Schmolz + Bickenbach UgiPermâ„¢ 12FM Stainless Steel Bar

Category : Metal , Ferrous Metal , Ferritic , Stainless Steel

Material Notes:

Description: UgiPermâ„¢ 12FM is a 12% chrome ferritic stainless with improved magnetic properties designed for use in electro-injectors, valves and many other applications. The grade was developed for magnetic applications requiring a very low coercive magnetic field (Hc) and a very high permeability. UgiPermâ„¢ 12FM has a high level of electrical resistivity that shortens activation time when used in pulse mode. It offers excellent magnetic properties with superior corrosion resistance no offered by iron alloys.Applications: Solenoid valves, fuel injectors, irrigation valves, magnetic sensors, magnetic brakes, and electro-mechanical devices.Magnetic Properties (Heat Treatment): Uniformly heat at 800Â°/900Â°C (1470Â°F/1650Â°F) for 2 hours, then cool to 500Â°C (930Â°F) at a rate of 50Â°C (120Â°F) per hour. The cycle should be done in a dry hydrogen or vacuum atmosphere to prevent oxidation.Information provided by Schmolz + Bickenbach

Order this product through the following link:
http://www.lookpolymers.com/polymer_Schmolz-Bickenbach-UgiPerm-12FM-Stainless-Steel-Bar.php

Physical Properties	Metric	English	Comments
Density	7.72 g/cc	0.279 lb/inÂ³	

Mechanical Properties	Metric	English	Comments
Hardness, Rockwell B	87 - 92	87 - 92	
Tensile Strength	448 - 552 MPa @Thickness <=25.4 mm	65000 - 80000 psi @Thickness <=1.00 in	Cold Drawn Bar
Tensile Strength, Yield	310 - 448 MPa @Strain 0.200 %, Thickness <=25.4 mm	45000 - 65000 psi @Strain 0.200 %, Thickness <=1.00 in	Cold Drawn Bar
Elongation at Yield	>= 30 % @Thickness <=25.4 mm	>= 30 % @Thickness <=1.00 in	Cold Drawn Bar
Reduction of Area	>= 60 % @Thickness <=25.4 mm	>= 60 % @Thickness <=1.00 in	Cold Drawn Bar
Modulus of Elasticity	200 GPa	29000 ksi	Tension

Thermal Properties	Metric	English	Comments
CTE, linear	10.3 Âµm/m-Â°C @Temperature 20.0 - 100 Â°C	5.75 Âµin/in-Â°F @Temperature 68.0 - 212 Â°F	
	10.8 Âµm/m-Â°C @Temperature 20.0 - 204 Â°C	6.00 Âµin/in-Â°F @Temperature 68.0 - 400 Â°F	

Thermal Properties	Metric	English	Comments
	11.3 Âµm/m-Â°C @Temperature 20.0 - 299 Â°C	6.30 Âµin/in-Â°F @Temperature 68.0 - 570 Â°F	
	11.7 Âµm/m-Â°C @Temperature 20.0 - 432 Â°C	6.50 Âµin/in-Â°F @Temperature 68.0 - 810 Â°F	
	12.2 Âµm/m-Â°C @Temperature 20.0 - 499 Â°C	6.80 Âµin/in-Â°F @Temperature 68.0 - 930 Â°F	
Thermal Conductivity	21.9 W/m-K @Temperature 20.0 Â°C	152 BTU-in/hr-ftÂ²-Â°F @Temperature 68.0 Â°F	

Component Elements Properties	Metric	English	Comments
Carbon, C	<= 0.020 %	<= 0.020 %	
Chromium, Cr	11.5 - 12.5 %	11.5 - 12.5 %	
Iron, Fe	>= 83.44 %	>= 83.44 %	
Manganese, Mn	0.30 - 0.50 %	0.30 - 0.50 %	
Molybdenum, Mo	0.25 - 0.75 %	0.25 - 0.75 %	
Nickel, Ni	>= 0.50 %	>= 0.50 %	
Phosphorous, P	<= 0.040 %	<= 0.040 %	
Silicon, Si	1.0 - 2.0 %	1.0 - 2.0 %	
Sulfur, S	0.15 - 0.25 %	0.15 - 0.25 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000780 ohm-cm	0.0000780 ohm-cm	
Magnetic Permeability	2000 - 3000	2000 - 3000	
Magnetic Coercive Force, Hc	1.2 - 1.6 Oe	1.2 - 1.6 Oe	
Magnetic Saturation Flux Density, Bmax	17000 Gauss	17000 Gauss	
Magnetic Remanence, Br	5000 - 7000 Gauss	5000 - 7000 Gauss	
Curie Temperature	732 Â°C	1350 Â°F	

Processing Properties	Metric	English	Comments
Annealing Temperature	699 - 799 Â°C @Time 3600 sec	1290 - 1470 Â°F @Time 1.00 hour	Soft; Air cool
Hot-Working Temperature	482 Â°C	900 Â°F	Flow Stress of 110 MP at 3.6s<sup>-1<sup>
	538 Â°C	1000 Â°F	Flow Stress of 65 MP at 3.6s<sup>-1<sup>
	593 Â°C	1100 Â°F	Flow Stress of 40 MP at 3.6s<sup>-1<sup>
	649 Â°C	1200 Â°F	Flow Stress of 25 MP at 3.6s<sup>-1<sup>
	749 - 1200 Â°C	1380 - 2190 Â°F	Uniformly heating

Descriptive Properties	Value	Comments
Corrosion Resistance	Humidity	3/4
	NaCl 0.2g/l	1.65% mass loss; 60Â°C; 500 hrs
	NaCl 0.4g/l	1.6% mass loss; 60Â°C; 500 hrs
	NaCl 0.6g/l	2.4% mass loss; 60Â°C; 500 hrs
	Nitric Acid	2/4
	Sodium Carbonate	2/4

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