

Carpenter BioDur™ CCM Plus™ Medical Implant Alloy, Hot Worked

Category : Metal , Nonferrous Metal , Cobalt Alloy , Superalloy

Material Notes:

Data provided by Carpenter Technology Corporation. Medical Implant Alloy. Non-magnetic Co-Cr-Mo alloy exhibiting high strength, corrosion resistance, and wear resistance. BioDur CCM Plus alloy is a wrought powder metallurgy product produced by vacuum induction melting (VIM) followed by inert gas atomization and hot isostatic pressing to produce 100% dense billets. These billets are then processed by conventional steel-making practices to make finished products. BioDur™ and CCM Plus™ are trademarks of Carpenter Technology Corporation.

Order this product through the following link:

http://www.lookpolymers.com/polymer_Carpenter-BioDur-CCM-Plus-Medical-Implant-Alloy-Hot-Worked.php

Physical Properties	Metric	English	Comments
Density	8.28 g/cc	0.299 lb/in ³	

Mechanical Properties	Metric	English	Comments
Hardness, Brinell	400	400	Estimated from Rockwell C for Brinell test with 3000 kg load, 10 mm ball.
Hardness, Knoop	437	437	Estimated from Rockwell C
Hardness, Rockwell C	43	43	
Hardness, Vickers	418	418	Estimated from Rockwell C
Tensile Strength, Ultimate	1365 MPa	198000 psi	
Tensile Strength, Yield	930 MPa @Strain 0.200 %	135000 psi @Strain 0.200 %	
Elongation at Break	22 %	22 %	in 4D
Reduction of Area	17 %	17 %	

Thermal Properties	Metric	English	Comments
CTE, linear	12.8 µm/m-°C	7.11 µin/in-°F	
	@Temperature 0.000 - 100 °C	@Temperature 32.0 - 212 °F	
	13.1 µm/m-°C	7.30 µin/in-°F	
	@Temperature 25.0 - 300 °C	@Temperature 77.0 - 572 °F	
	14.7 µm/m-°C	8.18 µin/in-°F	
	@Temperature 25.0 -	@Temperature 77.0 -	

Thermal Properties	700 °C Metric	1290 °F English	Comments
	16.92 $\mu\text{m}/\text{m}\cdot^{\circ}\text{C}$	9.400 $\mu\text{in}/\text{in}\cdot^{\circ}\text{F}$	
	@Temperature 25.0 - 1000 °C	@Temperature 77.0 - 1830 °F	
Specific Heat Capacity	0.452 J/g-°C	0.108 BTU/lb-°F	
	@Temperature 23.0 °C	@Temperature 73.4 °F	
	0.590 J/g-°C	0.141 BTU/lb-°F	
	@Temperature 600 °C	@Temperature 1110 °F	
	0.673 J/g-°C	0.161 BTU/lb-°F	
	@Temperature 1100 °C	@Temperature 2010 °F	
Thermal Conductivity	12.766 W/m-K	88.596 BTU-in/hr-ft ² -°F	
	@Temperature 23.0 °C	@Temperature 73.4 °F	
	25.264 W/m-K	175.33 BTU-in/hr-ft ² -°F	
	@Temperature 600 °C	@Temperature 1110 °F	
	35.022 W/m-K	243.05 BTU-in/hr-ft ² -°F	
	@Temperature 1177 °C	@Temperature 2151 °F	

Component Elements Properties	Metric	English	Comments
Carbon, C	0.20 - 0.30 %	0.20 - 0.30 %	
Chromium, Cr	26 - 30 %	26 - 30 %	
Cobalt, Co	66 %	66 %	as remainder
Molybdenum, Mo	5.0 - 7.0 %	5.0 - 7.0 %	
Nitrogen, N	0.15 - 0.20 %	0.15 - 0.20 %	

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