

## Haynes 625 alloy, 40% cold reduction

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.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_Haynes-625-alloy-40-cold-reduction.php](http://www.lookpolymers.com/polymer_Haynes-625-alloy-40-cold-reduction.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
Hardness, Brinell	389	389	Converted from Rockwell C hardness.
Hardness, Knoop	426	426	Converted from Rockwell C hardness.
Hardness, Rockwell C	42	42	
Hardness, Vickers	410	410	Converted from Rockwell C hardness.
Tensile Strength, Ultimate	1440 MPa	209000 psi	
Tensile Strength, Yield	1230 MPa @Strain 0.200 %	178000 psi @Strain 0.200 %	
Elongation at Break	8.0 %	8.0 %	in 50.8 mm
Modulus of Elasticity	208 GPa	30200 ksi	RT
	126 GPa @Temperature 1000 °C	18300 ksi @Temperature 1830 °F	
	142 GPa @Temperature 900 °C	20600 ksi @Temperature 1650 °F	
	153 GPa @Temperature 800 °C	22200 ksi @Temperature 1470 °F	
	163 GPa @Temperature 700 °C	23600 ksi @Temperature 1290 °F	
	171 GPa @Temperature 600 °C	24800 ksi @Temperature 1110 °F	

Mechanical Properties	179 GPa Metric	25900 ksi English	Comments
	@Temperature 500 °C	@Temperature 932 °F	
	186 GPa	27000 ksi	
	@Temperature 400 °C	@Temperature 752 °F	
	192 GPa	27800 ksi	
	@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	

Thermal Properties	Metric $^{\circ}\text{C}$	English $^{\circ}\text{F}$	Comments
	@Temperature 25.0 - 900 $^{\circ}\text{C}$	@Temperature 77.0 - 1650 $^{\circ}\text{F}$	
	17.4 $\mu\text{m}/\text{m}\text{-}^{\circ}\text{C}$	9.67 $\mu\text{in}/\text{in}\text{-}^{\circ}\text{F}$	
	@Temperature 25.0 - 1000 $^{\circ}\text{C}$	@Temperature 77.0 - 1830 $^{\circ}\text{F}$	
Specific Heat Capacity	0.410 $\text{J}/\text{g}\text{-}^{\circ}\text{C}$	0.0980 $\text{BTU}/\text{lb}\text{-}^{\circ}\text{F}$	RT
	0.428 $\text{J}/\text{g}\text{-}^{\circ}\text{C}$	0.102 $\text{BTU}/\text{lb}\text{-}^{\circ}\text{F}$	
	@Temperature 100 $^{\circ}\text{C}$	@Temperature 212 $^{\circ}\text{F}$	
	0.455 $\text{J}/\text{g}\text{-}^{\circ}\text{C}$	0.109 $\text{BTU}/\text{lb}\text{-}^{\circ}\text{F}$	
	@Temperature 200 $^{\circ}\text{C}$	@Temperature 392 $^{\circ}\text{F}$	
	0.477 $\text{J}/\text{g}\text{-}^{\circ}\text{C}$	0.114 $\text{BTU}/\text{lb}\text{-}^{\circ}\text{F}$	
	@Temperature 300 $^{\circ}\text{C}$	@Temperature 572 $^{\circ}\text{F}$	
	0.503 $\text{J}/\text{g}\text{-}^{\circ}\text{C}$	0.120 $\text{BTU}/\text{lb}\text{-}^{\circ}\text{F}$	
	@Temperature 400 $^{\circ}\text{C}$	@Temperature 752 $^{\circ}\text{F}$	
	0.527 $\text{J}/\text{g}\text{-}^{\circ}\text{C}$	0.126 $\text{BTU}/\text{lb}\text{-}^{\circ}\text{F}$	
	@Temperature 500 $^{\circ}\text{C}$	@Temperature 932 $^{\circ}\text{F}$	
	0.552 $\text{J}/\text{g}\text{-}^{\circ}\text{C}$	0.132 $\text{BTU}/\text{lb}\text{-}^{\circ}\text{F}$	
	@Temperature 600 $^{\circ}\text{C}$	@Temperature 1110 $^{\circ}\text{F}$	
	0.576 $\text{J}/\text{g}\text{-}^{\circ}\text{C}$	0.138 $\text{BTU}/\text{lb}\text{-}^{\circ}\text{F}$	
	@Temperature 700 $^{\circ}\text{C}$	@Temperature 1290 $^{\circ}\text{F}$	
	0.600 $\text{J}/\text{g}\text{-}^{\circ}\text{C}$	0.143 $\text{BTU}/\text{lb}\text{-}^{\circ}\text{F}$	
	@Temperature 800 $^{\circ}\text{C}$	@Temperature 1470 $^{\circ}\text{F}$	
	0.625 $\text{J}/\text{g}\text{-}^{\circ}\text{C}$	0.149 $\text{BTU}/\text{lb}\text{-}^{\circ}\text{F}$	
	@Temperature 900 $^{\circ}\text{C}$	@Temperature 1650 $^{\circ}\text{F}$	
	0.648 $\text{J}/\text{g}\text{-}^{\circ}\text{C}$	0.155 $\text{BTU}/\text{lb}\text{-}^{\circ}\text{F}$	
	@Temperature 1000 $^{\circ}\text{C}$	@Temperature 1830 $^{\circ}\text{F}$	
Thermal Conductivity	9.80 $\text{W}/\text{m}\text{-}\text{K}$	68.0 $\text{BTU}\text{-in}/\text{hr}\text{-ft}^2\text{-}^{\circ}\text{F}$	RT
	10.9 $\text{W}/\text{m}\text{-}\text{K}$	75.6 $\text{BTU}\text{-in}/\text{hr}\text{-ft}^2\text{-}^{\circ}\text{F}$	
	@Temperature 100 $^{\circ}\text{C}$	@Temperature 212 $^{\circ}\text{F}$	
	12.5 $\text{W}/\text{m}\text{-}\text{K}$	86.8 $\text{BTU}\text{-in}/\text{hr}\text{-ft}^2\text{-}^{\circ}\text{F}$	
	@Temperature 200 $^{\circ}\text{C}$	@Temperature 392 $^{\circ}\text{F}$	

Thermal Properties	Metric	English	Comments
	@Temperature 300 °C	@Temperature 572 °F	
	15.3 W/m-K	106 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 400 °C	@Temperature 752 °F	
	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 %	

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 °C	@Temperature 212 °F	

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

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