Haynes UltimetÂ® alloy, plate, GMAW weld (spray)

Category : Metal , Nonferrous Metal , Cobalt Alloy , Superalloy

Material Notes:

Co content as balance, excellent corrosion resistance, outstanding wear resistance, high tensile strength combined with excellent impact toughness and ductility. Ideal welding material with exceptional ductility and resistance to weld cracking, very easy to apply as an overlay, multiple layers appliable with little to no preheat. Applications include agitators, blenders, bolts, dies, extruders, fan blades, filters, glass plungers, nozzles, pumps, rolls, screw conveyors, and valve parts.Data provided by the manufacturer, Haynes International, Inc.

Order this product through the following link:
http://www.lookpolymers.com/polymer_Haynes-Ultimet-alloy-plate-GMAW-weld-spray.php

Physical Properties	Metric	English	Comments
Density	8.47 g/cc	0.306 lb/inÂ³	

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	779 MPa @Thickness 12.7 mm, Temperature 538 Â°C	113000 psi @Thickness 0.500 in, Temperature 1000 Â°F	
	779 MPa @Thickness 19.0 mm, Temperature 538 Â°C	113000 psi @Thickness 0.750 in, Temperature 1000 Â°F	
	834 MPa @Thickness 12.7 mm, Temperature 260 Â°C	121000 psi @Thickness 0.500 in, Temperature 500 Â°F	
	834 MPa @Thickness 19.0 mm, Temperature 260 Â°C	121000 psi @Thickness 0.750 in, Temperature 500 Â°F	
	917 MPa @Thickness 12.7 mm, Temperature 20.0 Â°C	133000 psi @Thickness 0.500 in, Temperature 68.0 Â°F	
	938 MPa @Thickness 19.0 mm, Temperature 20.0 Â°C	136000 psi @Thickness 0.750 in, Temperature 68.0 Â°F	
Tensile Strength, Yield	345 MPa @Thickness 19.0 mm, Temperature 538 Â°C	50000 psi @Thickness 0.750 in, Temperature 1000 Â°F	0.2% offset
	441 MPa @Thickness 19.0 mm, Temperature 260 Â°C	64000 psi @Thickness 0.750 in, Temperature 500 Â°F	0.2% offset

Mechanical Properties	Metric	English	Comments
	448 MPa @Thickness 12.7 mm, Temperature 538 Â°C	65000 psi @Thickness 0.500 in, Temperature 1000 Â°F	0.2% offset
	462 MPa @Thickness 12.7 mm, Temperature 260 Â°C	67000 psi @Thickness 0.500 in, Temperature 500 Â°F	0.2% offset
	621 MPa @Thickness 19.0 mm, Temperature 20.0 Â°C	90100 psi @Thickness 0.750 in, Temperature 68.0 Â°F	0.2% offset
	641 MPa @Thickness 12.7 mm, Temperature 20.0 Â°C	93000 psi @Thickness 0.500 in, Temperature 68.0 Â°F	0.2% offset
Elongation at Break	11 % @Thickness 12.7 mm, Temperature 20.0 Â°C	11 % @Thickness 0.500 in, Temperature 68.0 Â°F	in 50.8 mm
	15 % @Thickness 19.0 mm, Temperature 20.0 Â°C	15 % @Thickness 0.750 in, Temperature 68.0 Â°F	in 50.8 mm
	19 % @Thickness 12.7 mm, Temperature 260 Â°C	19 % @Thickness 0.500 in, Temperature 500 Â°F	in 50.8 mm
	23 % @Thickness 19.0 mm, Temperature 260 Â°C	23 % @Thickness 0.750 in, Temperature 500 Â°F	in 50.8 mm
	30 % @Thickness 12.7 mm, Temperature 538 Â°C	30 % @Thickness 0.500 in, Temperature 1000 Â°F	in 50.8 mm
	32 % @Thickness 19.0 mm, Temperature 538 Â°C	32 % @Thickness 0.750 in, Temperature 1000 Â°F	in 50.8 mm
Modulus of Elasticity	180 GPa @Temperature 649 Â°C	26100 ksi @Temperature 1200 Â°F	(heat treated at 1121Â°C (2050Â°F), water quenched plate)
	189 GPa @Temperature 538 Â°C	27400 ksi @Temperature 1000 Â°F	(heat treated at 1121Â°C (2050Â°F), water quenched plate)
	197 GPa	28600 ksi	(heat treated at 1121Â°C (2050Â°F), water quenched plate)

Mechanical Properties	Metric	English	Comments
	@Temperature 427 Â°C	@Temperature 801 Â°F	
	206 GPa @Temperature 316 Â°C	29900 ksi @Temperature 601 Â°F	(heat treated at 1121Â°C (2050Â°F), water quenched plate)
	215 GPa @Temperature 204 Â°C	31200 ksi @Temperature 399 Â°F	(heat treated at 1121Â°C (2050Â°F), water quenched plate)
Charpy Impact	127 J	93.7 ft-lb	V Notch

