

## Haynes 25 alloy, room temperature after 25% cold reduction, 1120°C anneal for 5 minutes

Category : Metal , Nonferrous Metal , Cobalt Alloy , Superalloy

### Material Notes:

Excellent high-temperature strength with good resistance to oxidizing environments up to 980°C for prolonged exposures and excellent resistance to sulfidation and excellent resistance to metal galling. Applications in the aerospace industry, including parts in military and commercial gas turbine engines. Data provided by the manufacturer, Haynes International, Inc.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_Haynes-25-alloy-room-temperature-after-25-cold-reduction-1120C-anneal-for-5-minutes.php](http://www.lookpolymers.com/polymer_Haynes-25-alloy-room-temperature-after-25-cold-reduction-1120C-anneal-for-5-minutes.php)

Physical Properties	Metric	English	Comments
Density	9.13 g/cc	0.330 lb/in <sup>3</sup>	at RT

Mechanical Properties	Metric	English	Comments
Hardness, Brinell	290	290	Converted from Rockwell C hardness.
Hardness, Knoop	311	311	Converted from Rockwell C hardness.
Hardness, Rockwell C	30	30	
Hardness, Vickers	301	301	Converted from Rockwell C hardness.
Tensile Strength, Ultimate	1140 MPa	165000 psi	
Tensile Strength, Yield	570 MPa @Strain 0.200 %	82700 psi @Strain 0.200 %	
Elongation at Break	48 %	48 %	in 51 mm
Modulus of Elasticity	225 GPa	32600 ksi	RT
	146 GPa @Temperature 1000 °C	21200 ksi @Temperature 1830 °F	
	154 GPa @Temperature 900 °C	22300 ksi @Temperature 1650 °F	
	163 GPa @Temperature 800 °C	23600 ksi @Temperature 1470 °F	
	174 GPa	25200 ksi @Temperature 1290	

Mechanical Properties	@Temperature 700 Å°C Metric	Å°F English	Comments
	181 GPa	26300 ksi	
	@Temperature 600 Å°C	@Temperature 1110 Å°F	
	188 GPa	27300 ksi	
	@Temperature 500 Å°C	@Temperature 932 Å°F	
	197 GPa	28600 ksi	
	@Temperature 400 Å°C	@Temperature 752 Å°F	
	204 GPa	29600 ksi	
	@Temperature 300 Å°C	@Temperature 572 Å°F	
	214 GPa	31000 ksi	
	@Temperature 200 Å°C	@Temperature 392 Å°F	
	222 GPa	32200 ksi	
	@Temperature 100 Å°C	@Temperature 212 Å°F	
<b>Charpy Impact</b>	262 J	193 ft-lb	
	144 J	106 ft-lb	
	@Temperature 980 Å°C	@Temperature 1800 Å°F	
	148 J	109 ft-lb	
	@Temperature -196 Å°C	@Temperature -321 Å°F	
	163 J	120 ft-lb	
	@Temperature 870 Å°C	@Temperature 1600 Å°F	
	182 J	134 ft-lb	
	@Temperature -138 Å°C	@Temperature -216 Å°F	
	194 J	143 ft-lb	
	@Temperature 760 Å°C	@Temperature 1400 Å°F	
	212 J	156 ft-lb	
	@Temperature -78.0 Å°C	@Temperature -108 Å°F	
	230 J	170 ft-lb	
	@Temperature 650 Å°C	@Temperature 1200	

Mechanical Properties	Metric	English	Comments
	243 J	173 ft-lb	
	@Temperature -29.0 Â°C	@Temperature -20.2 Â°F	
	273 J	201 ft-lb	
	@Temperature 540 Â°C	@Temperature 1000 Â°F	
	297 J	219 ft-lb	
	@Temperature 260 Â°C	@Temperature 500 Â°F	

Thermal Properties	Metric	English	Comments
CTE, linear	12.3 Âµm/m-Â°C	6.83 Âµin/in-Â°F	
	@Temperature 25.0 - 100 Â°C	@Temperature 77.0 - 212 Â°F	
	12.9 Âµm/m-Â°C	7.17 Âµin/in-Â°F	
	@Temperature 25.0 - 200 Â°C	@Temperature 77.0 - 392 Â°F	
	13.6 Âµm/m-Â°C	7.56 Âµin/in-Â°F	
	@Temperature 25.0 - 300 Â°C	@Temperature 77.0 - 572 Â°F	
	14.3 Âµm/m-Â°C	7.94 Âµin/in-Â°F	
	@Temperature 25.0 - 500 Â°C	@Temperature 77.0 - 932 Â°F	
	14.3 Âµm/m-Â°C	7.94 Âµin/in-Â°F	
	@Temperature 25.0 - 400 Â°C	@Temperature 77.0 - 752 Â°F	
	14.6 Âµm/m-Â°C	8.11 Âµin/in-Â°F	
	@Temperature 25.0 - 600 Â°C	@Temperature 77.0 - 1110 Â°F	
	15.1 Âµm/m-Â°C	8.39 Âµin/in-Â°F	
	@Temperature 25.0 - 700 Â°C	@Temperature 77.0 - 1290 Â°F	
15.8 Âµm/m-Â°C	8.78 Âµin/in-Â°F		
@Temperature 25.0 - 800 Â°C	@Temperature 77.0 - 1470 Â°F		
16.5 Âµm/m-Â°C	9.17 Âµin/in-Â°F		
@Temperature 25.0 - 900 Â°C	@Temperature 77.0 - 1650 Â°F		

