

## Carpenter Custom 450® Stainless Steel, 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-Condition-H1050-Age-Hardened-566C.php](http://www.lookpolymers.com/polymer_Carpenter-Custom-450-Stainless-Steel-Condition-H1050-Age-Hardened-566C.php)

Physical Properties	Metric	English	Comments
Density	7.76 g/cc	0.280 lb/in <sup>3</sup>	H900 Condition

Mechanical Properties	Metric	English	Comments
Hardness, Brinell	342	342	Estimated from Rockwell C for 3000 kg load, 10 mm ball Brinell measurement.
Hardness, Knoop	373	373	Estimated from Rockwell C
Hardness, Rockwell C	37	37	
Hardness, Vickers	358	358	Estimated from Rockwell C
Tensile Strength, Ultimate	1103 MPa	160000 psi	
	538 MPa	78000 psi	
	@Temperature 566 °C	@Temperature 1050 °F	
	834 MPa	121000 psi	
	@Temperature 427 °C	@Temperature 801 °F	
Tensile Strength, Yield	917 MPa	133000 psi	
	@Temperature 316 °C	@Temperature 601 °F	
Tensile Strength, Proof	1172 MPa	170000 psi	

Mechanical Properties	@Temperature -18.0 °C Metric	@Temperature -0.400 English	Comments
	1241 MPa	180000 psi	
	@Temperature -73.0 °C	@Temperature -99.4 °F	
	1538 MPa	223100 psi	
	@Temperature -196 °C	@Temperature -321 °F	
Tensile Strength, Yield	1048 MPa	152000 psi	
	@Strain 0.200 %	@Strain 0.200 %	
	483 MPa	70100 psi	
	@Strain 0.200 %, Temperature 566 °C	@Strain 0.200 %, Temperature 1050 °F	
	793 MPa	115000 psi	
	@Strain 0.200 %, Temperature 427 °C	@Strain 0.200 %, Temperature 801 °F	
	862 MPa	125000 psi	
	@Strain 0.200 %, Temperature 316 °C	@Strain 0.200 %, Temperature 601 °F	
	1103 MPa	160000 psi	
	@Strain 0.200 %, Temperature -18.0 °C	@Strain 0.200 %, Temperature -0.400 °F	
	1151 MPa	166900 psi	
	@Strain 0.200 %, Temperature -73.0 °C	@Strain 0.200 %, Temperature -99.4 °F	
	1413 MPa	204900 psi	
	@Strain 0.200 %, Temperature -196 °C	@Strain 0.200 %, Temperature -321 °F	
Elongation at Break	20 %	20 %	In 4D
	13 %	13 %	In 4D
	@Temperature 427 °C	@Temperature 801 °F	
	14 %	14 %	In 4D
	@Temperature 316 °C	@Temperature 601 °F	
	21 %	21 %	In 4D
	@Temperature -73.0 °C	@Temperature -99.4 °F	
	21 %	21 %	In 4D
	@Temperature -18.0 °C	@Temperature -0.400	

Mechanical Properties	Metric	English	Comments
	22 %	22 %	In 4D
	@Temperature -196 °C	@Temperature -321 °F	
	30 %	30 %	In 4D
	@Temperature 566 °C	@Temperature 1050 °F	
Reduction of Area	66 %	66 %	
Modulus of Elasticity	200 GPa	29000 ksi	
Notched Tensile Strength	1560 MPa	226000 psi	K <sub>t</sub> = 10
	@Temperature -196 °C	@Temperature -321 °F	
	1760 MPa	255000 psi	K <sub>t</sub> = 10
	@Temperature 23.0 °C	@Temperature 73.4 °F	
	1840 MPa	267000 psi	K <sub>t</sub> = 10
	@Temperature -18.0 °C	@Temperature -0.400 °F	
	1950 MPa	283000 psi	K <sub>t</sub> = 10
	@Temperature -73.0 °C	@Temperature -99.4 °F	
Poissons Ratio	0.29	0.29	
Shear Modulus	77.5 GPa	11200 ksi	Calculated
Charpy Impact	94.0 J	69.3 ft-lb	V-notch
	7.00 J	5.16 ft-lb	V-notch
	@Temperature -196 °C	@Temperature -321 °F	
	56.0 J	41.3 ft-lb	V-notch
	@Temperature -73.0 °C	@Temperature -99.4 °F	
	87.0 J	64.2 ft-lb	V-notch
	@Temperature -18.0 °C	@Temperature -0.400 °F	
	111 J	81.9 ft-lb	V-notch
	@Temperature 316 °C	@Temperature 601 °F	
	111 J	81.9 ft-lb	V-notch
	@Temperature 427 °C	@Temperature 801 °F	
	113 J	83.3 ft-lb	V-notch
	@Temperature 566 °C	@Temperature 1050 °F	

Mechanical Properties	Metric	English	Comments
Thermal Properties	Metric	English	Comments
CTE, linear	10.8 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	6.00 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	H900 Condition
	@Temperature 24.0 - 93.0 $^\circ\text{C}$	@Temperature 75.2 - 199 $^\circ\text{F}$	
	10.87 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	6.039 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	
	@Temperature 24.0 - 260 $^\circ\text{C}$	@Temperature 75.2 - 500 $^\circ\text{F}$	H900 Condition
	11.75 $\mu\text{m}/\text{m}\cdot^\circ\text{C}$	6.528 $\mu\text{in}/\text{in}\cdot^\circ\text{F}$	H900 Condition
	@Temperature 24.0 - 593 $^\circ\text{C}$	@Temperature 75.2 - 1100 $^\circ\text{F}$	
Specific Heat Capacity	0.477 J/g- $^\circ\text{C}$	0.114 BTU/lb- $^\circ\text{F}$	
Thermal Conductivity	15.0 W/m-K	104 BTU-in/hr-ft <sup>2</sup> - $^\circ\text{F}$	condition H 900
	@Temperature 23.0 $^\circ\text{C}$	@Temperature 73.4 $^\circ\text{F}$	
	18.2 W/m-K	126 BTU-in/hr-ft <sup>2</sup> - $^\circ\text{F}$	
	@Temperature 200 $^\circ\text{C}$	@Temperature 392 $^\circ\text{F}$	condition H 900
	24.4 W/m-K	169 BTU-in/hr-ft <sup>2</sup> - $^\circ\text{F}$	condition H 900
	@Temperature 500 $^\circ\text{C}$	@Temperature 932 $^\circ\text{F}$	

Component Elements Properties	Metric	English	Comments
Carbon, C	$\leq 0.050\%$	$\leq 0.050\%$	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	$\leq 1.0\%$	$\leq 1.0\%$	
Molybdenum, Mo	0.50 - 1.0 %	0.50 - 1.0 %	
Nickel, Ni	5.0 - 7.0 %	5.0 - 7.0 %	
Phosphorous, P	$\leq 0.030\%$	$\leq 0.030\%$	
Silicon, Si	$\leq 1.0\%$	$\leq 1.0\%$	
Sulfur, S	$\leq 0.030\%$	$\leq 0.030\%$	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000846 ohm-cm	0.0000846 ohm-cm	H900 Condition

Electrical Properties

Metric

English

Comments

## Contact Songhan Plastic Technology Co.,Ltd.

Website : [www.lookpolymers.com](http://www.lookpolymers.com)

Email : [sales@lookpolymers.com](mailto:sales@lookpolymers.com)

Tel : +86 021-51131842

Mobile : +86 13061808058

Skype : lookpolymers

Address : United North Road 215,Fengxian District, Shanghai City,China