

Haynes 188 alloy, cold rolled and 1175°C solution annealed sheet

Category : Metal , Nonferrous Metal , Cobalt Alloy , Superalloy

Material Notes:

Excellent high temperature strength and very good resistance to oxidizing environments up to 1095°C for prolonged exposure, and excellent resistance to sulfate deposit hot corrosion. Readily fabricated and formed, excellent resistance to molten chloride salts, and good resistance to gaseous sulfidation. Applications include a variety of fabricated component applications in the aerospace industry, commercial gas turbine engines for combustion cans, transition ducts and afterburner components. Data provided by the manufacturer, Haynes International, Inc.

Order this product through the following link:

http://www.lookpolymers.com/polymer_Haynes-188-alloy-cold-rolled-and-1175C-solution-annealed-sheet.php

Physical Properties	Metric	English	Comments
Density	8.98 g/cc	0.324 lb/in ³	at RT.

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	945 MPa	137000 psi	
	130 MPa	18900 psi	
	@Temperature 1095 °C	@Temperature 2003 °F	
	245 MPa	35500 psi	
	@Temperature 980 °C	@Temperature 1800 °F	
	415 MPa	60200 psi	
	@Temperature 870 °C	@Temperature 1600 °F	
Tensile Strength, Yield	620 MPa	89900 psi	
	@Temperature 760 °C	@Temperature 1400 °F	
	710 MPa	103000 psi	
	@Temperature 650 °C	@Temperature 1200 °F	
	750 MPa	109000 psi	
	@Temperature 540 °C	@Temperature 1000 °F	
	465 MPa	67400 psi	
@Strain 0.200 %	@Strain 0.200 %		
	64.0 MPa	9280 psi	

Mechanical Properties	Metric	English	Comments
	@Strain 0.200 %, Temperature 1095 Å°C	@Strain 0.200 %, Temperature 2003 Å°F	
	130 MPa	18900 psi	
	@Strain 0.200 %, Temperature 980 Å°C	@Strain 0.200 %, Temperature 1800 Å°F	
	250 MPa	36300 psi	
	@Strain 0.200 %, Temperature 870 Å°C	@Strain 0.200 %, Temperature 1600 Å°F	
	270 MPa	39200 psi	
	@Strain 0.200 %, Temperature 760 Å°C	@Strain 0.200 %, Temperature 1400 Å°F	
	275 MPa	39900 psi	
	@Strain 0.200 %, Temperature 650 Å°C	@Strain 0.200 %, Temperature 1200 Å°F	
	290 MPa	42100 psi	
	@Strain 0.200 %, Temperature 540 Å°C	@Strain 0.200 %, Temperature 1000 Å°F	
Elongation at Break	53 %	53 %	in 51 mm
	32 %	32 %	in 51 mm
	@Temperature 1095 Å°C	@Temperature 2003 Å°F	
	59 %	59 %	in 51 mm
	@Temperature 650 Å°C	@Temperature 1200 Å°F	
	59 %	59 %	in 51 mm
	@Temperature 980 Å°C	@Temperature 1800 Å°F	
	61 %	61 %	in 51 mm
	@Temperature 540 Å°C	@Temperature 1000 Å°F	
	63 %	63 %	in 51 mm
	@Temperature 760 Å°C	@Temperature 1400 Å°F	
	64 %	64 %	in 51 mm
	@Temperature 870 Å°C	@Temperature 1600 Å°F	
Modulus of Elasticity	232 GPa	33600 ksi	RT

Mechanical Properties	Metric	English	Comments
	@Temperature 1000 Â°C	@Temperature 1830 Â°F	
	161 GPa	23400 ksi	
	@Temperature 900 Â°C	@Temperature 1650 Â°F	
	169 GPa	24500 ksi	
	@Temperature 800 Â°C	@Temperature 1470 Â°F	
	176 GPa	25500 ksi	
	@Temperature 700 Â°C	@Temperature 1290 Â°F	
	184 GPa	26700 ksi	
	@Temperature 600 Â°C	@Temperature 1110 Â°F	
	193 GPa	28000 ksi	
	@Temperature 500 Â°C	@Temperature 932 Â°F	
	201 GPa	29200 ksi	
	@Temperature 400 Â°C	@Temperature 752 Â°F	
	209 GPa	30300 ksi	
	@Temperature 300 Â°C	@Temperature 572 Â°F	
	217 GPa	31500 ksi	
	@Temperature 200 Â°C	@Temperature 392 Â°F	
	225 GPa	32600 ksi	
	@Temperature 100 Â°C	@Temperature 212 Â°F	
Charpy Impact	194 J	143 ft-lb	solution annealed

Thermal Properties	Metric	English	Comments
CTE, linear	11.9 Âµm/m-Â°C	6.61 Âµin/in-Â°F	
	@Temperature 25.0 - 100 Â°C	@Temperature 77.0 - 212 Â°F	
	12.6 Âµm/m-Â°C	7.00 Âµin/in-Â°F	
	@Temperature 25.0 - 200 Â°C	@Temperature 77.0 - 392 Â°F	
	13.2 Âµm/m-Â°C	7.33 Âµin/in-Â°F	

