

## Haynes Hastelloy® N, 1.14 mm sheet, aged 10000 hours at 593°C (1100°F)

Category : Metal , Nonferrous Metal , Nickel Alloy , Superalloy

### Material Notes:

Applications include containers for molten fluoride salts. Good oxidation resistance to hot fluoride salts at 705-870°C (1300-1600°F), good oxidation resistance in air. Data provided by the manufacturer, Haynes International, Inc.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_Haynes-Hastelloy-N-114-mm-sheet-aged-10000-hours-at-593C-1100F.php](http://www.lookpolymers.com/polymer_Haynes-Hastelloy-N-114-mm-sheet-aged-10000-hours-at-593C-1100F.php)

Physical Properties	Metric	English	Comments
Density	8.86 g/cc	0.320 lb/in <sup>3</sup>	

Mechanical Properties	Metric	English	Comments
Tensile Strength, Ultimate	827 MPa	120000 psi	
	624 MPa @Temperature 593 °C	90500 psi @Temperature 1100 °F	at 593°C after aging
Tensile Strength, Yield	328 MPa @Strain 0.200 %	47600 psi @Strain 0.200 %	
	Elongation at Break	49 %	49 %
46 % @Temperature 593 °C		46 % @Temperature 1100 °F	in 50.8 mm at 538°C after aging
Modulus of Elasticity	122 GPa @Temperature 1049 °C	17700 ksi @Temperature 1920 °F	
	136 GPa @Temperature 1000 °C	19700 ksi @Temperature 1830 °F	
	143 GPa @Temperature 954 °C	20700 ksi @Temperature 1750 °F	
	151 GPa @Temperature 904 °C	21900 ksi @Temperature 1660 °F	
	157 GPa @Temperature 854 °C	22800 ksi @Temperature 1570 °F	
	163 GPa @Temperature 800 °C	23600 ksi @Temperature 1470 °F	

Mechanical Properties	171 GPa Metric	24800 ksi English	Comments
	@Temperature 700 °C	@Temperature 1290 °F	
	181 GPa	26300 ksi	
	@Temperature 577 °C	@Temperature 1070 °F	
	181 GPa	26300 ksi	
	@Temperature 632 °C	@Temperature 1170 °F	
	187 GPa	27100 ksi	
	@Temperature 500 °C	@Temperature 932 °F	
	192 GPa	27800 ksi	
	@Temperature 410 °C	@Temperature 770 °F	
	202 GPa	29300 ksi	
	@Temperature 221 °C	@Temperature 430 °F	
	219 GPa	31800 ksi	
	@Temperature 14.0 °C	@Temperature 57.2 °F	

Thermal Properties	Metric	English	Comments
CTE, linear	12.3 µm/m-°C	6.83 µin/in-°F	
	@Temperature 21.0 - 316 °C	@Temperature 69.8 - 601 °F	
	12.7 µm/m-°C	7.06 µin/in-°F	
	@Temperature 21.0 - 427 °C	@Temperature 69.8 - 801 °F	
	13.4 µm/m-°C	7.44 µin/in-°F	
	@Temperature 21.0 - 538 °C	@Temperature 69.8 - 1000 °F	
	14.0 µm/m-°C	7.78 µin/in-°F	
	@Temperature 21.0 - 649 °C	@Temperature 69.8 - 1200 °F	
	14.7 µm/m-°C	8.17 µin/in-°F	
	@Temperature 21.0 - 760 °C	@Temperature 69.8 - 1400 °F	
	15.3 µm/m-°C	8.50 µin/in-°F	
	@Temperature 21.0 - 871 °C	@Temperature 69.8 - 1600 °F	
	15.8 µm/m-°C	8.78 µin/in-°F	

Thermal Properties	Metric @ Temperature 21.0 - 982 °C	English @ Temperature 69.8 - 1800 °F	Comments
Specific Heat Capacity	0.419 J/g-°C	0.100 BTU/lb-°F	
	@Temperature 100 °C	@Temperature 212 °F	
	0.440 J/g-°C	0.105 BTU/lb-°F	
	@Temperature 200 °C	@Temperature 392 °F	
	0.456 J/g-°C	0.109 BTU/lb-°F	
	@Temperature 300 °C	@Temperature 572 °F	
	0.469 J/g-°C	0.112 BTU/lb-°F	
	@Temperature 400 °C	@Temperature 752 °F	
	0.477 J/g-°C	0.114 BTU/lb-°F	
	@Temperature 480 °C	@Temperature 896 °F	
	0.485 J/g-°C	0.116 BTU/lb-°F	
	@Temperature 540 °C	@Temperature 1000 °F	
	0.523 J/g-°C	0.125 BTU/lb-°F	
	@Temperature 570 °C	@Temperature 1060 °F	
	0.565 J/g-°C	0.135 BTU/lb-°F	
@Temperature 590 °C	@Temperature 1090 °F		
0.578 J/g-°C	0.138 BTU/lb-°F		
@Temperature 680 °C	@Temperature 1260 °F		
0.578 J/g-°C	0.138 BTU/lb-°F		
@Temperature 700 °C	@Temperature 1290 °F		
0.582 J/g-°C	0.139 BTU/lb-°F		
@Temperature 660 °C	@Temperature 1220 °F		
0.586 J/g-°C	0.140 BTU/lb-°F		
@Temperature 620 °C	@Temperature 1150 °F		
Thermal Conductivity	11.5 W/m-K	79.8 BTU-in/hr-ft <sup>2</sup> -°F	RT
	13.1 W/m-K	90.9 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 100 °C	@Temperature 212 °F	
13.1 W/m-K	90.9 BTU-in/hr-ft <sup>2</sup> -°F		
@Temperature 200 °C	@Temperature 392 °F		

Thermal Properties	Metric	English	Comments
	@Temperature 300 °C	@Temperature 572 °F	
	16.5 W/m-K	115 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 400 °C	@Temperature 752 °F	
	18.0 W/m-K	125 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 500 °C	@Temperature 932 °F	
	20.3 W/m-K	141 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 600 °C	@Temperature 1110 °F	
	23.6 W/m-K	164 BTU-in/hr-ft <sup>2</sup> -°F	
	@Temperature 700 °C	@Temperature 1290 °F	
Melting Point	1300 - 1400 °C	2370 - 2550 °F	
Solidus	1300 °C	2370 °F	
Liquidus	1400 °C	2550 °F	

Component Elements Properties	Metric	English	Comments
Al + Ti	<= 0.50 %	<= 0.50 %	
Carbon, C	<= 0.080 %	<= 0.080 %	
Chromium, Cr	7.0 %	7.0 %	
Cobalt, Co	<= 0.20 %	<= 0.20 %	
Copper, Cu	<= 0.35 %	<= 0.35 %	
Iron, Fe	<= 5.0 %	<= 5.0 %	
Manganese, Mn	<= 0.80 %	<= 0.80 %	
Molybdenum, Mo	16 %	16 %	
Nickel, Ni	71 %	71 %	
Silicon, Si	<= 1.0 %	<= 1.0 %	
Tungsten, W	<= 0.50 %	<= 0.50 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.000120 ohm-cm	0.000120 ohm-cm	RT
	0.000124 ohm-cm	0.000124 ohm-cm	

Electrical Properties	Metric	English	Comments
	@Temperature 815 °C	@Temperature 1500 °F	
	0.000126 ohm-cm	0.000126 ohm-cm	
	@Temperature 705 °C	@Temperature 1300 °F	

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