HIGH-TEMPERATURE
ALLOY AT A GLANCE

HAYNES International

HAYNES® 625SQ® alloy

CHEMISTRY: Weight %

Ni	Co	Fe	Cr	Mo	Cb+Ta	Mn	Si	N	Al	Ti	C
62[a]	1*	5*	21	9	3.7	0.5*	0.15*	0.02*	0.4*	0.4*	0.03*

[a]As balance * Maximum

ALLOY DESCRIPTION:

HAYNES 625SQ alloy is a solid-solution strengthened superalloy. It is a modification of HAYNES 625 alloy designed to enhance resistance to fatigue at temperatures up to approximately 1200°F (649°C). The alloy composition is tightly controlled to very low levels of carbon, silicon, and nitrogen. Primary melting is by vacuum induction melting, followed by consumable electrode practice using electroslag remelting. During processing, the grain size is controlled to ASTM #5 or finer. HAYNES 625SQ alloy sheet and strip meet the requirements of AMS 5879 and AMS 5599 specifications. HAYNES 625SQ alloy is readily fabricated and welded using practices common to HAYNES 625 alloy. HAYNES 625SQ alloy sheet and strip find application in aerospace, automotive, and chemical process industry bellows, expansion joints, and fabrications where fatigue resistance, strength, and corrosion resistance are required.

PHYSICAL PROPERTIES:

	Temp., °F	British Units	Temp., °C	Metric Units
Density	Room	0.305 lb/in³	Room	8.44 g/cm³
Melting Range	2350-2460		1290-1350	
Thermal Conductivity	800	109 BTU-in/ft²-hr-°F	400	15.3 W/m-K
	1000	121 BTU-in/ft²-hr-°F	600	18.3 W/m-K
	1200	132 BTU-in/ft²-hr-°F	700	19.8 W/m-K
	1400	144 BTU-in/ft²-hr-°F	800	21.5 W/m-K
	1600	158 BTU-in/ft²-hr-°F	900	23.4 W/m-K
	1800	175 BTU-in/ft²-hr-°F	1000	25.6 W/m-K
Mean Coefficient of Thermal Expansion	70-800	7.7 µin/in-°F	20-500	14.2 µm/m-°C
	70-1000	8.0 µin/in-°F	20-600	14.8 µm/m-°C
	70-1200	8.2 µin/in-°F	20-700	15.4 µm/m-°C
	70-1400	8.6 µin/in-°F	20-800	16.1 µm/m-°C
	70-1600	9.2 µin/in-°F	20-900	16.8 µm/m-°C
	70-1800	9.6 µin/in-°F	20-1000	17.4 µm/m-°C
Electrical Resistivity	400	52.8 µohm-in	200	134.0 µohm-cm
	800	53.5 µohm-in	400	135.6 µohm-cm
	1000	54.3 µohm-in	600	137.9 µohm-cm
	1200	54.3 µohm-in	700	137.5 µohm-cm
	1400	53.9 µohm-in	800	136.5 µohm-cm
	1600	53.5 µohm-in	900	135.6 µohm-cm
	1800	53.1 µohm-in	1000	134.8 µohm-cm

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DYNAMIC MODULUS OF ELASTICITY:

Temp.,°F	10^6 psi	Temp.,°C	GPa
70	30.2	20	208
400	28.8	200	199
800	26.7	400	186
1000	25.6	600	171
1200	24.3	700	163
1400	22.8	800	153
1600	21.2	900	142
1800	18.7	1000	126

TYPICAL TENSILE PROPERTIES, SHEET (AMS 5879):

Test Temperature		Ultimate Tensile Strength		0.2% Yield Strength		Elongation in 2 in (51mm)
°F	°C	Ksi	MPa	Ksi	MPa	%
ROOM	ROOM	129.9	895	65.5	452	51.7
600	315	117.4	809	51.1	353	64.1
800	425	112.6	776	49.1	339	60.9
1000	540	112.5	776	49.9	344	60.5
1200	650	114.2	787	46.9	323	81.4
1300	705	93.7	646	44.4	306	103.9
1400	760	72.1	497	46.9	323	88.8

HEAT TREATMENT, SHEET AND STRIP (AMS 5879):

1600°F (871°C) Minimum/Bright Anneal

HAYNES International
1020 W. Park Avenue P.O. Box 9013 Kokomo, Indiana USA 46904-9013
Telephone: 765-456-6012 800-354-0806 FAX: 765-456-6905 haynesintl.com