

HAYNES® 617 alloy

CHEMISTRY: Weight %

Ni	Cr	Co	Mo	Fe	Ti	Al	C
54 ^a	22	12.5	9	1	0.3	1.2	0.07

^aAs balance

ALLOY DESCRIPTION:

HAYNES® 617 alloy is a nickel-chromium-cobalt-molybdenum alloy with a good combination of metallurgical stability, strength, and oxidation resistance at high temperatures. The alloy is readily formed and welded by conventional techniques. HAYNES 617 alloy is used in applications such as gas turbines for combustion cans, ducting, and transition lines. For modern applications, HAYNES®230® alloy should be considered as a replacement (ask for brochure H-3000).

PHYSICAL PROPERTIES:

	Temp., °F	British Units	Temp., °C	Metric Units
Density	Room	0.302 lb/in ³	Room	8.36 g/cm ³
Melting Range	2430-2510		1330-1375	
Thermal Conductivity	400	113 BTU-in/ft ² -hr-°F	200	16.1 W/m-K
	800	137 BTU-in/ft ² -hr-°F	430	19.5 W/m-K
	1000	149 BTU-in/ft ² -hr-°F	540	21.2 W/m-K
	1200	161 BTU-in/ft ² -hr-°F	650	23.0 W/m-K
	1400	173 BTU-in/ft ² -hr-°F	760	24.7 W/m-K
	1600	185 BTU-in/ft ² -hr-°F	870	26.4 W/m-K
Mean Coefficient of Thermal Expansion	70-800	7.6 µin/in-°F	20-430	13.6 µm/m-°C
	70-1000	7.7 µin/in-°F	20-540	13.8 µm/m-°C
	70-1200	8.0 µin/in-°F	20-650	14.4 µm/m-°C
	70-1400	8.4 µin/in-°F	20-760	15.1 µm/m-°C
	70-1600	8.7 µin/in-°F	20-870	15.6 µm/m-°C
	70-1800	9.0 µin/in-°F	20-980	16.1 µm/m-°C
Electrical Resistivity	70	48.1 µohm-in	20	122 µohm-cm
	400	49.5 µohm-in	200	126 µohm-cm
	800	50.3 µohm-in	400	128 µohm-cm
	1000	51.5 µohm-in	600	131 µohm-cm
	1200	52.4 µohm-in	700	133 µohm-cm
	1400	52.8 µohm-in	800	134 µohm-cm
	1600	52.7 µohm-in	900	134 µohm-cm

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DYNAMIC MODULUS OF ELASTICITY:

Temp., °F	10 ⁶ psi	Temp., °C	GPa	Temp., °F	10 ⁶ psi	Temp., °C	GPa
70	30.6	20	211	1200	24.6	700	166
400	29.0	200	201	1400	23.3	800	157
800	26.9	400	188	1600	21.9	900	149
1000	25.8	600	173	1800	20.5	1000	139

TYPICAL TENSILE PROPERTIES, PLATE:

Test Temperature		Ultimate Tensile Strength		0.2% Yield Strength		Elongation in 2 in (51mm)
°F	°C	Ksi	MPa	Ksi	MPa	%
ROOM	ROOM	113	779	53	367	52
1000	540	90	618	37	254	67
1200	650	91	627	35	239	67
1400	760	70	483	36	245	92
1600	870	41	286	30	207	99
1800	980	22	155	16	111	93
2000	1095	11	79	8	58	91

TYPICAL STRESS-RUPTURE STRENGTH, PLATE:

Test Temperature		Approximate Initial Stress, Ksi (MPa) to Produce Rupture in:					
°F	°C	100 Hours		1000 Hours		10,000 Hours	
1200	650	55.0	(379)	44.0	(303)	33.5	(231)
1400	760	29.0	(200)	19.5	(134)	14.5	(100)
1600	870	13.0	(90)	9.7	(67)	6.8	(47)
1800	980	6.6	(46)	4.1	(28)	2.5	(17)
1900	1040	4.1	(28)	2.5	(17)	-	-
2000	1095	2.5	(17)	1.4	(9.7)	-	-

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