

## Carpenter Custom 450® Stainless Steel, 25 mm Bar, Condition H1050 (Age Hardened 566°C)

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

### Material Notes:

Data provided by Carpenter Technology Corporation. Custom 450® stainless is a martensitic age-hardenable stainless steel which exhibits very good corrosion resistance (similar to that of Stainless Type 304) with moderate strength (similar to that of Stainless Type 410). The alloy has a yield strength somewhat greater than 100 ksi (689 MPa) in the annealed condition, but is easily fabricated. A single-step aging treatment develops higher strength with good ductility and toughness. This stainless can be machined, hot-worked, and cold-formed in the same manner as other martensitic age-hardenable stainless steels. A particular advantage is ease of welding and brazing. Custom 450 stainless is generally supplied in the annealed condition, requiring no heat treatment by the user for many applications. Because it has corrosion resistance like Type 304 stainless but three times the yield strength, it has been used in applications where Type 304 was not strong enough. On the other hand, it has also replaced Type 410 stainless directly on a strength basis where Type 410 had insufficient corrosion resistance. Mechanical properties will depend on the aging temperature selected. Custom 450® is a registered trademark of Carpenter Technology Corporation.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_Carpenter-Custom-450-Stainless-Steel-25-mm-Bar-Condition-H1050-Age-Hardened-566C.php](http://www.lookpolymers.com/polymer_Carpenter-Custom-450-Stainless-Steel-25-mm-Bar-Condition-H1050-Age-Hardened-566C.php)

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

Mechanical Properties	Metric	English	Comments
Hardness, Brinell	369	369	Estimated from Rockwell C for 3000 kg load, 10 mm ball Brinell measurement.
Hardness, Knoop	403	403	Estimated from Rockwell C
Hardness, Rockwell C	40	40	
Hardness, Vickers	386	386	Estimated from Rockwell C
Tensile Strength, Ultimate	1310 MPa	190000 psi	
Tensile Strength, Yield	1207 MPa @Strain 0.200 %	175100 psi @Strain 0.200 %	
Elongation at Break	15 %	15 %	In 4D
Reduction of Area	55 %	55 %	
Modulus of Elasticity	200 GPa	29000 ksi	
Poissons Ratio	0.30	0.30	
	590 MPa	85600 psi	

<b>Mechanical Properties</b>	<b>Metric</b>	<b>English</b>	<b>Comments</b>
Shear Modulus	76.9 GPa	11200 ksi	Calculated
Charpy Impact	48.0 J	35.4 ft-lb	V-notch

<b>Thermal Properties</b>	<b>Metric</b>	<b>English</b>	<b>Comments</b>
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	

<b>Component Elements Properties</b>	<b>Metric</b>	<b>English</b>	<b>Comments</b>
Carbon, C	<= 0.050 %	<= 0.050 %	min. Nb content = 8 x C content
Chromium, Cr	14 - 16 %	14 - 16 %	
Copper, Cu	1.25 - 1.75 %	1.25 - 1.75 %	
Iron, Fe	75 %	75 %	as remainder
Manganese, Mn	<= 1.0 %	<= 1.0 %	
Molybdenum, Mo	0.50 - 1.0 %	0.50 - 1.0 %	
Nickel, Ni	5.0 - 7.0 %	5.0 - 7.0 %	
Phosphorous, P	<= 0.030 %	<= 0.030 %	
Silicon, Si	<= 1.0 %	<= 1.0 %	
Sulfur, S	<= 0.030 %	<= 0.030 %	

<b>Electrical Properties</b>	<b>Metric</b>	<b>English</b>	<b>Comments</b>
Electrical Resistivity	0.0000758 ohm-cm	0.0000758 ohm-cm	
	@Temperature 23.0 °C	@Temperature 73.4 °F	

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