Thermal Properties	Metric $\text{W/m}\cdot\text{K}$	English $\text{BTU}\cdot\text{in/hr}\cdot\text{ft}^2\cdot\text{in}\cdot\text{F}$	Comments
	@Temperature 25.0 - 1000 $\text{Å}^\circ\text{C}$	@Temperature 77.0 - 1830 $\text{Å}^\circ\text{F}$	
Thermal Conductivity	9.40 W/m-K	65.2 BTU-in/hr-ft $\text{Å}^2$ - $\text{Å}^\circ\text{F}$	RT
	10.9 W/m-K @Temperature 100 $\text{Å}^\circ\text{C}$	75.6 BTU-in/hr-ft $\text{Å}^2$ - $\text{Å}^\circ\text{F}$ @Temperature 212 $\text{Å}^\circ\text{F}$	
	12.9 W/m-K @Temperature 200 $\text{Å}^\circ\text{C}$	89.5 BTU-in/hr-ft $\text{Å}^2$ - $\text{Å}^\circ\text{F}$ @Temperature 392 $\text{Å}^\circ\text{F}$	
	14.8 W/m-K @Temperature 300 $\text{Å}^\circ\text{C}$	103 BTU-in/hr-ft $\text{Å}^2$ - $\text{Å}^\circ\text{F}$ @Temperature 572 $\text{Å}^\circ\text{F}$	
	16.8 W/m-K @Temperature 400 $\text{Å}^\circ\text{C}$	117 BTU-in/hr-ft $\text{Å}^2$ - $\text{Å}^\circ\text{F}$ @Temperature 752 $\text{Å}^\circ\text{F}$	
	18.7 W/m-K @Temperature 500 $\text{Å}^\circ\text{C}$	130 BTU-in/hr-ft $\text{Å}^2$ - $\text{Å}^\circ\text{F}$ @Temperature 932 $\text{Å}^\circ\text{F}$	
	20.7 W/m-K @Temperature 600 $\text{Å}^\circ\text{C}$	144 BTU-in/hr-ft $\text{Å}^2$ - $\text{Å}^\circ\text{F}$ @Temperature 1110 $\text{Å}^\circ\text{F}$	
	22.6 W/m-K @Temperature 700 $\text{Å}^\circ\text{C}$	157 BTU-in/hr-ft $\text{Å}^2$ - $\text{Å}^\circ\text{F}$ @Temperature 1290 $\text{Å}^\circ\text{F}$	
	24.7 W/m-K @Temperature 800 $\text{Å}^\circ\text{C}$	171 BTU-in/hr-ft $\text{Å}^2$ - $\text{Å}^\circ\text{F}$ @Temperature 1470 $\text{Å}^\circ\text{F}$	
	26.7 W/m-K @Temperature 900 $\text{Å}^\circ\text{C}$	185 BTU-in/hr-ft $\text{Å}^2$ - $\text{Å}^\circ\text{F}$ @Temperature 1650 $\text{Å}^\circ\text{F}$	
	29.2 W/m-K @Temperature 1000 $\text{Å}^\circ\text{C}$	203 BTU-in/hr-ft $\text{Å}^2$ - $\text{Å}^\circ\text{F}$ @Temperature 1830 $\text{Å}^\circ\text{F}$	
Melting Point	1330 - 1410 $\text{Å}^\circ\text{C}$	2430 - 2570 $\text{Å}^\circ\text{F}$	
Solidus	1330 $\text{Å}^\circ\text{C}$	2430 $\text{Å}^\circ\text{F}$	
Liquidus	1410 $\text{Å}^\circ\text{C}$	2570 $\text{Å}^\circ\text{F}$	

Component Elements Properties	Metric	English	Comments
Carbon, C	0.10 %	0.10 %	
Chromium, Cr	20 %	20 %	
Cobalt, Co	51 %	51 %	
Iron, Fe	<= 3.0 %	<= 3.0 %	
Manganese, Mn	1.5 %	1.5 %	
Nickel, Ni	10 %	10 %	
Silicon, Si	<= 0.40 %	<= 0.40 %	
Tungsten, W	15 %	15 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000886 ohm-cm	0.0000886 ohm-cm	RT
	0.0000950 ohm-cm	0.0000950 ohm-cm	
	@Temperature 1000 Â°C	@Temperature 1830 Â°F	
	0.0001011 ohm-cm	0.0001011 ohm-cm	
	@Temperature 900 Â°C	@Temperature 1650 Â°F	
	0.0001066 ohm-cm	0.0001066 ohm-cm	
	@Temperature 700 Â°C	@Temperature 1290 Â°F	
	0.0001078 ohm-cm	0.0001078 ohm-cm	
	@Temperature 800 Â°C	@Temperature 1470 Â°F	

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