

## Haynes 25 alloy, room temperature after 10% cold reduction, 1065°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-10-cold-reduction-1065C-anneal-for-5-minutes.php](http://www.lookpolymers.com/polymer_Haynes-25-alloy-room-temperature-after-10-cold-reduction-1065C-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	304	304	Converted from Rockwell C hardness.
Hardness, Knoop	326	326	Converted from Rockwell C hardness.
Hardness, Rockwell C	32	32	
Hardness, Vickers	316	316	Converted from Rockwell C hardness.
Tensile Strength, Ultimate	1125 MPa	163200 psi	
Tensile Strength, Yield	675 MPa	97900 psi	
	@Strain 0.200 %	@Strain 0.200 %	
Elongation at Break	39.3 %	39.3 %	in 51 mm
Modulus of Elasticity	225 GPa	32600 ksi	RT
	146 GPa	21200 ksi	
	@Temperature 1000 °C	@Temperature 1830 °F	
	154 GPa	22300 ksi	
	@Temperature 900 °C	@Temperature 1650 °F	
	163 GPa	23600 ksi	
	@Temperature 800 °C	@Temperature 1470 °F	
	174 GPa	25200 ksi	
	@Temperature 700 °C	@Temperature 1290 °F	
	181 GPa	26300 ksi	

<b>Mechanical Properties</b>	<b>@Temperature 600 °C Metric</b>	<b>@Temperature 1110 °F English</b>	<b>Comments</b>
	<b>188 GPa</b>	<b>27300 ksi</b>	
	@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>	

Mechanical Properties	Metric @ Temperature 260 °C	English @ Temperature 500 °F	Comments
<b>Thermal Properties</b>			
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 °C	@ Temperature 77.0 - 212 °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 °C	@ Temperature 77.0 - 392 °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 °C	@ Temperature 77.0 - 572 °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 °C	@ Temperature 77.0 - 932 °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 °C	@ Temperature 77.0 - 752 °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 °C	@ Temperature 77.0 - 1110 °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 °C	@ Temperature 77.0 - 1290 °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 °C	@ Temperature 77.0 - 1470 °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 °C	@ Temperature 77.0 - 1650 °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 °C	@ Temperature 77.0 - 1830 °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 °C	@ Temperature 212 °F	

Thermal Properties	12.9 W/m-K Metric	89.5 BTU-in/hr-ft <sup>2</sup> -°F English	Comments
	@Temperature 200 °C	@Temperature 392 °F	
	14.8 W/m-K	103 BTU-in/hr-ft <sup>2</sup> -°F	
	@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 %	

Component Elements Properties	Metric	English	Comments
Electrical Properties			
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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