



ASM Aerospace Specification Metals Inc.

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Haynes® 25 alloy, vacuum investment castings, solution treated, tested at 760°C (1400°F)

Subcategory: Cobalt Base; Metal; Superalloy

Key Words: UNS R30605, AMS 5537, AMS 5759, AMS 5796, AMS 5795

Component	Wt. %
C	0.1
Co	51
Cr	20
Fe	Max 3
Mn	1.5
Ni	10
Si	Max 0.4
W	15

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.

Physical Properties	Metric	English	Comments
Density	<u>9.13 g/cc</u>	0.33 lb/in ³	at RT
Mechanical Properties			
Tensile Strength, Ultimate	<u>315 MPa</u>	45700 psi	
Tensile Strength, Yield	<u>170 MPa</u>	24700 psi	at 0.2%
Elongation at Break	<u>24 %</u>	24 %	in 5D
Reduction of Area	<u>29 %</u>	29 %	
Modulus of Elasticity	<u>225 GPa</u>	32600 ksi	RT
Modulus of Elasticity at Elevated Temperature	<u>146 GPa</u>	21200 ksi	1000°C (1830°F)

Modulus of Elasticity at Elevated Temperature	<u>154 GPa</u>	22300 ksi	900°C (1650°F)
Modulus of Elasticity at Elevated Temperature	<u>163 GPa</u>	23600 ksi	800°C (1470°F)
Modulus of Elasticity at Elevated Temperature	<u>174 GPa</u>	25200 ksi	700°C (1290°F)
Modulus of Elasticity at Elevated Temperature	<u>181 GPa</u>	26300 ksi	600°C (1110°F)
Modulus of Elasticity at Elevated Temperature	<u>188 GPa</u>	27300 ksi	500°C (930°F)
Modulus of Elasticity at Elevated Temperature	<u>197 GPa</u>	28600 ksi	400°C (750°F)
Modulus of Elasticity at Elevated Temperature	<u>204 GPa</u>	29600 ksi	300°C (570°F)
Modulus of Elasticity at Elevated Temperature	<u>214 GPa</u>	31000 ksi	200°C (390°F)
Modulus of Elasticity at Elevated Temperature	<u>222 GPa</u>	32200 ksi	100°C (212°F)
Charpy Impact	<u>262 J</u>	193 ft-lb	at RT, 148 J at -196°C (-320°F), 182 J at -138°C (-216°F), 212 J at -78°C (-108°F), 243 J at -29°C (-20°F), 297 J at 260°C (500°F), 273 J at 540°C (1000°F), 230 J at 650°C (1200°F), 194 J at 760°C (1400°F), 163 J at 870°C (1600°F), 144 J at 980°C (1800°F)

Electrical Properties

Electrical Resistivity	<u>8.86e-005 ohm-cm</u>	8.86e-005 ohm-cm	RT
Electrical Resistivity at Elevated Temperature	<u>0.0001011 ohm-cm</u>	0.0001011 ohm-cm	900°C (1650°F)
Electrical Resistivity at Elevated Temperature	<u>0.0001066 ohm-cm</u>	0.0001066 ohm-cm	700°C (1290°F)
Electrical Resistivity at Elevated Temperature	<u>0.0001078 ohm-cm</u>	0.0001078 ohm-cm	800°C (1470°F)
Electrical Resistivity at Elevated Temperature	<u>9.5e-005 ohm-cm</u>	9.5e-005 ohm-cm	1000°C (1830°F)

Thermal Properties

CTE, linear 20°C	<u>12.3 μm/m-°C</u>	6.83 μin/in-°F	25-100°C (77-212°F)
CTE, linear 250°C	<u>12.9 μm/m-°C</u>	7.17 μin/in-°F	25-200°C (77-390°F)
CTE, linear 500°C	<u>13.6 μm/m-°C</u>	7.56 μin/in-°F	25-300°C (77-570°F)
CTE, linear 500°C	<u>14.3 μm/m-°C</u>	7.94 μin/in-°F	25-500°C (77-930°F)
CTE, linear 500°C	<u>14.3 μm/m-°C</u>	7.94 μin/in-°F	25-400°C (77-750°F)
CTE, linear 1000°C	<u>14.6 μm/m-°C</u>	8.11 μin/in-°F	25-600°C (77-1110°F)
CTE, linear 1000°C	<u>15.1 μm/m-°C</u>	8.39 μin/in-°F	25-700°C (77-1290°F)
CTE, linear 1000°C	<u>15.8 μm/m-°C</u>	8.78 μin/in-°F	25-800°C (77-1440°F)
CTE, linear 1000°C	<u>16.5 μm/m-°C</u>	9.17 μin/in-°F	25-900°C (77-1650°F)
CTE, linear 1000°C	<u>17 μm/m-°C</u>	9.44 μin/in-°F	25-1000°C (77-1830°F)
Thermal Conductivity	<u>9.4 W/m-K</u>	65.2 BTU-in/hr-ft ² -°F	RT
Thermal Conductivity at Elevated Temperature	<u>10.9 W/m-K</u>	75.6 BTU-in/hr-ft ² -°F	100°C (212°F)
Thermal Conductivity at Elevated Temperature	<u>12.9 W/m-K</u>	89.5 BTU-in/hr-ft ² -°F	200°C (390°F)
Thermal Conductivity at Elevated Temperature	<u>14.8 W/m-K</u>	103 BTU-in/hr-ft ² -°F	300°C (570°F)

Thermal Conductivity at Elevated Temperature	16.8 W/m-K	117 BTU-in/hr-ft ² -°F	400°C (750°F)
Thermal Conductivity at Elevated Temperature	18.7 W/m-K	130 BTU-in/hr-ft ² -°F	500°C (930°F)
Thermal Conductivity at Elevated Temperature	20.7 W/m-K	144 BTU-in/hr-ft ² -°F	600°C (1110°F)
Thermal Conductivity at Elevated Temperature	22.6 W/m-K	157 BTU-in/hr-ft ² -°F	700°C (1290°F)
Thermal Conductivity at Elevated Temperature	24.7 W/m-K	171 BTU-in/hr-ft ² -°F	800°C (1470°F)
Thermal Conductivity at Elevated Temperature	26.7 W/m-K	185 BTU-in/hr-ft ² -°F	900°C (1650°F)
Thermal Conductivity at Elevated Temperature	29.2 W/m-K	203 BTU-in/hr-ft ² -°F	1000°C (1830°F)
Melting Point	1330 - 1410 °C	2430 - 2570 °F	
Solidus	1330 °C	2430 °F	
Liquidus	1410 °C	2570 °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.