



ASM Aerospace Specification Metals Inc.



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Haynes® Waspaloy™ alloy, sheet, tested at 980°C (1800°F)

**Subcategory:** Metal; Nickel Base; Superalloy

**Key Words:** AMS 5544

Component	Wt. %	Component	Wt. %	Component	Wt. %
Al	1.5	Cr	19	Ni	56
B	0.006	Fe	Max 2	Si	Max 0.15
C	0.08	Mn	Max 0.1	Ti	3
Co	13.5	Mo	4.3	Zr	0.05

#### Material Notes:

Nickel content to balance. Age-hardenable superalloy with very good strength at temperatures up 980°C (1800°F), can be cold-formed in the annealed condition, may also be hot formed at 1040°C (1900°F) and above, good resistance to gas turbine combustion gas environments at temperatures up to 870°C (1600°F). Widely used as a wrought material for forged and fabricated gas turbine and aerospace components.

Data provided by the manufacturer, Haynes International, Inc.

Physical Properties	Metric	English	Comments
Density	<u>8.2 g/cc</u>	0.296 lb/in <sup>3</sup>	at RT

#### Mechanical Properties

Tensile Strength, Ultimate	<u>220 MPa</u>	31900 psi	
Tensile Strength, Yield	<u>135 MPa</u>	19600 psi	at 0.2% offset
Elongation at Break	<u>19.4 %</u>	19.4 %	in 51 mm
Modulus of Elasticity	<u>213 GPa</u>	30900 ksi	20°C
Modulus of Elasticity at Elevated Temperature	<u>146 GPa</u>	21200 ksi	1000°C (1830°F)
Modulus of Elasticity at Elevated Temperature	<u>155 GPa</u>	22500 ksi	900°C (1650°F)
Modulus of Elasticity at Elevated Temperature	<u>164 GPa</u>	23800 ksi	800°C (1470°F)

Modulus of Elasticity at Elevated Temperature	<a href="#">172 GPa</a>	24900 ksi	700°C (1290°F)
Modulus of Elasticity at Elevated Temperature	<a href="#">180 GPa</a>	26100 ksi	600°C (1110°F)
Modulus of Elasticity at Elevated Temperature	<a href="#">192 GPa</a>	27800 ksi	400°C (750°F)
Modulus of Elasticity at Elevated Temperature	<a href="#">204 GPa</a>	29600 ksi	200°C (390°F)

## Thermal Properties

CTE, linear 500°C	<a href="#">13.9 µm/m-°C</a>	7.72 µin/in-°F	20-500°C (68-930°F)
CTE, linear 1000°C	<a href="#">14.3 µm/m-°C</a>	7.94 µin/in-°F	20-600°C (68-1110°F)
CTE, linear 1000°C	<a href="#">14.8 µm/m-°C</a>	8.22 µin/in-°F	20-700°C (68-1290°F)
CTE, linear 1000°C	<a href="#">15.4 µm/m-°C</a>	8.56 µin/in-°F	20-800°C (68-1470°F)
CTE, linear 1000°C	<a href="#">16.4 µm/m-°C</a>	9.11 µin/in-°F	20-900°C (68-1650°F)
CTE, linear 1000°C	<a href="#">17.8 µm/m-°C</a>	9.89 µin/in-°F	20-1000°C (68-1830°F)
Thermal Conductivity at Elevated Temperature	<a href="#">12.6 W/m-K</a>	87.4 BTU-in/hr-ft <sup>2</sup> -°F	200°C (390°F)
Thermal Conductivity at Elevated Temperature	<a href="#">15.7 W/m-K</a>	109 BTU-in/hr-ft <sup>2</sup> -°F	400°C (750°F)
Thermal Conductivity at Elevated Temperature	<a href="#">19.1 W/m-K</a>	133 BTU-in/hr-ft <sup>2</sup> -°F	600°C (1110°F)
Thermal Conductivity at Elevated Temperature	<a href="#">20.9 W/m-K</a>	145 BTU-in/hr-ft <sup>2</sup> -°F	700°C (1290°F)
Thermal Conductivity at Elevated Temperature	<a href="#">22.7 W/m-K</a>	158 BTU-in/hr-ft <sup>2</sup> -°F	800°C (1470°F)
Thermal Conductivity at Elevated Temperature	<a href="#">24.5 W/m-K</a>	170 BTU-in/hr-ft <sup>2</sup> -°F	900°C (1650°F)
Melting Point	1330 - 1360 °C	2430 - 2480 °F	

Some of the values displayed above may have been converted from their original units and/or rounded in order to display the information in a consistent format. Users requiring more precise data for scientific or engineering calculations can click on the property value to see the original value as well as raw conversions to equivalent units. We advise that you only use the original value or one of its raw conversions in your calculations to minimize rounding error.