

Haynes Ultimet® alloy, 19.1 mm thick plate, SMAW weld

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 applicable 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-191-mm-thick-plate-SMAW-weld.php

Physical Properties	Metric	English	Comments
Density	8.47 g/cc	0.306 lb/in ³	

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	896 MPa	130000 psi	
	752 MPa @Temperature 538 Å°C	109000 psi @Temperature 1000 Å°F	
Tensile Strength, Yield	600 MPa @Strain 0.200 %	87000 psi @Strain 0.200 %	
	331 MPa @Strain 0.200 %, Temperature 538 Å°C	48000 psi @Strain 0.200 %, Temperature 1000 Å°F	
Elongation at Break	13 %	13 %	in 50.8 mm
	32 % @Temperature 538 Å°C	32 % @Temperature 1000 Å°F	in 50.8 mm
Modulus of Elasticity	180 GPa @Temperature 649 Å°C	26100 ksi @Temperature 1200 Å°F	(heat treated at 1121Å°C (2050Å°F), water quenched plate)
	189 GPa @Temperature 538 Å°C	27400 ksi @Temperature 1000 Å°F	(heat treated at 1121Å°C (2050Å°F), water quenched plate)
	197 GPa @Temperature 427 Å°C	28600 ksi @Temperature 801 Å°F	(heat treated at 1121Å°C (2050Å°F), water quenched plate)
	206 GPa	29900 ksi	

Mechanical Properties	Metric @Temperature 316 Â°C	English @Temperature 601 Â°F	Comments (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 @Temperature 23.0 Â°C	93.7 ft-lb @Temperature 73.4 Â°F	

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	0.504 J/g-Â°C Metric	0.120 BTU/lb-Â°F English	Comments
	@Temperature 300 Â°C	@Temperature 572 Â°F	
	0.525 J/g-Â°C	0.125 BTU/lb-Â°F	
	@Temperature 400 Â°C	@Temperature 752 Â°F	
	0.545 J/g-Â°C	0.130 BTU/lb-Â°F	
	@Temperature 500 Â°C	@Temperature 932 Â°F	
	0.573 J/g-Â°C	0.137 BTU/lb-Â°F	
	@Temperature 600 Â°C	@Temperature 1110 Â°F	
Thermal Conductivity	12.3 W/m-K	85.4 BTU-in/hr-ftÂ²- Â°F	
	@Temperature 23.0 Â°C	@Temperature 73.4 Â°F	
	13.8 W/m-K	95.8 BTU-in/hr-ftÂ²- Â°F	
	@Temperature 100 Â°C	@Temperature 212 Â°F	
	15.6 W/m-K	108 BTU-in/hr-ftÂ²-Â°F	
	@Temperature 200 Â°C	@Temperature 392 Â°F	
	17.5 W/m-K	121 BTU-in/hr-ftÂ²-Â°F	
	@Temperature 300 Â°C	@Temperature 572 Â°F	
	19.4 W/m-K	135 BTU-in/hr-ftÂ²-Â°F	
	@Temperature 400 Â°C	@Temperature 752 Â°F	
	21.5 W/m-K	149 BTU-in/hr-ftÂ²-Â°F	
	@Temperature 500 Â°C	@Temperature 932 Â°F	
	23.9 W/m-K	166 BTU-in/hr-ftÂ²-Â°F	
	@Temperature 600 Â°C	@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	0.0000870 ohm-cm	
	@Temperature 23.0 Â°C	@Temperature 73.4 Â°F	
	0.0000890 ohm-cm	0.0000890 ohm-cm	
	@Temperature 100 Â°C	@Temperature 212 Â°F	
	0.0000930 ohm-cm	0.0000930 ohm-cm	
	@Temperature 200 Â°C	@Temperature 392 Â°F	
	0.0000960 ohm-cm	0.0000960 ohm-cm	
	@Temperature 300 Â°C	@Temperature 572 Â°F	
0.000100 ohm-cm	0.000100 ohm-cm		
@Temperature 400 Â°C	@Temperature 752 Â°F		
0.000103 ohm-cm	0.000103 ohm-cm		
@Temperature 500 Â°C	@Temperature 932 Â°F		
0.000105 ohm-cm	0.000105 ohm-cm		
@Temperature 600 Â°C	@Temperature 1110 Â°F		

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