

# HAYNES® 75 alloy

NOMINAL CHEMISTRY	Ni	Cr	Fe	Ti	Mn	Si	C
Weight Percent	76 <sup>a</sup>	20	5	0.4	1*	1*	0.15*

<sup>a</sup>As balance    \* Maximum

HAYNES alloy 75 is a solution-strengthened nickel-chromium alloy with moderate strength to 1200°F (650°C). It is principally used in low stress elevated temperature applications requiring reasonable oxidation resistance, and is approximately equivalent to alloy 600 in performance. Alloy 75 is used in a number of fabricated part applications in the gas turbine and aerospace industries in Europe, and is also employed in general industrial heating uses. The alloy is readily formed and fabricated using conventional techniques.

## PHYSICAL PROPERTIES:

	Temp., °F	British Units	Temp., °C	Metric Units
Density	Room	0.302 lb/in <sup>3</sup>	Room	8.37 g/cm <sup>3</sup>
Melting Range	2445-2515		1340-1380	
Thermal Conductivity	800	133 BTU-in/ft <sup>2</sup> -hr-°F	400	18.6 W/m-K
	1000	149 BTU-in/ft <sup>2</sup> -hr-°F	600	22.7 W/m-K
	1200	164 BTU-in/ft <sup>2</sup> -hr-°F	700	24.7 W/m-K
	1400	179 BTU-in/ft <sup>2</sup> -hr-°F	800	26.5 W/m-K
	1600	193 BTU-in/ft <sup>2</sup> -hr-°F	900	28.4 W/m-K
	1800	207 BTU-in/ft <sup>2</sup> -hr-°F	1000	30.1 W/m-K
Mean Coefficient of Thermal Expansion	70-800	7.9 µin/in-°F	20-500	14.3 µm/m-°C
	70-1000	8.2 µin/in-°F	20-600	15.0 µm/m-°C
	70-1200	8.5 µin/in-°F	20-700	15.4 µm/m-°C
	70-1400	8.9 µin/in-°F	20-800	16.5 µm/m-°C
	70-1600	9.4 µin/in-°F	20-900	17.1 µm/m-°C
	70-1800	10.3 µin/in-°F	20-1000	18.2 µm/m-°C
Electrical Resistivity	400	44.1 µohm-in	200	112 µohm-cm
	800	46.0 µohm-in	400	117 µohm-cm
	1000	45.5 µohm-in	600	115 µohm-cm
	1200	45.3 µohm-in	700	115 µohm-cm
	1400	45.3 µohm-in	800	115 µohm-cm
	1600	45.3 µohm-in	900	115 µohm-cm
	1800	45.6 µohm-in	1000	116 µohm-cm

## HEAT TREATMENT, SHEET AND STRIP:

1925°F (1050°C)/Bright Anneal

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## DYNAMIC MODULUS OF ELASTICITY:

Temp., °F	10 <sup>6</sup> psi	Temp., °C	GPa	Temp., °F	10 <sup>6</sup> psi	Temp., °C	GPa
70	32.0	20	221	1200	25.5	700	173
400	30.5	200	210	1400	24.6	800	165
800	28.2	400	197	1600	22.6	900	153
1000	27.0	600	181	1800	20.5	1000	140

## TYPICAL STRESS-RUPTURE STRENGTH, SHEET: 1925°F (1050°C) ANNEAL

Test Temperature		Ultimate Tensile Strength		0.2% Yield Strength		Elongation in 2 in (51mm)
°F	°C	Ksi	MPa	Ksi	MPa	%
Room	Room	114.4	792	59.4	407	31
1000	540	105.6	726	51.9	363	27
1200	650	69.3	473	40.0	275	32
1400	760	41.4	286	22.0	152	75
1600	870	20.2	139	9.9	68	90
1800	980	9.7	66	4.4	31	91

## TYPICAL STRESS-RUPTURE STRENGTH, SHEET: 1925°F (1050°C) ANNEAL

Test Temperature		Approximate Initial Stress, Ksi (MPa) to Produce Rupture in:					
°F	°C	10 Hours		100 Hours		1000 Hours	
1200	650	27.0	(185)	18.5	(130)	12.0	(83)
1300	705	16.0	(110)	10.2	(70)	6.8	(47)
1400	760	9.5	(66)	6.0	(41)	3.8	(26)
1500	815	5.8	(40)	3.7	(26)	2.2	(15)
1600	870	3.6	(25)	2.0	(14)	1.2	(8.3)

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