

## Carpenter Gall-Tough PLUS™ Stainless, Annealed

Category : Metal , Ferrous Metal , Stainless Steel

### Material Notes:

Data provided by Carpenter Technology Corporation. 6.4 mm diameter tensile specimens from center of 25.4 mm diameter bar annealed 1066°C 1 hour, water quenched, and ground. Threshold Galling Stress 48 MPa. The avg. total volume loss on the wear test is 10.6 mm<sup>3</sup> at 100 rpm. Gall-Tough PLUS™ stainless is a high silicon, high manganese, nitrogen strengthened, austenitic stainless alloy which exhibits superior self-mated galling resistance and metal-to-metal wear resistance. The alloy possesses higher strength than Type 316. It also exhibits chloride corrosion resistance equal to or better than Type 316, along with equivalent high temperature oxidation resistance. Gall-Tough PLUS™ is a trademark of Carpenter Technology Corporation.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_Carpenter-Gall-Tough-PLUS-Stainless-Annealed.php](http://www.lookpolymers.com/polymer_Carpenter-Gall-Tough-PLUS-Stainless-Annealed.php)

Physical Properties	Metric	English	Comments
Density	7.60 g/cc	0.275 lb/in <sup>3</sup>	

Mechanical Properties	Metric	English	Comments
Hardness, Rockwell B	90 - 95	90 - 95	Typical
Tensile Strength, Ultimate	783 MPa	114000 psi	
	160 MPa	23200 psi	
	@Temperature 871 °C	@Temperature 1600 °F	
Tensile Strength, Yield	492 MPa	71400 psi	
	603 MPa	87500 psi	
	@Temperature 649 °C	@Temperature 1200 °F	
Tensile Strength, Yield	638 MPa	92500 psi	
	423 MPa	61400 psi	
	@Temperature 204 °C	@Temperature 399 °F	
Tensile Strength, Yield	146 MPa	21200 psi	
	201 MPa	29200 psi	
	@Strain 0.200 %	@Strain 0.200 %	
Tensile Strength, Yield	146 MPa	21200 psi	
	201 MPa	29200 psi	
	@Strain 0.200 %, Temperature 871 °C	@Strain 0.200 %, Temperature 1600 °F	
Tensile Strength, Yield	201 MPa	29200 psi	
	146 MPa	21200 psi	
	@Strain 0.200 %, Temperature 649 °C	@Strain 0.200 %, Temperature 1200 °F	

Mechanical Properties	208 MPa Metric	30200 psi English	Comments
	@Strain 0.200 %, Temperature 427 °C	@Strain 0.200 %, Temperature 801 °F	
	222 MPa	32200 psi	
	@Strain 0.200 %, Temperature 204 °C	@Strain 0.200 %, Temperature 399 °F	
Elongation at Break	59 %	59 %	in 4D
	48 %	48 %	in 4D
	@Temperature 649 °C	@Temperature 1200 °F	
	58 %	58 %	in 4D
	@Temperature 427 °C	@Temperature 801 °F	
	63 %	63 %	in 4D
	@Temperature 204 °C	@Temperature 399 °F	
	124 %	124 %	in 4D
	@Temperature 871 °C	@Temperature 1600 °F	
Reduction of Area	72 %	72 %	
	60 %	60 %	
	@Temperature 649 °C	@Temperature 1200 °F	
	70 %	70 %	
	@Temperature 427 °C	@Temperature 801 °F	
	73 %	73 %	
	@Temperature 204 °C	@Temperature 399 °F	
	93 %	93 %	
	@Temperature 871 °C	@Temperature 1600 °F	
Modulus of Elasticity	184.9 GPa	26820 ksi	
Fatigue Strength	293 MPa	42500 psi	rotating beam
	@# of Cycles 1.00e+7	@# of Cycles 1.00e+7	
Charpy Impact	404 J	298 ft-lb	Typical V-Notch

Thermal Properties	Metric	English	Comments
CTE, linear	14.19 $\mu\text{m}/\text{m}\cdot\text{°C}$	7.883 $\mu\text{in}/\text{in}\cdot\text{°F}$	
	@Temperature 25.0 - 50.0 °C	@Temperature 77.0 - 122 °F	

Thermal Properties	Metric	English	Comments
	@Temperature 25.0 - 250 °C	@Temperature 77.0 - 482 °F	
	18.07 µm/m-°C	10.04 µin/in-°F	
	@Temperature 25.0 - 500 °C	@Temperature 77.0 - 932 °F	
Specific Heat Capacity	0.5055 J/g-°C	0.1208 BTU/lb-°F	
	@Temperature 50.0 - 100 °C	@Temperature 122 - 212 °F	
Thermal Conductivity	12.0 W/m-K	83.3 BTU-in/hr-ft <sup>2</sup> -°F	
	14.79 W/m-K	102.6 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 200 °C	@Temperature 392 °F	
	18.9 W/m-K	131 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 400 °C	@Temperature 752 °F	
	20.34 W/m-K	141.2 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 500 °C	@Temperature 932 °F	
Maximum Service Temperature, Air	982 °C	1800 °F	Scaling Temperature for Continuous Service

Component Elements Properties	Metric	English	Comments
Carbon, C	<= 0.15 %	<= 0.15 %	
Chromium, Cr	16.5 - 21 %	16.5 - 21 %	
Iron, Fe	62 %	62 %	as remainder
Manganese, Mn	4.0 - 8.0 %	4.0 - 8.0 %	
Molybdenum, Mo	0.50 - 2.5 %	0.50 - 2.5 %	
Nickel, Ni	6.0 - 10 %	6.0 - 10 %	
Nitrogen, N	0.050 - 0.35 %	0.050 - 0.35 %	
Phosphorous, P	<= 0.040 %	<= 0.040 %	
Silicon, Si	2.5 - 4.5 %	2.5 - 4.5 %	
Sulfur, S	<= 0.040 %	<= 0.040 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity			

Electrical Properties	0.0000947 ohm-cm Metric	0.0000947 ohm-cm English	Comments
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## Contact Songhan Plastic Technology Co.,Ltd.

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