

INVAR 36 is a nickel-iron, low-expansion alloy containing 36% nickel. It maintains nearly constant dimensions over the range of normal atmospheric temperatures, and has a low coefficient of expansion from cryogenic temperatures to about 500°F. The alloy also retains good strength and toughness at cryogenic temperatures.

INVAR 36 can be hot and cold formed and machined using processes similar to austenitic stainless steels. INVAR 36 is weldable using Filler Metal CF36 which is available in bare wire for both the GTAW and GMAW process.

Specifications

UNS: K93600, K93603 W. Nr./EN: 1.3912 ASTM: F 1684-06 AFNOR: NF A54-301 (chemistry only)

Chemical Composition, %

	Ni	Fe	Mo	C	Cu	Mn	Si	P	S	Cr
MIN	35.0	—	—	—	—	—	—	—	—	—
MAX	37.0	balance	0.5	0.1	0.5	0.6	0.35	0.025	0.025	0.5

Features

- Low expansion rate up to 500°F
- Readily weldable

Applications

- Tooling and dies for composite forming
- Cryogenic components
- Laser components

Physical Properties

Density: 0.293 lb/in³ Melting Point: 2605°F Electrical Conductivity: 69.3 Btu • ft / ft² • hr • °F

Temperature, °F	-328	-148	212	302	392	482	572	662	752	842	932
Coefficient* of Thermal Expansion, in/in°F x 10 ⁻⁶	0.8	0.7	0.8	1.1	1.4	1.9	3.1	4.0	4.7	5.2	5.6

* 70°F to indicated temperature.

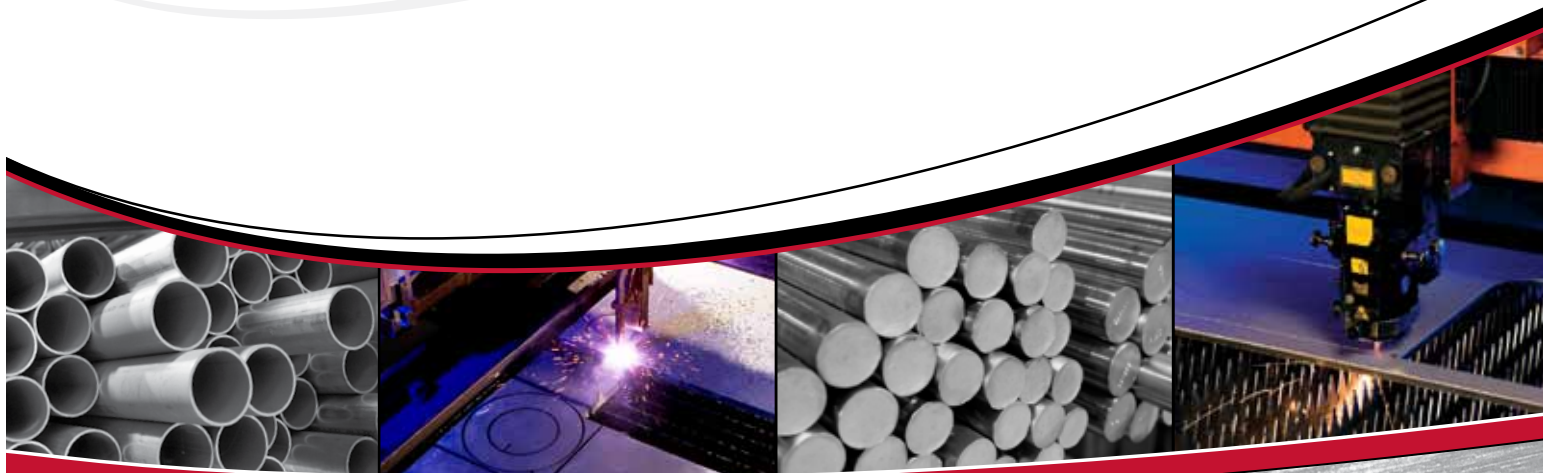
Mechanical Properties

Typical Tensile Properties

Temperature, °F	68	212	392	572	752	932	1112
Ultimate Tensile Strength, ksi	71	62	62	59	51	42	30
0.2% Yield Strength, ksi	35	26	16	13	13	13	11
Elongation, %	42	43	45	48	53	59	68



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