

American Utility Metals Cromgard® Stainless Steel

Category : Metal , Ferrous Metal , Stainless Steel

Material Notes:

Cromgard is a low cost stainless steel, which is able to provide benefits of good weldability and formability, making it capable of fabrication by conventional techniques. It provides the benefits of strength, corrosion and abrasion resistance, durability and low maintenance. Cromgard generally conforms to ASTM A240 UNS S41003. Additionally, it can be certified to European standard EN 10088-2 type 1.4003. It is also included in the specification EN 10028-7 for stainless steels suitable for pressure purposes, which includes minimum specified impact values. The substantially austenitic microstructure at elevated temperatures also restricts grain growth during welding. This leads to a tough duplex martensitic/ferritic heat affected zone, responsible for good weldability.

Order this product through the following link:

http://www.lookpolymers.com/polymer_American-Utility-Metals-Cromgard-Stainless-Steel.php

Physical Properties	Metric	English	Comments
Density	7.66 g/cc	0.277 lb/in ³	

Mechanical Properties	Metric	English	Comments
Hardness, Brinell	<= 223	<= 223	per ASTM A240
Tensile Strength	>= 455 MPa	>= 66000 psi	per ASTM A240; transverse
Tensile Strength, Ultimate	333 MPa @Temperature 500 °C	48300 psi @Temperature 932 °F	Typical annealed sample; short time elevated temp.
	368 MPa @Temperature 400 °C	53400 psi @Temperature 752 °F	Typical annealed sample; short time elevated temp.
	415 MPa @Temperature 300 °C	60200 psi @Temperature 572 °F	Typical annealed sample; short time elevated temp.
	464 MPa @Temperature 200 °C	67300 psi @Temperature 392 °F	Typical annealed sample; short time elevated temp.
	545 MPa @Temperature 100 °C	79100 psi @Temperature 212 °F	Typical annealed sample; short time elevated temp.
Tensile Strength, Yield	236 MPa @Strain 0.200 %, Temperature 500 °C	34200 psi @Strain 0.200 %, Temperature 932 °F	Typical annealed sample; short time elevated temp.
	262 MPa @Strain 0.200 %, Temperature 400 °C	38000 psi @Strain 0.200 %, Temperature 752 °F	Typical annealed sample; short time elevated temp.

Mechanical Properties	280 MPa Metric	40600 psi English	Comments
	@Strain 0.200 %, Temperature 300 °C	@Strain 0.200 %, Temperature 572 °F	Typical annealed sample; short time elevated temp.
	308 MPa @Strain 0.200 %, Temperature 200 °C	44700 psi @Strain 0.200 %, Temperature 392 °F	Typical annealed sample; short time elevated temp.
	350 MPa @Strain 0.200 %, Temperature 100 °C	50800 psi @Strain 0.200 %, Temperature 212 °F	Typical annealed sample; short time elevated temp.
	>= 280 MPa @Strain 0.200 %, Thickness >=7.938 mm	>= 40600 psi @Strain 0.200 %, Thickness >=0.3125 in	per ASTM A240; transverse; 0.2% Proof
	>= 320 MPa @Strain 0.200 %, Thickness <=7.938 mm	>= 46400 psi @Strain 0.200 %, Thickness <=0.3125 in	per ASTM A240; transverse
Elongation at Break	>= 18 %	>= 18 %	per ASTM A240; transverse
Creep Strength	0.0280 MPa @Temperature 550.0 °C, Time 3.60e+7 sec	4.06 psi @Temperature 1022 °F, Time 10000 hour	time to produce 1% strain
	0.0290 MPa @Temperature 550.0 °C, Time 1.80e+7 sec	4.21 psi @Temperature 1022 °F, Time 5000 hour	time to produce 1% strain
	0.0340 MPa @Temperature 550.0 °C, Time 3.60e+6 sec	4.93 psi @Temperature 1022 °F, Time 1000 hour	time to produce 1% strain
	0.0560 MPa @Temperature 500 °C, Time 3.60e+7 sec	8.12 psi @Temperature 932 °F, Time 10000 hour	time to produce 1% strain
	0.0650 MPa @Temperature 500 °C, Time 1.80e+7 sec	9.43 psi @Temperature 932 °F, Time 5000 hour	time to produce 1% strain
	0.0883 MPa @Temperature 500 °C, Time 3.60e+6 sec	12.8 psi @Temperature 932 °F, Time 1000 hour	time to produce 1% strain
	0.1340 MPa @Temperature 450 °C,	19.44 psi @Temperature 842 °F,	time to produce 1% strain

