Haynes 230Â® alloy, 20% cold reduction, 1177Â°C anneal for 5 minutes

Category : Metal , Nonferrous Metal , Nickel Alloy , Superalloy

Material Notes:

Excellent high-temperature strength, outstanding resistance to oxidizing environments up to 1149Â°C, premier resistance to nitriding environments, and excellent long-term thermal stability. Applications include combustion cans, transition ducts, flameholders, thermocouple sheaths and other gas turbine components; used for catalyst grid supports in ammonia burners, high-strength thermocouple protection tubes, high-temperature heat exchangers, ducts, high-temperature bellows; furnace retorts, chains and fixtures, burner flame shrouds, recuperator internals, dampers, nitriding furnace internals, heat-treating baskets, grates, trays, sparger tubes, and cyclone internals.Data provided by the manufacturer, Haynes International, Inc.

Order this product through the following link:
http://www.lookpolymers.com/polymer_Haynes-230-alloy-20-cold-reduction-1177C-anneal-for-5-minutes.php

Physical Properties	Metric	English	Comments
Density	8.97 g/cc	0.324 lb/inÂ³	at RT

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	925 MPa	134000 psi	
Tensile Strength, Yield	445 MPa @Strain 0.200 %	64500 psi @Strain 0.200 %	
Elongation at Break	40.1 %	40.1 %	in 50.8 mm
Modulus of Elasticity	211 GPa	30600 ksi	RT
	150 GPa @Temperature 1000 Â°C	21800 ksi @Temperature 1830 Â°F	
	157 GPa @Temperature 900 Â°C	22800 ksi @Temperature 1650 Â°F	
	164 GPa @Temperature 800 Â°C	23800 ksi @Temperature 1470 Â°F	
	171 GPa @Temperature 700 Â°C	24800 ksi @Temperature 1290 Â°F	
	177 GPa @Temperature 600 Â°C	25700 ksi @Temperature 1110 Â°F	

Mechanical Properties	Metric	English	Comments
	@Temperature 500 Â°C	@Temperature 932 Â°F	
	190 GPa @Temperature 400 Â°C	27600 ksi @Temperature 752 Â°F	
	196 GPa @Temperature 300 Â°C	28400 ksi @Temperature 572 Â°F	
	202 GPa @Temperature 200 Â°C	29300 ksi @Temperature 392 Â°F	
	207 GPa @Temperature 100 Â°C	30000 ksi @Temperature 212 Â°F	
Charpy Impact	73.0 J	53.8 ft-lb	solution annealed (unknown temp)

Thermal Properties	Metric	English	Comments
CTE, linear	12.7 Âµm/m-Â°C @Temperature 25.0 - 100 Â°C	7.06 Âµin/in-Â°F @Temperature 77.0 - 212 Â°F	
	13.0 Âµm/m-Â°C @Temperature 25.0 - 200 Â°C	7.22 Âµin/in-Â°F @Temperature 77.0 - 392 Â°F	
	13.3 Âµm/m-Â°C @Temperature 25.0 - 300 Â°C	7.39 Âµin/in-Â°F @Temperature 77.0 - 572 Â°F	
	13.7 Âµm/m-Â°C @Temperature 25.0 - 400 Â°C	7.61 Âµin/in-Â°F @Temperature 77.0 - 752 Â°F	
	14.0 Âµm/m-Â°C @Temperature 25.0 - 500 Â°C	7.78 Âµin/in-Â°F @Temperature 77.0 - 932 Â°F	
	14.4 Âµm/m-Â°C @Temperature 25.0 - 600 Â°C	8.00 Âµin/in-Â°F @Temperature 77.0 - 1110 Â°F	
	14.8 Âµm/m-Â°C @Temperature 25.0 - 700 Â°C	8.22 Âµin/in-Â°F @Temperature 77.0 - 1290 Â°F	
	15.2 Âµm/m-Â°C	8.44 Âµin/in-Â°F	

