

## Haynes 556® alloy, bar after 16000 hours at 648°C

Category : Metal , Superalloy , Iron Base

### Material Notes:

Effective resistance to sulfidizing, carburizing, and chlorine-bearing environments at high temperature; good oxidation resistance, fabricability, and excellent high-temperature strength; resists corrosion by molten chloride salts and is resistant to corrosion from molten zinc. Excellent forming and welding characteristics. Applications include tubing and structural members in municipal and industrial waste incinerators, rotary calciners and kilns for minerals processing, and non-rotating components in land-based gas turbines burning low-grade fuels; carbon regenerators, and in processes involving high-sulfur petroleum feedstocks; widely used for hot-dip galvanizing fixtures, spinners, and baskets, high speed furnace fans, air preheaters of diesel engines, the inner covers of coil annealing furnaces, and various high temperature applications in the aerospace industry. Data provided by the manufacturer, Haynes International, Inc.

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[http://www.lookpolymers.com/polymer\\_Haynes-556-alloy-bar-after-16000-hours-at-648C.php](http://www.lookpolymers.com/polymer_Haynes-556-alloy-bar-after-16000-hours-at-648C.php)

Physical Properties	Metric	English	Comments
Density	8.23 g/cc	0.297 lb/in <sup>3</sup>	at RT

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	610 MPa	88500 psi	
Tensile Strength, Yield	260 MPa	37700 psi	
	@Strain 0.200 %	@Strain 0.200 %	
Elongation at Break	23.4 %	23.4 %	in 50.8 mm
Modulus of Elasticity	205 GPa	29700 ksi	RT
	138 GPa	20000 ksi	
	@Temperature 1000 °C	@Temperature 1830 °F	
	143 GPa	20700 ksi	
	@Temperature 900 °C	@Temperature 1650 °F	
	148 GPa	21500 ksi	
	@Temperature 800 °C	@Temperature 1470 °F	
	155 GPa	22500 ksi	
	@Temperature 700 °C	@Temperature 1290 °F	
	164 GPa	23800 ksi	
		@Temperature 1110	

Mechanical Properties	@Temperature 600 Â°C Metric	Â°F English	Comments
	172 GPa	24900 ksi	
	@Temperature 500 Â°C	@Temperature 932 Â°F	
	179 GPa	26000 ksi	
	@Temperature 400 Â°C	@Temperature 752 Â°F	
	187 GPa	27100 ksi	
	@Temperature 300 Â°C	@Temperature 572 Â°F	
	195 GPa	28300 ksi	
	@Temperature 200 Â°C	@Temperature 392 Â°F	
	200 GPa	29000 ksi	
	@Temperature 100 Â°C	@Temperature 212 Â°F	
Charpy Impact	240 J	177 ft-lb	Samples did not break. Average of 4 or more tests.

Thermal Properties	Metric	English	Comments
CTE, linear	14.7 Âµm/m-Â°C	8.17 Âµin/in-Â°F	
	@Temperature 25.0 - 100 Â°C	@Temperature 77.0 - 212 Â°F	
	14.9 Âµm/m-Â°C	8.28 Âµin/in-Â°F	
	@Temperature 25.0 - 200 Â°C	@Temperature 77.0 - 392 Â°F	
	15.1 Âµm/m-Â°C	8.39 Âµin/in-Â°F	
	@Temperature 25.0 - 300 Â°C	@Temperature 77.0 - 572 Â°F	
	15.4 Âµm/m-Â°C	8.56 Âµin/in-Â°F	
	@Temperature 25.0 - 400 Â°C	@Temperature 77.0 - 752 Â°F	
	15.7 Âµm/m-Â°C	8.72 Âµin/in-Â°F	
	@Temperature 25.0 - 500 Â°C	@Temperature 77.0 - 932 Â°F	
	16.1 Âµm/m-Â°C	8.94 Âµin/in-Â°F	
	@Temperature 25.0 - 600 Â°C	@Temperature 77.0 - 1110 Â°F	
	16.4 Âµm/m-Â°C	9.11 Âµin/in-Â°F	
	@Temperature 25.0 - 700 Â°C	@Temperature 77.0 - 1290 Â°F	

