

## Haynes 25 alloy, room temperature after 15% cold reduction

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-15-cold-reduction.php](http://www.lookpolymers.com/polymer_Haynes-25-alloy-room-temperature-after-15-cold-reduction.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	369	369	Converted from Rockwell C hardness.
Hardness, Knoop	403	403	Converted from Rockwell C hardness.
Hardness, Rockwell C	40	40	
Hardness, Vickers	388	388	Converted from Rockwell C hardness.
Tensile Strength, Ultimate	1230 MPa	178000 psi	
Tensile Strength, Yield	1025 MPa @Strain 0.200 %	148700 psi @Strain 0.200 %	
Elongation at Break	27.7 %	27.7 %	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 @Temperature 700 °C	25200 ksi @Temperature 1290 °F	
	181 GPa @Temperature 600 °C	26300 ksi @Temperature 1110 °F	

Mechanical Properties	188 GPa Metric	27300 ksi English	Comments
	@Temperature 500 °C	@Temperature 932 °F	
	<b>197 GPa</b>	<b>28600 ksi</b>	
	@Temperature 400 °C	@Temperature 752 °F	
	<b>204 GPa</b>	<b>29600 ksi</b>	
	@Temperature 300 °C	@Temperature 572 °F	
	<b>214 GPa</b>	<b>31000 ksi</b>	
	@Temperature 200 °C	@Temperature 392 °F	
	<b>222 GPa</b>	<b>32200 ksi</b>	
	@Temperature 100 °C	@Temperature 212 °F	
<b>Charpy Impact</b>	<b>262 J</b>	<b>193 ft-lb</b>	
	<b>144 J</b>	<b>106 ft-lb</b>	
	@Temperature 980 °C	@Temperature 1800 °F	
	<b>148 J</b>	<b>109 ft-lb</b>	
	@Temperature -196 °C	@Temperature -321 °F	
	<b>163 J</b>	<b>120 ft-lb</b>	
	@Temperature 870 °C	@Temperature 1600 °F	
	<b>182 J</b>	<b>134 ft-lb</b>	
	@Temperature -138 °C	@Temperature -216 °F	
	<b>194 J</b>	<b>143 ft-lb</b>	
	@Temperature 760 °C	@Temperature 1400 °F	
	<b>212 J</b>	<b>156 ft-lb</b>	
	@Temperature -78.0 °C	@Temperature -108 °F	
	<b>230 J</b>	<b>170 ft-lb</b>	
	@Temperature 650 °C	@Temperature 1200 °F	
	<b>243 J</b>	<b>179 ft-lb</b>	
	@Temperature -29.0 °C	@Temperature -20.2 °F	
	<b>273 J</b>	<b>201 ft-lb</b>	
	@Temperature 540 °C	@Temperature 1000 °F	
	<b>297 J</b>	<b>219 ft-lb</b>	
	@Temperature 260 °C	@Temperature 500 °F	

Thermal Properties	Metric	English	Comments
CTE, linear	12.3 $\mu\text{m}/\text{m}\cdot\text{°C}$	6.83 $\mu\text{in}/\text{in}\cdot\text{°F}$	
	@Temperature 25.0 - 100 $\text{°C}$	@Temperature 77.0 - 212 $\text{°F}$	
	12.9 $\mu\text{m}/\text{m}\cdot\text{°C}$	7.17 $\mu\text{in}/\text{in}\cdot\text{°F}$	
	@Temperature 25.0 - 200 $\text{°C}$	@Temperature 77.0 - 392 $\text{°F}$	
	13.6 $\mu\text{m}/\text{m}\cdot\text{°C}$	7.56 $\mu\text{in}/\text{in}\cdot\text{°F}$	
	@Temperature 25.0 - 300 $\text{°C}$	@Temperature 77.0 - 572 $\text{°F}$	
	14.3 $\mu\text{m}/\text{m}\cdot\text{°C}$	7.94 $\mu\text{in}/\text{in}\cdot\text{°F}$	
	@Temperature 25.0 - 500 $\text{°C}$	@Temperature 77.0 - 932 $\text{°F}$	
	14.3 $\mu\text{m}/\text{m}\cdot\text{°C}$	7.94 $\mu\text{in}/\text{in}\cdot\text{°F}$	
	@Temperature 25.0 - 400 $\text{°C}$	@Temperature 77.0 - 752 $\text{°F}$	
14.6 $\mu\text{m}/\text{m}\cdot\text{°C}$	8.11 $\mu\text{in}/\text{in}\cdot\text{°F}$		
@Temperature 25.0 - 600 $\text{°C}$	@Temperature 77.0 - 1110 $\text{°F}$		
15.1 $\mu\text{m}/\text{m}\cdot\text{°C}$	8.39 $\mu\text{in}/\text{in}\cdot\text{°F}$		
@Temperature 25.0 - 700 $\text{°C}$	@Temperature 77.0 - 1290 $\text{°F}$		
15.8 $\mu\text{m}/\text{m}\cdot\text{°C}$	8.78 $\mu\text{in}/\text{in}\cdot\text{°F}$		
@Temperature 25.0 - 800 $\text{°C}$	@Temperature 77.0 - 1470 $\text{°F}$		
16.5 $\mu\text{m}/\text{m}\cdot\text{°C}$	9.17 $\mu\text{in}/\text{in}\cdot\text{°F}$		
@Temperature 25.0 - 900 $\text{°C}$	@Temperature 77.0 - 1650 $\text{°F}$		
17.0 $\mu\text{m}/\text{m}\cdot\text{°C}$	9.44 $\mu\text{in}/\text{in}\cdot\text{°F}$		
@Temperature 25.0 - 1000 $\text{°C}$	@Temperature 77.0 - 1830 $\text{°F}$		
Thermal Conductivity	9.40 W/m-K	65.2 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 $\text{°C}$	@Temperature 212 $\text{°F}$	
	12.9 W/m-K	89.5 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 200 $\text{°C}$	@Temperature 392 $\text{°F}$	

Thermal Properties	14.8 W/m-K Metric	103 BTU-in/hr-ft <sup>2</sup> -°F English	Comments
	@Temperature 300 °C	@Temperature 572 °F	
	16.8 W/m-K	117 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 400 °C	@Temperature 752 °F	
	18.7 W/m-K	130 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 500 °C	@Temperature 932 °F	
	20.7 W/m-K	144 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 600 °C	@Temperature 1110 °F	
	22.6 W/m-K	157 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 700 °C	@Temperature 1290 °F	
	24.7 W/m-K	171 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 800 °C	@Temperature 1470 °F	
	26.7 W/m-K	185 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 900 °C	@Temperature 1650 °F	
	29.2 W/m-K	203 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 1000 °C	@Temperature 1830 °F	
Melting Point	1330 - 1410 °C	2430 - 2570 °F	
Solidus	1330 °C	2430 °F	
Liquidus	1410 °C	2570 °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 °C	@Temperature 1830 °F	
	0.0001011 ohm-cm	0.0001011 ohm-cm	
	@Temperature 900 °C	@Temperature 1650 °F	
	0.0001066 ohm-cm	0.0001066 ohm-cm	
	@Temperature 700 °C	@Temperature 1290 °F	
	0.0001078 ohm-cm	0.0001078 ohm-cm	
	@Temperature 800 °C	@Temperature 1470 °F	

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