Mechanical Properties	Time 3.60e+7 sec Metric	Time 10000 hour English	Comments
	0.151 MPa	21.9 psi	
	@Temperature 450 °C, Time 1.80e+7 sec	@Temperature 842 °F, Time 5000 hour	time to produce 1% strain
	0.195 MPa	28.3 psi	
	@Temperature 450 °C, Time 3.60e+6 sec	@Temperature 842 °F, Time 1000 hour	time to produce 1% strain
	0.2700 MPa	39.16 psi	
	@Temperature 400 °C, Time 3.60e+7 sec	@Temperature 752 °F, Time 10000 hour	time to produce 1% strain
	0.283 MPa	41.1 psi	
	@Temperature 400 °C, Time 1.80e+7 sec	@Temperature 752 °F, Time 5000 hour	time to produce 1% strain
	0.315 MPa	45.7 psi	
	@Temperature 400 °C, Time 3.60e+6 sec	@Temperature 752 °F, Time 1000 hour	time to produce 1% strain
Modulus of Elasticity	150 GPa	21800 ksi	Typical annealed sample; short time elevated temp.
	@Temperature 500 °C	@Temperature 932 °F	
	184 GPa	26700 ksi	Typical annealed sample; short time elevated temp.
	@Temperature 300 °C	@Temperature 572 °F	
	202 GPa	29300 ksi	Typical annealed sample; short time elevated temp.
	@Temperature 400 °C	@Temperature 752 °F	
	215 GPa	31200 ksi	Typical annealed sample; short time elevated temp.
	@Temperature 200 °C	@Temperature 392 °F	
	231 GPa	33500 ksi	Typical annealed sample; short time elevated temp.
	@Temperature 100 °C	@Temperature 212 °F	
Tensile Modulus	200.0 GPa	29010 ksi	
Poissons Ratio	0.32	0.32	
Fatigue Strength	296 MPa	43000 psi	
	@# of Cycles 1.00e+6	@# of Cycles 1.00e+6	
	296 MPa	43000 psi	
	@# of Cycles 4.00e+6	@# of Cycles 4.00e+6	
	338 MPa	49000 psi	
	@# of Cycles 500000	@# of Cycles 500000	

Mechanical Properties	Metric	English	Comments
	@# of Cycles 100000	@# of Cycles 100000	
Shear Modulus	77.2 GPa	11200 ksi	
Charpy Impact	>= 48.8 J	>= 36.0 ft-lb	to EN 10028-7 1.4003

Thermal Properties	Metric	English	Comments
CTE, linear	11.1 $\mu\text{m}/\text{m}\cdot\text{C}^\circ$	6.17 $\mu\text{in}/\text{in}\cdot\text{F}^\circ$	
	@Temperature -17.8 - 100 $^\circ\text{C}$	@Temperature 0.000 - 212 $^\circ\text{F}$	
	11.7 $\mu\text{m}/\text{m}\cdot\text{C}^\circ$	6.50 $\mu\text{in}/\text{in}\cdot\text{F}^\circ$	
	@Temperature -17.8 - 300 $^\circ\text{C}$	@Temperature 0.000 - 572 $^\circ\text{F}$	
	12.3 $\mu\text{m}/\text{m}\cdot\text{C}^\circ$	6.83 $\mu\text{in}/\text{in}\cdot\text{F}^\circ$	
	@Temperature -17.8 - 500 $^\circ\text{C}$	@Temperature 0.000 - 932 $^\circ\text{F}$	
Specific Heat Capacity	0.477 J/g- $^\circ\text{C}$	0.114 BTU/lb- $^\circ\text{F}$	
Thermal Conductivity	30.0 W/m-K	208 BTU-in/hr-ft $^2\cdot\text{F}^\circ$	
	@Temperature 100 $^\circ\text{C}$	@Temperature 212 $^\circ\text{F}$	
	39.9 W/m-K	277 BTU-in/hr-ft $^2\cdot\text{F}^\circ$	
	@Temperature 500 $^\circ\text{C}$	@Temperature 932 $^\circ\text{F}$	
Melting Point	1430 - 1510 $^\circ\text{C}$	2606 - 2750 $^\circ\text{F}$	
Solidus	1430 $^\circ\text{C}$	2606 $^\circ\text{F}$	
Liquidus	1510 $^\circ\text{C}$	2750 $^\circ\text{F}$	
Maximum Service Temperature, Air	620.0 $^\circ\text{C}$	1148 $^\circ\text{F}$	Continuous
	730.0 $^\circ\text{C}$	1346 $^\circ\text{F}$	Intermittent

Component Elements Properties	Metric	English	Comments
Carbon, C	<= 0.030 %	<= 0.030 %	
Chromium, Cr	10.5 - 12.5 %	10.5 - 12.5 %	
Iron, Fe	83.37 - 89.5 %	83.37 - 89.5 %	Remainder
Manganese, Mn	<= 1.5 %	<= 1.5 %	
Nickel, Ni	<= 1.5 %	<= 1.5 %	

Component Elements Properties	Metric	English	Comments
Phosphorous, P	<= 0.040 %	<= 0.040 %	
Silicon, Si	<= 1.0 %	<= 1.0 %	
Sulfur, S	<= 0.030 %	<= 0.030 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.00000678 ohm-cm	0.00000678 ohm-cm	

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