Thermal Properties	Metric	English	Comments
	@Temperature 25.0 - 800 Â°C	@Temperature 77.0 - 1470 Â°F	
	15.7 Âµm/m-Â°C @Temperature 25.0 - 900 Â°C	8.72 Âµin/in-Â°F @Temperature 77.0 - 1650 Â°F	
	16.1 Âµm/m-Â°C @Temperature 25.0 - 1000 Â°C	8.94 Âµin/in-Â°F @Temperature 77.0 - 1830 Â°F	
Specific Heat Capacity	0.397 J/g-Â°C	0.0949 BTU/lb-Â°F	RT
	0.419 J/g-Â°C @Temperature 100 Â°C	0.100 BTU/lb-Â°F @Temperature 212 Â°F	
	0.435 J/g-Â°C @Temperature 200 Â°C	0.104 BTU/lb-Â°F @Temperature 392 Â°F	
	0.448 J/g-Â°C @Temperature 300 Â°C	0.107 BTU/lb-Â°F @Temperature 572 Â°F	
	0.465 J/g-Â°C @Temperature 400 Â°C	0.111 BTU/lb-Â°F @Temperature 752 Â°F	
	0.473 J/g-Â°C @Temperature 500 Â°C	0.113 BTU/lb-Â°F @Temperature 932 Â°F	
	0.486 J/g-Â°C @Temperature 600 Â°C	0.116 BTU/lb-Â°F @Temperature 1110 Â°F	
	0.574 J/g-Â°C @Temperature 700 Â°C	0.137 BTU/lb-Â°F @Temperature 1290 Â°F	
	0.595 J/g-Â°C @Temperature 800 Â°C	0.142 BTU/lb-Â°F @Temperature 1470 Â°F	
	0.609 J/g-Â°C @Temperature 900 Â°C	0.146 BTU/lb-Â°F @Temperature 1650 Â°F	
	0.617 J/g-Â°C @Temperature 1000 Â°C	0.147 BTU/lb-Â°F @Temperature 1830 Â°F	
Thermal Conductivity	8.90 W/m-K	61.8 BTU-in/hr-ftÂ²-Â°F	RT

Thermal Properties	Metric	English	Comments
	10.4 W/m-K @Temperature 100 Â°C	72.1 BTU-in/hr-ftÂ²-Â°F @Temperature 212 Â°F	
	12.4 W/m-K @Temperature 200 Â°C	86.1 BTU-in/hr-ftÂ²-Â°F @Temperature 392 Â°F	
	14.4 W/m-K @Temperature 300 Â°C	99.9 BTU-in/hr-ftÂ²-Â°F @Temperature 572 Â°F	
	16.4 W/m-K @Temperature 400 Â°C	114 BTU-in/hr-ftÂ²-Â°F @Temperature 752 Â°F	
	18.4 W/m-K @Temperature 500 Â°C	128 BTU-in/hr-ftÂ²-Â°F @Temperature 932 Â°F	
	20.4 W/m-K @Temperature 600 Â°C	142 BTU-in/hr-ftÂ²-Â°F @Temperature 1110 Â°F	
	22.4 W/m-K @Temperature 700 Â°C	155 BTU-in/hr-ftÂ²-Â°F @Temperature 1290 Â°F	
	24.4 W/m-K @Temperature 800 Â°C	169 BTU-in/hr-ftÂ²-Â°F @Temperature 1470 Â°F	
	26.4 W/m-K @Temperature 900 Â°C	183 BTU-in/hr-ftÂ²-Â°F @Temperature 1650 Â°F	
	28.4 W/m-K @Temperature 1000 Â°C	197 BTU-in/hr-ftÂ²-Â°F @Temperature 1830 Â°F	
Melting Point	1301 - 1371 Â°C	2374 - 2500 Â°F	
Solidus	1301 Â°C	2374 Â°F	
Liquidus	1371 Â°C	2500 Â°F	

Component Elements Properties	Metric	English	Comments
Aluminum, Al	0.30 %	0.30 %	
Boron, B	<= 0.015 %	<= 0.015 %	

Component Elements Properties	Metric	English	Comments
Carbon, C	0.10 %	0.10 %	
Chromium, Cr	22 %	22 %	
Cobalt, Co	<= 5.0 %	<= 5.0 %	
Iron, Fe	<= 3.0 %	<= 3.0 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.000125 ohm-cm	0.000125 ohm-cm	RT
	0.000125 ohm-cm @Temperature 1000 Â°C	0.000125 ohm-cm @Temperature 1830 Â°F	
	0.0001258 ohm-cm @Temperature 100 Â°C	0.0001258 ohm-cm @Temperature 212 Â°F	
	0.0001265 ohm-cm @Temperature 200 Â°C	0.0001265 ohm-cm @Temperature 392 Â°F	
	0.0001271 ohm-cm @Temperature 900 Â°C	0.0001271 ohm-cm @Temperature 1650 Â°F	
	0.0001273 ohm-cm @Temperature 300 Â°C	0.0001273 ohm-cm @Temperature 572 Â°F	
	0.0001284 ohm-cm @Temperature 400 Â°C	0.0001284 ohm-cm @Temperature 752 Â°F	
	0.0001291 ohm-cm @Temperature 800 Â°C	0.0001291 ohm-cm @Temperature 1470 Â°F	
	0.0001302 ohm-cm @Temperature 500 Â°C	0.0001302 ohm-cm @Temperature 932 Â°F	
	0.0001307 ohm-cm @Temperature 700 Â°C	0.0001307 ohm-cm @Temperature 1290 Â°F	
	0.0001312 ohm-cm @Temperature 600 Â°C	0.0001312 ohm-cm @Temperature 1110 Â°F	

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