

Carpenter Invar 36® Alloy, Cold Rolled Strip

Category : Metal , Electronic/Magnetic Alloy , Superalloy , Iron Base

Material Notes:

Data provided by Carpenter Technology Corporation. Carpenter Invar "36" alloy is a 36% nickel-iron alloy possessing a rate of thermal expansion approx. one-tenth that of carbon steel up to 200°C. This alloy has been used for applications where dimensional changes due to temperature variation must be minimized, such as in radio and electronic devices, aircraft controls, optical and laser systems, etc. This alloy has also been used in conjunction with high expansion alloys where a motion is desired when the temperature changes, such as in bimetallic thermostats and in rod and tube assemblies for temperature regulators. Invar 36® is a registered trademark of Carpenter Technology Corporation.

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http://www.lookpolymers.com/polymer_Carpenter-Invar-36-Alloy-Cold-Rolled-Strip.php

Physical Properties	Metric	English	Comments
Density	8.05 g/cc	0.291 lb/in ³	

Mechanical Properties	Metric	English	Comments
Hardness, Rockwell B	98	98	
Tensile Strength, Ultimate	717 MPa	104000 psi	
Tensile Strength, Yield	679 MPa @Strain 0.200 %	98500 psi @Strain 0.200 %	
Elongation at Break	5.5 %	5.5 %	in 50.8 mm
Modulus of Elasticity	148 GPa	21500 ksi	

Thermal Properties	Metric	English	Comments
CTE, linear	1.30 µm/m-°C	0.722 µin/in-°F	
	@Temperature 93.0 °C	@Temperature 199 °F	
	4.18 µm/m-°C	2.32 µin/in-°F	
	@Temperature 260 °C	@Temperature 500 °F	
	7.60 µm/m-°C	4.22 µin/in-°F	
	@Temperature 371 °C	@Temperature 700 °F	
Specific Heat Capacity	0.515 J/g-°C	0.123 BTU/lb-°F	
Thermal Conductivity	10.15 W/m-K	70.44 BTU-in/hr-ft ² -°F	
Melting Point	1427 °C	2601 °F	

Solidus Thermal Properties	1427 °C Metric	2601 °F English	Melting Point Comments
Liquidus	1427 °C	2601 °F	Melting Point

Component Elements Properties	Metric	English	Comments
Carbon, C	0.020 %	0.020 %	
Iron, Fe	63 %	63 %	as remainder
Manganese, Mn	0.35 %	0.35 %	
Nickel, Ni	36 %	36 %	
Silicon, Si	0.20 %	0.20 %	

Electrical Properties	Metric	English	Comments
Electrical Resistivity	0.0000820 ohm-cm	0.0000820 ohm-cm	Temperature Coefficient = 0.0011
Curie Temperature	279 °C	534 °F	

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