Thermal Properties	Metric	English	Comments
	@Temperature 25.0 - 800 Å°C	@Temperature 77.0 - 1470 Å°F	
	17.0 Åµm/m-Å°C	9.44 Åµin/in-Å°F	
	@Temperature 25.0 - 900 Å°C	@Temperature 77.0 - 1650 Å°F	
	17.1 Åµm/m-Å°C	9.50 Åµin/in-Å°F	
	@Temperature 25.0 - 1000 Å°C	@Temperature 77.0 - 1830 Å°F	
Specific Heat Capacity	0.464 J/g-Å°C	0.111 BTU/lb-Å°F	RT
	0.475 J/g-Å°C	0.114 BTU/lb-Å°F	
	@Temperature 100 Å°C	@Temperature 212 Å°F	
	0.493 J/g-Å°C	0.118 BTU/lb-Å°F	
	@Temperature 200 Å°C	@Temperature 392 Å°F	
	0.508 J/g-Å°C	0.121 BTU/lb-Å°F	
	@Temperature 300 Å°C	@Temperature 572 Å°F	
	0.523 J/g-Å°C	0.125 BTU/lb-Å°F	
	@Temperature 400 Å°C	@Temperature 752 Å°F	
	0.538 J/g-Å°C	0.129 BTU/lb-Å°F	
	@Temperature 500 Å°C	@Temperature 932 Å°F	
	0.552 J/g-Å°C	0.132 BTU/lb-Å°F	
	@Temperature 600 Å°C	@Temperature 1110 Å°F	
	0.561 J/g-Å°C	0.134 BTU/lb-Å°F	
	@Temperature 700 Å°C	@Temperature 1290 Å°F	
	0.570 J/g-Å°C	0.136 BTU/lb-Å°F	
	@Temperature 800 Å°C	@Temperature 1470 Å°F	
	0.595 J/g-Å°C	0.142 BTU/lb-Å°F	
	@Temperature 900 Å°C	@Temperature 1650 Å°F	
	0.618 J/g-Å°C	0.148 BTU/lb-Å°F	
	@Temperature 1000 Å°C	@Temperature 1830 Å°F	

Thermal Properties	0.638 J/g-Â°C Metric	0.152 BTU/lb-Â°F English	Comments
	@Temperature 1100 Â°C	@Temperature 2010 Â°F	
Thermal Conductivity	11.1 W/m-K	77.0 BTU-in/hr-ftÂ²- Â°F	RT
	13.1 W/m-K  @Temperature 100 Â°C	90.9 BTU-in/hr-ftÂ²- Â°F  @Temperature 212 Â°F	
	15.4 W/m-K  @Temperature 200 Â°C	107 BTU-in/hr-ftÂ²-Â°F  @Temperature 392 Â°F	
	17.3 W/m-K  @Temperature 300 Â°C	120 BTU-in/hr-ftÂ²-Â°F  @Temperature 572 Â°F	
	19.0 W/m-K  @Temperature 400 Â°C	132 BTU-in/hr-ftÂ²-Â°F  @Temperature 752 Â°F	
	20.8 W/m-K  @Temperature 500 Â°C	144 BTU-in/hr-ftÂ²-Â°F  @Temperature 932 Â°F	
	22.4 W/m-K  @Temperature 600 Â°C	155 BTU-in/hr-ftÂ²-Â°F  @Temperature 1110 Â°F	
	24.0 W/m-K  @Temperature 700 Â°C	167 BTU-in/hr-ftÂ²-Â°F  @Temperature 1290 Â°F	
	25.5 W/m-K  @Temperature 800 Â°C	177 BTU-in/hr-ftÂ²-Â°F  @Temperature 1470 Â°F	
	27.2 W/m-K  @Temperature 900 Â°C	189 BTU-in/hr-ftÂ²-Â°F  @Temperature 1650 Â°F	
	28.9 W/m-K  @Temperature 1000 Â°C	201 BTU-in/hr-ftÂ²-Â°F  @Temperature 1830 Â°F	
	30.4 W/m-K  @Temperature 1100 Â°C	211 BTU-in/hr-ftÂ²-Â°F  @Temperature 2010 Â°F	
Melting Point	1330 - 1415 Â°C	2430 - 2579 Â°F	
Solidus	1330 Â°C	2430 Â°F	

Thermal Properties	Metric	English	Comments
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Component Elements Properties	Metric	English	Comments
Aluminum, Al	0.20 %	0.20 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000952 ohm-cm	0.0000952 ohm-cm	RT
	0.0000986 ohm-cm	0.0000986 ohm-cm	
	@Temperature 100 Â°C	@Temperature 212 Â°F	
	0.0001026 ohm-cm	0.0001026 ohm-cm	
	@Temperature 200 Â°C	@Temperature 392 Â°F	
	0.0001065 ohm-cm	0.0001065 ohm-cm	
	@Temperature 300 Â°C	@Temperature 572 Â°F	
	0.0001095 ohm-cm	0.0001095 ohm-cm	
	@Temperature 400 Â°C	@Temperature 752 Â°F	
	0.0001125 ohm-cm	0.0001125 ohm-cm	
	@Temperature 500 Â°C	@Temperature 932 Â°F	
	0.0001151 ohm-cm	0.0001151 ohm-cm	
	@Temperature 600 Â°C	@Temperature 1110 Â°F	
	0.0001172 ohm-cm	0.0001172 ohm-cm	
	@Temperature 700 Â°C	@Temperature 1290 Â°F	
	0.000119 ohm-cm	0.000119 ohm-cm	
	@Temperature 800 Â°C	@Temperature 1470 Â°F	
	0.0001207 ohm-cm	0.0001207 ohm-cm	
	@Temperature 900 Â°C	@Temperature 1650 Â°F	
	0.0001223 ohm-cm	0.0001223 ohm-cm	
	@Temperature 1000 Â°C	@Temperature 1830 Â°F	
	0.0001237 ohm-cm	0.0001237 ohm-cm	
	@Temperature 1100 Â°C	@Temperature 2010 Â°F	

Electrical Properties

Metric

English

Comments

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