

HASTELLOY[®] 242[®] alloy

CHEMISTRY: Weight %

Ni	Co	Fe	Cr	Mo	Mn	Si	Al	C	B	Cu
65 ^a	2.5 [*]	2 [*]	8	25	0.8 [*]	0.8 [*]	0.5 [*]	0.03 [*]	0.006 [*]	0.5 [*]

^a As Balance

^{*}Maximum

ALLOY DESCRIPTION:

HAYNES 242 alloy is an age-hardenable, nickel-base superalloy, which derives its strength from a long-range-ordering reaction upon aging, and is effective for use at temperatures up to about 1300°F (705°C). Coupled with the alloy's low thermal expansion characteristics, good oxidation resistance, and excellent aged ductility, 242 alloy's strength makes it highly suitable for applications in gas turbine engines, chemical process plants, and various industrial uses. As a cold-worked and directly-aged product, 242 alloy possesses excellent spring and fastener properties. Its excellent resistance to HF and fluoride environments recommends it for use in fluoropolymer production and processing equipment, and the alloy is also very resistant to most reducing aqueous acid media. 242 alloy may be either cold- or hot-formed, and it is readily weldable.

PHYSICAL PROPERTIES:

	Temp., °F	British Units	Temp., °C	Metric Units
Density	Room	0.327 lb/in ³	Room	9.05 g/cm ³
Melting Range	2350-2510		1290-1375	
Thermal Conductivity	400	96.1 BTU-in/ft ² -hr-°F	200	14.2 W/m-K
	600	108.5 BTU-in/ft ² -hr-°F	400	17.5 W/m-K
	800	120.9 BTU-in/ft ² -hr-°F	500	19.2 W/m-K
	1000	133.3 BTU-in/ft ² -hr-°F	600	20.9 W/m-K
	1200	145.7 BTU-in/ft ² -hr-°F	700	22.5 W/m-K
	1400	158.2 BTU-in/ft ² -hr-°F	800	24.2 W/m-K
Mean Coefficient of Thermal Expansion	70-400	6.3 μin/in-°F	20-200	11.3 μm/m-°C
	70-600	6.5 μin/in-°F	20-400	11.9 μm/m-°C
	70-800	6.7 μin/in-°F	20-500	12.2 μm/m-°C
	70-1000	6.8 μin/in-°F	20-600	12.3 μm/m-°C
	70-1200	6.9 μin/in-°F	20-700	13.0 μm/m-°C
	70-1400	7.7 μin/in-°F	20-800	14.0 μm/m-°C
Electrical Resistivity	400	49.3 μohm-in	200	125.1 μohm-cm
	600	50.0 μohm-in	400	128.0 μohm-cm
	800	50.6 μohm-in	500	129.5 μohm-cm
	1000	51.1 μohm-in	600	130.6 μohm-cm
	1200	51.7 μohm-in	700	132.0 μohm-cm
	1400	52.4 μohm-in	800	132.4 μohm-cm
	1600	51.3 μohm-in	900	129.8 μohm-cm

HEAT TREATMENT, SHEET AND STRIP:

1950°F (1065°C)/Bright Anneal + 1200°F (650°C)/24 hours/AC

HASTELLOY® 242® alloy

DYNAMIC MODULUS OF ELASTICITY:

Temp., °F	10 ⁴ psi	Temp., °C	GPa	Temp., °F	10 ⁴ psi	Temp., °C	GPa
70	33.2	20	229	1200	27.6	700	185
400	31.8	200	219	1400	25.7	800	172
800	29.7	400	206	1600	24.0	900	163
1000	28.6	600	193	1800	22.4	1000	152

TYPICAL TENSILE PROPERTIES, SHEET:

Test Temperature		Ultimate Tensile Strength		0.2% Yield Strength		Elongation in 2 in (51mm)
°F	°C	Ksi	MPa	Ksi	MPa	%
ROOM	ROOM	198	1365	135	930	31.8
400	205	188	1295	130	900	29.4
600	315	183	1260	124	855	36.4
800	425	176	1215	117	810	33.2
1000	540	169	1165	115	790	30.9
1200	650	152	1045	99	680	20.4
1300	705	125	860	91	625	15.7
1400	760	110	760	65	450	44.5
1600	870	65	445	39	265	32.9

TYPICAL STRESS-RUPTURE STRENGTH, SHEET:

Test Temperature		Approximate Initial Stress, Ksi (MPa) to Produce Rupture In:					
°F	°C	10 Hours		100 Hours		1000 Hours	
1000	540	140.0	(965)	133.0	(915)	123.0	(850)
1100	595	129.0	(890)	117.0	(805)	100.0	(690)
1200	650	111.0	(765)	93.0	(640)	66.0	(455)
1300	705	85.0	(585)	58.0	(400)	36.0	(250)
1400	760	40.0	(275)	26.0	(180)	15.0	(105)

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