

INVAR 36

Controlled Expansion Alloys



Description

Consisting of 36% Nickel, and the balance Iron, Invar 36[®] has very low expansion characteristics around ambient temperatures, and is often used where minimum expansion is required.

AKA: Invar 36[®] Alloy, Pernifer[®] 36, NILO[®] 36, Invar[®] Steel.

Applications

Optoelectronics, optical and laser benches, electronics, scientific instruments, precision tooling.

PHYSICAL PROPERTIES

Density	8.05g/cm ³
Specific gravity	8.05
Curie temperature	279°C
Melting point	1427°C
Electrical resistivity	84 microhm-cm
Thermal conductivity	0.10 W/mK
Specific heat	0.51 J/g°C

MECHANICAL PROPERTIES

Tensile strength	518 MPa
Yield strength	276 MPa
Elongation	34%
Hardness	80 HRB
Modulus of elasticity	141 kMPa

LINEAR COEFFICIENT OF PHYSICAL THERMAL EXPANSION

Temperature °C	Temperature CTE (ppm/°C)
30-100	1.18
30-150	1.72
30-200	1.72
30-250	2.53
30-300	4.92
30-350	6.60
30-400	7.82
30-450	8.82
30-500	9.72
30-600	11.35
30-700	12.70
30-800	13.45
30-900	13.85

FORMS AVAILABLE:



Coil



Sheet



Plate



Rod



Bar



Wire

All information is presented in good faith and based on published details. Nicofe Ltd is not responsible for the accuracy of this information or the suitability of the material for a particular application.

SPECIFICATIONS

ASTM	F1684
MIL	1-23011 CL7
AMS	1-23011 CL7
UNS	K93603

CHEMISTRY

28 Nickel Ni 58.6934	36%
27 Cobalt Co 58.933	0.05%
26 Iron Fe 55.847	Balance
C	0.05%
Si	0.40%
S	0.015%
Cr	0.25%

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More than just metal

We're one of Europe's leading suppliers of premium quality refractory metals and alloys, soft magnetic alloys, and controlled expansion alloys. We hold a large stock of UK-certified, materials, all with full chain custody. With a deep technical understanding, comprehensive workshop facilities, and top accreditations, we help our customers get more from their materials.

Knowledge and advice

Our team understands exactly how our products are made, how they will behave in different situations, and how they should perform. Their knowledge and expertise helps save time, effort and cost by ensuring that all materials are sourced, processed and tested to perform in the most effective way.

We partner with leading academic institutions and scientific organisations that add value to our service and help develop solutions to the challenges impacting our customers. We're keen to share these unique insights in order to deliver practical operational improvements.

Workshop and machining

Our purpose-built facilities are centred around a fully equipped workshop designed to address almost any customer request:

- CNC Proturn RLX 1630 lathe for high precision rod and bar processing
- Saws to cut bars, plate and billets from Ø 2mm to Ø 270mm
- Guillotines for sheet and coil
- Grinding machinery
- De-coiler to check for imperfections before shipping
- Coil handling equipment to inspect product before dispatch
- Water jet and laser cutting
- Heat treatments

Quality control

All orders are fully tested before shipping.

Our state-of-the-art metrology lab features:

- Micrometers, verniers and gauges for all applications
- Surface roughness tester
- Straightness and roundness testing apparatus
- Magnetometers for measuring inductance, coercive and saturation
- Capabilities for evaluating properties such as CTE, tensile and elongation.

Best practice

We are committed to continuous improvement, reflected in our achievement of internationally-recognised industry accreditations. These are the foundation of best practice and provide you with solid assurances of competence and integrity:

- **AS9120** certified – a top aerospace industry award.
- **Green Mark level 1** accreditation – an environmental certification that supports greater sustainability.
- **JOSCAR** (the Joint Supply Chain Accreditation Register) accredited – an award that helps to streamline procurement processes.
- **Cyber Essentials** certified – a government-backed programme that provides security assurance of a supplier's digital infrastructure.



Discover how we can **optimise** operational performance

Contact chris@nicofe.com



Nicofe Materials

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