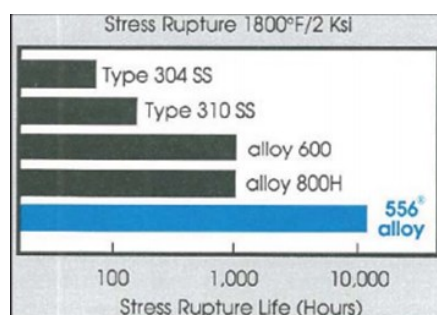
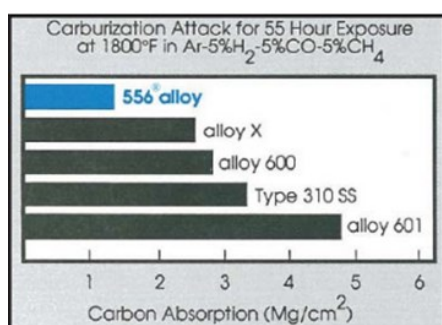


HAYNES[®] 556[®] alloy for Industrial Heating Applications Tech Brief

For Industrial Heating & Heat Training Applications

For high-strength heat-treating furnace fans, brazing fixtures, and other critical components that require resistance to high-temperature aggressive environments coupled with excellent strength and fabricability, the first choice is HAYNES[®] 556[®] alloy. 556[®] alloy has the best combination of carburization resistance, strength, and oxidation-resistance for high speed carburizing furnace fan applications to 2000°F. It is also well considered for heavy duty chains, baskets and T/C protection tubes in such facilities. In high temperature brazing furnace applications, 556[®] alloy provides the same excellent strength coupled with resistance to fluxing compounds, salts, and other corrosive species. For nested tables, vacuum brazing fixtures, and baskets, and hardware of all types, 556[®] alloy provides premier capabilities compared with traditional stainless steels and industrial heating alloys.



Resistance to Corrosion in Molten 100% NaCl for 100 Hours at 1550°F	
Alloy	Average Metal Affected Mils
-	Mils
556 [®]	2.6
X	3.8
310	4.2
800H	4.3
625	4.4
RA330 [®]	4.6
RA333 [®]	7.5
600	7.7

Nominal Composition	
Element	Percentage
Iron:	Balance
Nickel:	20
Cobalt:	18
Chromium:	22
Molybdenum:	3
Tungsten:	2.5
Tantalum:	0.6
Nitrogen:	0.2
Silicon:	0.4
Manganese:	1
Aluminum:	0.2
Carbon:	0.1
Lanthanum:	0.02
Zirconium:	0.02

Typical Tensile Properties, Plate

Test Temperature		0.2% Yield Strength		Ultimate Tensile Strength		Elongation
°F	°C	ksi	MPa	ksi	MPa	%
RT	RT	55	375	116	805	51
1000	540	31	210	90	625	60
1200	650	31	210	83	575	57
1400	760	29	200	69	470	53

1600	870	28	190	49	340	69
1800	980	19	130	31	210	84
2000	1095	9	60	16	110	95

Typical Rupture Properties, Plate

Test Temperature		Typical Rupture Properties: Stress Required to Produce Rupture in Hours Shown					
		100 h		1,000 h		10,000 h	
°F	°C	ksi	MPa	ksi	MPa	ksi	MPa
1400	760	25.0	172	17.5	121	11.9	98
1500	815	17.0	117	11.8	81	7.8	43
1600	870	11.5	79	7.5	52	4.9	34
1700	915	7.6	52	4.8	33	3.0	21
1800	980	4.8	33	3.0	21	1.9	13

Typical Room Temperature Physical Properties

Physical Property	British Units	Metric Units
Density	0.297 lb/in ³	8.23 g/cm ³
Electrical Resistivity	37.5 μohm-in	95.2 μohm-cm
Modulus of Elasticity	29.7 x 10 ⁶ psi	206 GPA
Thermal Conductivity	77 Btu-in/ft ² -h-°F	11.1 W/m-°C
Specific Heat	0.111 Btu/lb-°F	464 J/Kg-°C

Environmental Resistance

Oxidation in Air - Excellent at 2000°F (1095°C)

Sulfidation - Second only to Co-base alloys

Molten Chloride Salts - Equal to alloy X

Chlorination - Very good to 1650°F (900°C)

Carburization - Equal to alloy 800H

Molten Zinc - Best Available

Product Description

HAYNES[®] 556[®] alloy is an iron-nickel-chromium-cobalt alloy that combines effective resistance to sulfidizing, carburizing, and chlorine-bearing environments at high temperatures with good oxidation resistance, fabricability, and excellent high-temperature strength. It has also been found to resist corrosion by molten chloride salts and molten zinc.

HAYNES[®] 556[®] alloy is highly useful for service at elevated temperature in moderately to severely corrosive environments. Applications include tubing and structural members in waste heat recuperators, super heaters, and internals in municipal and chemical waste incinerators; power plant burner buckets, cair nozzles, and fluidized bed combustor heat exchangers and internals; high speed furnace fans, galvanizing bath hardware and brazing fixtures; and high-temperature rotary calciners and kilns. There are also additional uses in the chemical petrochemical process and pump and paper industries.