Kennametal Stellite Stellite® 31 PM with P/M Processing; heat treated at 93°C (200°F) and water quenched

Categories: Metal; Nonferrous Metal; Cobalt Alloy; Superalloy

Material Notes: Typical applications include, miscellaneous wear parts. Data provided by the manufacturer, Deloro Stellite Inc.

Product of former Deloro Stellite Inc.

Vendors: **Click here to view all available suppliers for this material.**

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Physical Properties	Metric	English	Comments
Density	8.45 g/cc	0.305 lb/in³	P/M (98%)
	8.61 g/cc	0.311 lb/in³	Theoretical

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	828 MPa	120000 psi	
	414 MPa @Temperature 760 °C	60000 psi @Temperature 1400 °F	
	614 MPa @Temperature 649 °C	89100 psi @Temperature 1200 °F	
	676 MPa @Temperature 538 °C	98000 psi @Temperature 1000 °F	
Tensile Strength, Yield	497 MPa @Strain 0.200 %	72100 psi @Strain 0.200 %	
	290 MPa @Strain 0.200 %, Temperature 649 °C	42100 psi @Strain 0.200 %, Temperature 1200 °F	
	311 MPa @Strain 0.200 %, Temperature 760 °C	45100 psi @Strain 0.200 %, Temperature 1400 °F	
	331 MPa @Strain 0.200 %, Temperature 538 °C	48000 psi @Strain 0.200 %, Temperature 1000 °F	
Elongation at Break	4.0 %	4.0 %	in 25.4 mm
	13 % @Temperature 649 °C	13 % @Temperature 1200 °F	in 25.4 mm
	14 % @Temperature 538 °C	14 % @Temperature 1000 °F	in 25.4 mm
	21 % @Temperature 760 °C	21 % @Temperature 1400 °F	in 25.4 mm

Thermal Properties	Metric	English	Comments
CTE, linear	14.1 µm/m-°C @Temperature 21.0 - 316 °C	7.83 µin/in-°F @Temperature 69.8 - 601 °F	
	14.5 µm/m-°C @Temperature 21.0 - 427 °C	8.06 µin/in-°F @Temperature 69.8 - 801 °F	
	15.1 µm/m-°C @Temperature 21.0 - 538 °C	8.39 µin/in-°F @Temperature 69.8 - 1000 °F	
	15.7 µm/m-°C @Temperature 21.1 - 649 °C	8.72 µin/in-°F @Temperature 70.0 - 1200 °F	
	16.5 µm/m-°C @Temperature 21.1 - 816 °C	9.17 µin/in-°F @Temperature 70.0 - 1500 °F	
	16.6 µm/m-°C @Temperature 21.1 - 871 °C	9.22 µin/in-°F @Temperature 70.0 - 1600 °F	

Component Elements Properties	Metric	English	Comments
Carbon, C	0.50 %	0.50 %	
Chromium, Cr	25.5 %	25.5 %	
Cobalt, Co	50 %	50 %	As remainder
Iron, Fe	<= 2.0 %	<= 2.0 %	
Manganese, Mn	<= 1.0 %	<= 1.0 %	
Nickel, Ni	10.5 %	10.5 %	
Other	<= 2.0 %	<= 2.0 %	
Phosphorous, P	<= 0.040 %	<= 0.040 %	
Silicon, Si	<= 1.0 %	<= 1.0 %	
Sulfur, S	<= 0.040 %	<= 0.040 %	
Tungsten, W	7.5 %	7.5 %	

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