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