

Kennametal Stellite Stellite® 4 Cobalt Chromium Alloy

Category : Metal , Nonferrous Metal , Cobalt Alloy , Superalloy

Material Notes:

The higher tungsten content of Stellite alloy 4 gives improved high temperature properties and an increase in abrasive wear resistance over Stellite alloy 6, but not as good as Stellite alloy 12 or 3. Adhesive wear is similar to Stellite alloy 6, but resistance improves as the load increases. Galling resistance is excellent. The alloy is brittle and withstands less impact than either Stellite alloy 6 or 12. This material is suitable for high temperature abrasion in corrosive environment. Stellite Alloy 4 has higher corrosion resistance than Stellite alloy 6 in oxidizing environments such as nitric and sulphuric acids. This improvement is due to the higher chromium content in the cobalt rich matrix making this material suitable for pump components. The alloy has excellent resistance to manganese dioxide, carbon particles and ammonium and zinc chlorides, used in the manufacturing of dry batteries. Corrosion resistance will vary depending on acid concentration, temperature, stress and contamination thus production exposure tests are recommended. This material does not respond to thermal treatments but may be stress relieved before and during machining by holding at 1650°F for 4 hours and slow cool. Applications involve corrosion and wear such as pump sleeves and impellers. For high temperature wear the material has been used for dies in hot pressing or extrusion of copper and aluminum. The modified alloy Stellite 4B resist abrasion and corrosion from manganese dioxide, carbon particles and ammonium and zinc chlorides used in the dry battery industry. Information provided by Deloro Stellite Inc. Product of former Deloro Stellite Inc.

Order this product through the following link:

http://www.lookpolymers.com/polymer_Kennametal-Stellite-Stellite-4-Cobalt-Chromium-Alloy.php

Physical Properties	Metric	English	Comments
Density	8.80 g/cc	0.318 lb/in ³	

Mechanical Properties	Metric	English	Comments
Hardness, Rockwell C	42 - 53	42 - 53	
Hardness, Vickers	410 - 545	410 - 545	
Tensile Strength, Ultimate	940 MPa	136000 psi	
Tensile Strength, Yield	707 MPa	103000 psi	
Elongation at Break	<= 1.0 %	<= 1.0 %	
Modulus of Elasticity	235 GPa	34100 ksi	
Ultimate Compressive Strength	1714 MPa	248600 psi	
Izod Impact Unnotched	6.80 J	5.02 ft-lb	

Thermal Properties	Metric	English	Comments
CTE, linear	12.8 µm/m-°C	7.11 µin/in-°F	
	@Temperature 20.0 -	@Temperature 68.0 -	

Thermal Properties	100 °C Metric	212 °F English	Comments
	13.7 µm/m-°C	7.61 µin/in-°F	
	@Temperature 20.0 - 300 °C	@Temperature 68.0 - 572 °F	
	14.0 µm/m-°C	7.78 µin/in-°F	
	@Temperature 20.0 - 500 °C	@Temperature 68.0 - 932 °F	
	14.2 µm/m-°C	7.89 µin/in-°F	
	@Temperature 20.0 - 600 °C	@Temperature 68.0 - 1110 °F	
	14.8 µm/m-°C	8.22 µin/in-°F	
	@Temperature 20.0 - 700 °C	@Temperature 68.0 - 1290 °F	
	15.3 µm/m-°C	8.50 µin/in-°F	
	@Temperature 20.0 - 800 °C	@Temperature 68.0 - 1470 °F	
	16.2 µm/m-°C	9.00 µin/in-°F	
	@Temperature 20.0 - 1000 °C	@Temperature 68.0 - 1830 °F	
Thermal Conductivity	14.7 W/m-K	102 BTU-in/hr-ft ² -°F	
Melting Point	1246 - 1356 °C	2275 - 2473 °F	
Solidus	1246 °C	2275 °F	
Liquidus	1356 °C	2473 °F	

Component Elements Properties	Metric	English	Comments
Carbon, C	1.0 %	1.0 %	
Chromium, Cr	30 %	30 %	
Cobalt, Co	51 %	51 %	As remainder
Iron, Fe	1.0 %	1.0 %	
Nickel, Ni	2.0 %	2.0 %	
Silicon, Si	0.50 %	0.50 %	
Tungsten, W	14 %	14 %	

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