

## Haynes 625 alloy, plate after 4000 hours at 870Â°C (1600Â°F)

Category : Metal , Nonferrous Metal , Nickel Alloy , Superalloy

### Material Notes:

Cb and Ta content 3.7% combined. Excellent strength up to 816Â°C, good oxidation resistance and aqueous corrosion, excellent forming and welding characteristics. Applications include a variety of high-temperature aerospace, chemical process industry and power industry uses. Widely used in sea water and power plant scrubber applications. Data provided by the manufacturer, Haynes International, Inc.

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[http://www.lookpolymers.com/polymer\\_Haynes-625-alloy-plate-after-4000-hours-at-870C-1600F.php](http://www.lookpolymers.com/polymer_Haynes-625-alloy-plate-after-4000-hours-at-870C-1600F.php)

Physical Properties	Metric	English	Comments
Density	8.44 g/cc	0.305 lb/inÂ³	at RT

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	895 MPa	130000 psi	
Tensile Strength, Yield	460 MPa @Strain 0.200 %	66700 psi @Strain 0.200 %	
Elongation at Break	29 %	29 %	in 50.8 mm
Modulus of Elasticity	208 GPa	30200 ksi	RT
	126 GPa @Temperature 1000 Â°C	18300 ksi @Temperature 1830 Â°F	
	142 GPa @Temperature 900 Â°C	20600 ksi @Temperature 1650 Â°F	
	153 GPa @Temperature 800 Â°C	22200 ksi @Temperature 1470 Â°F	
	163 GPa @Temperature 700 Â°C	23600 ksi @Temperature 1290 Â°F	
	171 GPa @Temperature 600 Â°C	24800 ksi @Temperature 1110 Â°F	
	179 GPa @Temperature 500 Â°C	26000 ksi @Temperature 932 Â°F	

Mechanical Properties	186 GPa Metric	27000 ksi English	Comments
	@Temperature 400 Â°C	@Temperature 752 Â°F	
	192 GPa	27800 ksi	
	@Temperature 300 Â°C	@Temperature 572 Â°F	
	199 GPa	28900 ksi	
	@Temperature 200 Â°C	@Temperature 392 Â°F	
	201 GPa	29200 ksi	
	@Temperature 100 Â°C	@Temperature 212 Â°F	
Charpy Impact	15.0 J	11.1 ft-lb	

Thermal Properties	Metric	English	Comments
CTE, linear	12.8 Âµm/m-Â°C	7.11 Âµin/in-Â°F	
	@Temperature 25.0 - 100 Â°C	@Temperature 77.0 - 212 Â°F	
	13.1 Âµm/m-Â°C	7.28 Âµin/in-Â°F	
	@Temperature 25.0 - 200 Â°C	@Temperature 77.0 - 392 Â°F	
	13.4 Âµm/m-Â°C	7.44 Âµin/in-Â°F	
	@Temperature 25.0 - 300 Â°C	@Temperature 77.0 - 572 Â°F	
	13.8 Âµm/m-Â°C	7.67 Âµin/in-Â°F	
	@Temperature 25.0 - 400 Â°C	@Temperature 77.0 - 752 Â°F	
	14.2 Âµm/m-Â°C	7.89 Âµin/in-Â°F	
	@Temperature 25.0 - 500 Â°C	@Temperature 77.0 - 932 Â°F	
	14.8 Âµm/m-Â°C	8.22 Âµin/in-Â°F	
	@Temperature 25.0 - 600 Â°C	@Temperature 77.0 - 1110 Â°F	
	15.4 Âµm/m-Â°C	8.56 Âµin/in-Â°F	
	@Temperature 25.0 - 700 Â°C	@Temperature 77.0 - 1290 Â°F	
	16.0 Âµm/m-Â°C	8.89 Âµin/in-Â°F	
	@Temperature 25.0 - 800 Â°C	@Temperature 77.0 - 1470 Â°F	
	16.7 Âµm/m-Â°C	9.28 Âµin/in-Â°F	

