Special Metals UDIMET® alloy L-605 Co-Cr-W-Ni Alloy

Category : Metal , Nonferrous Metal , Cobalt Alloy , Superalloy

Material Notes:

UDIMET® alloy L-605 (UNS R30605) is a solid solution strengthened cobalt-chromium-tungsten-nickel alloy with excellent high-temperature strength and excellent oxidation resistance to 2000°F (1093°C). The alloy also offers good resistance to sulfidation and resistance to wear and galling. Alloy L-605 is useful in gas turbine applications such as rings, blades and combustion chamber parts (sheet fabrications) and can also be used in industrial furnace applications such as mufflers or liners in high-temperature kilns.Information Provided by Special Metals Corporation

Order this product through the following link:
http://www.lookpolymers.com/polymer_Special-Metals-UDIMET-alloy-L-605-Co-Cr-W-Ni-Alloy.php

Physical Properties	Metric	English	Comments
Density	9.27 g/cc	0.335 lb/in³	

Mechanical Properties	Metric	English	Comments
Tensile Strength at Break	994 MPa	144000 psi	
	150 MPa @Temperature 1100 °C	21800 psi @Temperature 2010 °F	
	700 MPa @Temperature 650 °C	102000 psi @Temperature 1200 °F	
	900 MPa @Temperature 200 °C	131000 psi @Temperature 392 °F	
Tensile Strength, Yield	466 MPa	67600 psi	
	75.0 MPa @Strain 0.200 %, Temperature 1100 °C	10900 psi @Strain 0.200 %, Temperature 2010 °F	
	225 MPa @Strain 0.200 %, Temperature 650 °C	32600 psi @Strain 0.200 %, Temperature 1200 °F	
	400 MPa @Strain 0.200 %, Temperature 200 °C	58000 psi @Strain 0.200 %, Temperature 392 °F	
Elongation at Break	50 %	50 %	
	35 % @Temperature 650 °C	35 % @Temperature 1200 °F	

Mechanical Properties	Metric	English	Comments
	35 %	35 %	
	@Temperature 1100 °C	@Temperature 2010 °F	
	60 %	60 %	
	@Temperature 200 °C	@Temperature 392 °F	
Rupture Strength	25.0 MPa	3630 psi	
	@Temperature 982 °C, Time 3.60e+6 sec	@Temperature 1800 °F, Time 1000 hour	
	44.0 MPa	6380 psi	
	@Temperature 927 °C, Time 3.60e+6 sec	@Temperature 1700 °F, Time 1000 hour	
	72.0 MPa	10400 psi	
	@Temperature 871 °C, Time 3.60e+6 sec	@Temperature 1600 °F, Time 1000 hour	
	120 MPa	17400 psi	
	@Temperature 816 °C, Time 3.60e+6 sec	@Temperature 1500 °F, Time 1000 hour	
	165 MPa	23900 psi	
	@Temperature 760 °C, Time 3.60e+6 sec	@Temperature 1400 °F, Time 1000 hour	
	220 MPa	31900 psi	
	@Temperature 704 °C, Time 3.60e+6 sec	@Temperature 1300 °F, Time 1000 hour	
	270 MPa	39200 psi	
	@Temperature 649 °C, Time 3.60e+6 sec	@Temperature 1200 °F, Time 1000 hour	

Thermal Properties	Metric	English	Comments
CTE, linear	13.0 µm/m-°C	7.24 µin/in-°F	
	@Temperature 93.3 °C	@Temperature 200 °F	
	13.4 µm/m-°C	7.43 µin/in-°F	
	@Temperature 204 °C	@Temperature 400 °F	
	13.8 µm/m-°C	7.66 µin/in-°F	
	@Temperature 316 °C	@Temperature 600 °F	
	14.2 µm/m-°C	7.89 µin/in-°F	
	@Temperature 427 °C	@Temperature 800 °F	

Thermal Properties	Metric	English	Comments
	@Temperature 538 °C	@Temperature 1000 °F	
	14.9 µm/m-°C @Temperature 649 °C	8.28 µin/in-°F @Temperature 1200 °F	
	15.6 µm/m-°C @Temperature 760 °C	8.68 µin/in-°F @Temperature 1400 °F	
	16.1 µm/m-°C @Temperature 871 °C	8.94 µin/in-°F @Temperature 1600 °F	
Specific Heat Capacity	0.385 J/g-°C @Temperature 21.0 °C	0.0920 BTU/lb-°F @Temperature 69.8 °F	
Thermal Conductivity	9.40 W/m-K	65.2 BTU-in/hr-ft²-°F	
Melting Point	1330 - 1410 °C	2430 - 2570 °F	
Solidus	1330 °C	2430 °F	
Liquidus	1410 °C	2570 °F	

Component Elements Properties	Metric	English	Comments
Carbon, C	0.050 - 0.15 %	0.050 - 0.15 %	
Chromium, Cr	19 - 21 %	19 - 21 %	
Cobalt, Co	46.38 - 56.95 %	46.38 - 56.95 %	Balance
Iron, Fe	<= 3.0 %	<= 3.0 %	
Manganese, Mn	1.0 - 2.0 %	1.0 - 2.0 %	
Nickel, Ni	9.0 - 11 %	9.0 - 11 %	
Phosphorous, P	<= 0.040 %	<= 0.040 %	
Silicon, Si	<= 0.40 %	<= 0.40 %	
Sulfur, S	<= 0.030 %	<= 0.030 %	
Tungsten, W	14 - 16 %	14 - 16 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.00008864 ohm-cm @Temperature 24.0 °C	0.00008864 ohm-cm @Temperature 75.2 °F	

Electrical Properties	Metric	English	Comments
Magnetic Permeability	1.002	1.002	at 200 oersted

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