Thermal Properties	Metric	English	Comments
CTE, linear	14.0 Âµm/m-Â°C @Temperature 26.0 - 316 Â°C	7.78 Âµin/in-Â°F @Temperature 78.8 - 601 Â°F	
	14.5 Âµm/m-Â°C @Temperature 26.0 - 427 Â°C	8.06 Âµin/in-Â°F @Temperature 78.8 - 801 Â°F	
	14.8 Âµm/m-Â°C @Temperature 26.0 - 538 Â°C	8.22 Âµin/in-Â°F @Temperature 78.8 - 1000 Â°F	
	15.1 Âµm/m-Â°C @Temperature 26.0 - 649 Â°C	8.39 Âµin/in-Â°F @Temperature 78.8 - 1200 Â°F	
	15.9 Âµm/m-Â°C @Temperature 26.0 - 760 Â°C	8.83 Âµin/in-Â°F @Temperature 78.8 - 1400 Â°F	
	16.4 Âµm/m-Â°C @Temperature 26.0 - 871 Â°C	9.11 Âµin/in-Â°F @Temperature 78.8 - 1600 Â°F	
	16.9 Âµm/m-Â°C @Temperature 26.0 - 982 Â°C	9.39 Âµin/in-Â°F @Temperature 78.8 - 1800 Â°F	
Specific Heat Capacity	0.456 J/g-Â°C @Temperature 23.0 Â°C	0.109 BTU/lb-Â°F @Temperature 73.4 Â°F	
	0.470 J/g-Â°C @Temperature 100 Â°C	0.112 BTU/lb-Â°F @Temperature 212 Â°F	
	0.482 J/g-Â°C @Temperature 200 Â°C	0.115 BTU/lb-Â°F @Temperature 392 Â°F	

Thermal Properties	Metric	English	Comments
	@Temperature 300 Â°C	@Temperature 572 Â°F	
	0.525 J/g-Â°C @Temperature 400 Â°C	0.125 BTU/lb-Â°F @Temperature 752 Â°F	
	0.545 J/g-Â°C @Temperature 500 Â°C	0.130 BTU/lb-Â°F @Temperature 932 Â°F	
	0.573 J/g-Â°C @Temperature 600 Â°C	0.137 BTU/lb-Â°F @Temperature 1110 Â°F	
Thermal Conductivity	12.3 W/m-K @Temperature 23.0 Â°C	85.4 BTU-in/hr-ftÂ²-Â°F @Temperature 73.4 Â°F	
	13.8 W/m-K @Temperature 100 Â°C	95.8 BTU-in/hr-ftÂ²-Â°F @Temperature 212 Â°F	
	15.6 W/m-K @Temperature 200 Â°C	108 BTU-in/hr-ftÂ²-Â°F @Temperature 392 Â°F	
	17.5 W/m-K @Temperature 300 Â°C	121 BTU-in/hr-ftÂ²-Â°F @Temperature 572 Â°F	
	19.4 W/m-K @Temperature 400 Â°C	135 BTU-in/hr-ftÂ²-Â°F @Temperature 752 Â°F	
	21.5 W/m-K @Temperature 500 Â°C	149 BTU-in/hr-ftÂ²-Â°F @Temperature 932 Â°F	
	23.9 W/m-K @Temperature 600 Â°C	166 BTU-in/hr-ftÂ²-Â°F @Temperature 1110 Â°F	
Melting Point	1332 - 1354 Â°C	2430 - 2469 Â°F	
Solidus	1332 Â°C	2430 Â°F	
Liquidus	1354 Â°C	2469 Â°F	

Component Elements Properties	Metric	English	Comments
Carbon, C	0.060 %	0.060 %	
Chromium, Cr	26 %	26 %	

Component Elements Properties	Metric	English	Comments
Iron, Fe	3.0 %	3.0 %	
Manganese, Mn	0.80 %	0.80 %	
Molybdenum, Mo	5.0 %	5.0 %	
Nickel, Ni	9.0 %	9.0 %	
Nitrogen, N	0.080 %	0.080 %	
Silicon, Si	0.30 %	0.30 %	
Tungsten, W	2.0 %	2.0 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000870 ohm-cm @Temperature 23.0 Â°C	0.0000870 ohm-cm @Temperature 73.4 Â°F	
	0.0000890 ohm-cm @Temperature 100 Â°C	0.0000890 ohm-cm @Temperature 212 Â°F	
	0.0000930 ohm-cm @Temperature 200 Â°C	0.0000930 ohm-cm @Temperature 392 Â°F	
	0.0000960 ohm-cm @Temperature 300 Â°C	0.0000960 ohm-cm @Temperature 572 Â°F	
	0.000100 ohm-cm @Temperature 400 Â°C	0.000100 ohm-cm @Temperature 752 Â°F	
	0.000103 ohm-cm @Temperature 500 Â°C	0.000103 ohm-cm @Temperature 932 Â°F	
	0.000105 ohm-cm @Temperature 600 Â°C	0.000105 ohm-cm @Temperature 1110 Â°F	

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