Thermal Properties	Metric @ Temperature 25.0 - 900 Â°C	English @ Temperature 77.0 - 1650 Â°F	Comments
	17.4 Âµm/m-Â°C	9.67 Âµin/in-Â°F	
	@Temperature 25.0 - 1000 Â°C	@Temperature 77.0 - 1830 Â°F	
<b>Specific Heat Capacity</b>	<b>0.410 J/g-Â°C</b>	<b>0.0980 BTU/lb-Â°F</b>	<b>RT</b>
	0.428 J/g-Â°C	0.102 BTU/lb-Â°F	
	@Temperature 100 Â°C	@Temperature 212 Â°F	
	0.455 J/g-Â°C	0.109 BTU/lb-Â°F	
	@Temperature 200 Â°C	@Temperature 392 Â°F	
	0.477 J/g-Â°C	0.114 BTU/lb-Â°F	
	@Temperature 300 Â°C	@Temperature 572 Â°F	
	0.503 J/g-Â°C	0.120 BTU/lb-Â°F	
	@Temperature 400 Â°C	@Temperature 752 Â°F	
	0.527 J/g-Â°C	0.126 BTU/lb-Â°F	
	@Temperature 500 Â°C	@Temperature 932 Â°F	
	0.552 J/g-Â°C	0.132 BTU/lb-Â°F	
	@Temperature 600 Â°C	@Temperature 1110 Â°F	
	0.576 J/g-Â°C	0.138 BTU/lb-Â°F	
	@Temperature 700 Â°C	@Temperature 1290 Â°F	
	0.600 J/g-Â°C	0.143 BTU/lb-Â°F	
	@Temperature 800 Â°C	@Temperature 1470 Â°F	
	0.625 J/g-Â°C	0.149 BTU/lb-Â°F	
	@Temperature 900 Â°C	@Temperature 1650 Â°F	
	0.648 J/g-Â°C	0.155 BTU/lb-Â°F	
	@Temperature 1000 Â°C	@Temperature 1830 Â°F	
<b>Thermal Conductivity</b>	<b>9.80 W/m-K</b>	<b>68.0 BTU-in/hr-ftÂ²- Â°F</b>	<b>RT</b>
	10.9 W/m-K	75.6 BTU-in/hr-ftÂ²- Â°F	
	@Temperature 100 Â°C		

Thermal Properties	Metric	English	Comments
	12.5 W/m-K	@Temperature 212 Â°F 36.3 BTU-in/hr-ftÂ²-Â°F	
	@Temperature 200 Â°C	@Temperature 392 Â°F	
	13.9 W/m-K	96.5 BTU-in/hr-ftÂ²-Â°F	
	@Temperature 300 Â°C	@Temperature 572 Â°F	
	15.3 W/m-K	106 BTU-in/hr-ftÂ²-Â°F	
	@Temperature 400 Â°C	@Temperature 752 Â°F	
	16.9 W/m-K	117 BTU-in/hr-ftÂ²-Â°F	
	@Temperature 500 Â°C	@Temperature 932 Â°F	
	18.3 W/m-K	127 BTU-in/hr-ftÂ²-Â°F	
	@Temperature 600 Â°C	@Temperature 1110 Â°F	
	19.8 W/m-K	137 BTU-in/hr-ftÂ²-Â°F	
	@Temperature 700 Â°C	@Temperature 1290 Â°F	
	21.5 W/m-K	149 BTU-in/hr-ftÂ²-Â°F	
	@Temperature 800 Â°C	@Temperature 1470 Â°F	
	23.4 W/m-K	162 BTU-in/hr-ftÂ²-Â°F	
	@Temperature 900 Â°C	@Temperature 1650 Â°F	
	25.6 W/m-K	178 BTU-in/hr-ftÂ²-Â°F	
	@Temperature 1000 Â°C	@Temperature 1830 Â°F	
Melting Point	1290 - 1350 Â°C	2350 - 2460 Â°F	
Solidus	1290 Â°C	2350 Â°F	
Liquidus	1350 Â°C	2460 Â°F	

Component Elements Properties	Metric	English	Comments
Aluminum, Al	<= 0.40 %	<= 0.40 %	
Carbon, C	<= 0.10 %	<= 0.10 %	
Chromium, Cr	21 %	21 %	
Cobalt, Co	<= 1.0 %	<= 1.0 %	

Component Elements Properties	Metric	English	Comments
Manganese, Mn	<= 0.50 %	<= 0.50 %	
Molybdenum, Mo	9.0 %	9.0 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.000129 ohm-cm	0.000129 ohm-cm	RT
	0.000132 ohm-cm	0.000132 ohm-cm	
	@Temperature 100 Â°C	@Temperature 212 Â°F	
	0.000134 ohm-cm	0.000134 ohm-cm	
	@Temperature 200 Â°C	@Temperature 392 Â°F	
	0.000135 ohm-cm	0.000135 ohm-cm	
	@Temperature 300 Â°C	@Temperature 572 Â°F	
	0.000135 ohm-cm	0.000135 ohm-cm	
	@Temperature 1000 Â°C	@Temperature 1830 Â°F	
	0.000136 ohm-cm	0.000136 ohm-cm	
	@Temperature 900 Â°C	@Temperature 1650 Â°F	
	0.000136 ohm-cm	0.000136 ohm-cm	
	@Temperature 400 Â°C	@Temperature 752 Â°F	
	0.000137 ohm-cm	0.000137 ohm-cm	
	@Temperature 500 Â°C	@Temperature 932 Â°F	
	0.000137 ohm-cm	0.000137 ohm-cm	
	@Temperature 800 Â°C	@Temperature 1470 Â°F	
	0.000138 ohm-cm	0.000138 ohm-cm	
	@Temperature 600 Â°C	@Temperature 1110 Â°F	
	0.000138 ohm-cm	0.000138 ohm-cm	
	@Temperature 700 Â°C	@Temperature 1290 Â°F	

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