Thermal Properties	Metric @Temperature 25.0 - 300 Â°C	English @Temperature 77.0 - 572 Â°F	Comments
	13.8 Âµm/m-Â°C	7.67 Âµin/in-Â°F	
	@Temperature 25.0 - 400 Â°C	@Temperature 77.0 - 752 Â°F	
	14.5 Âµm/m-Â°C	8.06 Âµin/in-Â°F	
	@Temperature 25.0 - 500 Â°C	@Temperature 77.0 - 932 Â°F	
	15.2 Âµm/m-Â°C	8.44 Âµin/in-Â°F	
	@Temperature 25.0 - 600 Â°C	@Temperature 77.0 - 1110 Â°F	
	15.8 Âµm/m-Â°C	8.78 Âµin/in-Â°F	
	@Temperature 25.0 - 700 Â°C	@Temperature 77.0 - 1290 Â°F	
	16.5 Âµm/m-Â°C	9.17 Âµin/in-Â°F	
	@Temperature 25.0 - 800 Â°C	@Temperature 77.0 - 1470 Â°F	
	17.1 Âµm/m-Â°C	9.50 Âµin/in-Â°F	
	@Temperature 25.0 - 800 Â°C	@Temperature 77.0 - 1470 Â°F	
	17.9 Âµm/m-Â°C	9.94 Âµin/in-Â°F	
	@Temperature 25.0 - 1000 Â°C	@Temperature 77.0 - 1830 Â°F	
Specific Heat Capacity	0.403 J/g-Â°C	0.0963 BTU/lb-Â°F	RT
	0.423 J/g-Â°C	0.101 BTU/lb-Â°F	
	@Temperature 100 Â°C	@Temperature 212 Â°F	
	0.444 J/g-Â°C	0.106 BTU/lb-Â°F	
	@Temperature 200 Â°C	@Temperature 392 Â°F	
	0.465 J/g-Â°C	0.111 BTU/lb-Â°F	
	@Temperature 300 Â°C	@Temperature 572 Â°F	
	0.486 J/g-Â°C	0.116 BTU/lb-Â°F	
	@Temperature 400 Â°C	@Temperature 752 Â°F	
	0.502 J/g-Â°C	0.120 BTU/lb-Â°F	
	@Temperature 500 Â°C	@Temperature 932 Â°F	
	0.523 J/g-Â°C	0.125 BTU/lb-Â°F	

Thermal Properties	Metric	English	Comments
	0.540 J/g-Â°C	0.129 BTU/lb-Â°F	
	@Temperature 600 Â°C	@Temperature 1110 Â°F	
	0.557 J/g-Â°C	0.133 BTU/lb-Â°F	
	@Temperature 700 Â°C	@Temperature 1290 Â°F	
	0.573 J/g-Â°C	0.137 BTU/lb-Â°F	
	@Temperature 800 Â°C	@Temperature 1470 Â°F	
	0.590 J/g-Â°C	0.141 BTU/lb-Â°F	
	@Temperature 900 Â°C	@Temperature 1650 Â°F	
	0.590 J/g-Â°C	0.141 BTU/lb-Â°F	
	@Temperature 1000 Â°C	@Temperature 1830 Â°F	
Thermal Conductivity	10.4 W/m-K	72.2 BTU-in/hr-ftÂ²-Â°F	RT

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.000101 ohm-cm	0.000101 ohm-cm	RT
	0.000103 ohm-cm	0.000103 ohm-cm	
	@Temperature 100 Â°C	@Temperature 212 Â°F	
	0.000105 ohm-cm	0.000105 ohm-cm	
	@Temperature 200 Â°C	@Temperature 392 Â°F	
	0.0001077 ohm-cm	0.0001077 ohm-cm	
	@Temperature 300 Â°C	@Temperature 572 Â°F	
	0.0001105 ohm-cm	0.0001105 ohm-cm	
	@Temperature 400 Â°C	@Temperature 752 Â°F	
	0.0001127 ohm-cm	0.0001127 ohm-cm	
	@Temperature 500 Â°C	@Temperature 932 Â°F	
	0.0001148 ohm-cm	0.0001148 ohm-cm	
	@Temperature 600 Â°C	@Temperature 1110 Â°F	
	0.0001164 ohm-cm	0.0001164 ohm-cm	
	@Temperature 700 Â°C	@Temperature 1290 Â°F	
	0.0001175 ohm-cm	0.0001175 ohm-cm	

Electrical Properties	Metric	English	Comments
	@Temperature 800 Â°C	@Temperature 1470 Â°F	
	0.0001183 ohm-cm	0.0001183 ohm-cm	
	@Temperature 900 Â°C	@Temperature 1650 Â°F	
	0.0001191 ohm-cm	0.0001191 ohm-cm	
	@Temperature 1000 Â°C	@Temperature 1830 Â°F	

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