

## Haynes 625 alloy, 10% cold reduction, 1175°C anneal for 5 minutes

Category : Metal , Nonferrous Metal , Nickel Alloy , Superalloy

### Material Notes:

Cb and Ta content 3.7% combined. Excellent strength up to 816°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-10-cold-reduction-1175C-anneal-for-5-minutes.php](http://www.lookpolymers.com/polymer_Haynes-625-alloy-10-cold-reduction-1175C-anneal-for-5-minutes.php)

Physical Properties	Metric	English	Comments
Density	8.44 g/cc	0.305 lb/in <sup>3</sup>	at RT

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	840 MPa	122000 psi	
Tensile Strength, Yield	360 MPa	52200 psi	
	@Strain 0.200 %	@Strain 0.200 %	
Elongation at Break	55 %	55 %	in 50.8 mm
Modulus of Elasticity	208 GPa	30200 ksi	RT
	126 GPa	18300 ksi	
	@Temperature 1000 °C	@Temperature 1830 °F	
	142 GPa	20600 ksi	
	@Temperature 900 °C	@Temperature 1650 °F	
	153 GPa	22200 ksi	
	@Temperature 800 °C	@Temperature 1470 °F	
	163 GPa	23600 ksi	
	@Temperature 700 °C	@Temperature 1290 °F	
	171 GPa	24800 ksi	
	@Temperature 600 °C	@Temperature 1110 °F	
	179 GPa	26000 ksi	
	@Temperature 500 °C	@Temperature 932 °F	
	186 GPa	27000 ksi	
	@Temperature 400 °C	@Temperature 752 °F	

Mechanical Properties	192 GPa Metric	27800 ksi English	Comments
	@Temperature 300 °C	@Temperature 572 °F	
	199 GPa	28900 ksi	
	@Temperature 200 °C	@Temperature 392 °F	
	201 GPa	29200 ksi	
	@Temperature 100 °C	@Temperature 212 °F	

Thermal Properties	Metric	English	Comments
CTE, linear	12.8 µm/m-°C	7.11 µin/in-°F	
	@Temperature 25.0 - 100 °C	@Temperature 77.0 - 212 °F	
	13.1 µm/m-°C	7.28 µin/in-°F	
	@Temperature 25.0 - 200 °C	@Temperature 77.0 - 392 °F	
	13.4 µm/m-°C	7.44 µin/in-°F	
	@Temperature 25.0 - 300 °C	@Temperature 77.0 - 572 °F	
	13.8 µm/m-°C	7.67 µin/in-°F	
	@Temperature 25.0 - 400 °C	@Temperature 77.0 - 752 °F	
	14.2 µm/m-°C	7.89 µin/in-°F	
	@Temperature 25.0 - 500 °C	@Temperature 77.0 - 932 °F	
	14.8 µm/m-°C	8.22 µin/in-°F	
	@Temperature 25.0 - 600 °C	@Temperature 77.0 - 1110 °F	
	15.4 µm/m-°C	8.56 µin/in-°F	
	@Temperature 25.0 - 700 °C	@Temperature 77.0 - 1290 °F	
	16.0 µm/m-°C	8.89 µin/in-°F	
	@Temperature 25.0 - 800 °C	@Temperature 77.0 - 1470 °F	
	16.7 µm/m-°C	9.28 µin/in-°F	
	@Temperature 25.0 - 900 °C	@Temperature 77.0 - 1650 °F	
	17.4 µm/m-°C	9.67 µin/in-°F	

Thermal Properties	@Temperature 25.0 - Metric 1000 °C	@Temperature 77.0 - English 1800 °F	Comments
Specific Heat Capacity	0.410 J/g-°C	0.0980 BTU/lb-°F	RT
	0.428 J/g-°C	0.102 BTU/lb-°F	
	@Temperature 100 °C	@Temperature 212 °F	
	0.455 J/g-°C	0.109 BTU/lb-°F	
	@Temperature 200 °C	@Temperature 392 °F	
	0.477 J/g-°C	0.114 BTU/lb-°F	
	@Temperature 300 °C	@Temperature 572 °F	
	0.503 J/g-°C	0.120 BTU/lb-°F	
	@Temperature 400 °C	@Temperature 752 °F	
	0.527 J/g-°C	0.126 BTU/lb-°F	
	@Temperature 500 °C	@Temperature 932 °F	
	0.552 J/g-°C	0.132 BTU/lb-°F	
	@Temperature 600 °C	@Temperature 1110 °F	
	0.576 J/g-°C	0.138 BTU/lb-°F	
	@Temperature 700 °C	@Temperature 1290 °F	
	0.600 J/g-°C	0.143 BTU/lb-°F	
	@Temperature 800 °C	@Temperature 1470 °F	
	0.625 J/g-°C	0.149 BTU/lb-°F	
	@Temperature 900 °C	@Temperature 1650 °F	
	0.648 J/g-°C	0.155 BTU/lb-°F	
	@Temperature 1000 °C	@Temperature 1830 °F	
Thermal Conductivity	9.80 W/m-K	68.0 BTU-in/hr-ft <sup>2</sup> -°F	RT
	10.9 W/m-K	75.6 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 100 °C	@Temperature 212 °F	
	12.5 W/m-K	86.8 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 200 °C	@Temperature 392 °F	
	13.9 W/m-K	96.5 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 300 °C	@Temperature 572 °F	
	15.3 W/m-K	106 BTU-in/hr-ft <sup>2</sup> -°F	

Thermal Properties	@Temperature 400 °C Metric	@Temperature 752 °F English	Comments
	16.9 W/m-K	117 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 500 °C	@Temperature 932 °F	
	18.3 W/m-K	127 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 600 °C	@Temperature 1110 °F	
	19.8 W/m-K	137 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 700 °C	@Temperature 1290 °F	
	21.5 W/m-K	149 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 800 °C	@Temperature 1470 °F	
	23.4 W/m-K	162 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 900 °C	@Temperature 1650 °F	
	25.6 W/m-K	178 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 1000 °C	@Temperature 1830 °F	
Melting Point	1290 - 1350 °C	2350 - 2460 °F	
Solidus	1290 °C	2350 °F	
Liquidus	1350 °C	2460 °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 %	
Iron, Fe	<= 5.0 %	<= 5.0 %	
Manganese, Mn	<= 0.50 %	<= 0.50 %	
Molybdenum, Mo	9.0 %	9.0 %	
Nickel, Ni	62 %	62 %	As Remainder
Niobium, Nb (Columbium, Cb)	3.7 %	3.7 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.000129 ohm-cm	0.000129 ohm-cm	RT
	0.000132 ohm-cm	0.000132 ohm-cm	

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

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