Nickel Alloy Technical Datasheet

Invar 36 Plate, Bar, Coil, and Tube

UNS K93600 / Invar Metal Alloys

Invar 36 is a nickel-iron controlled expansion alloy used where dimensional stability is critical across temperature changes.

Grade	Invar 36
UNS / reference	UNS K93600
Alloy family	Invar Metal Alloys
Available forms	plate, bar, coil, tube
Primary use	RFQ preparation, grade comparison, product-form selection, certificate planning
Revision	2026-06-11

General Description

This document presents Invar 36 in a concise technical format for nickel alloy raw material buyers. It follows the style of established alloy data bulletins: grade identity first, followed by standards, composition review, supply forms, engineering reference tables, fabrication notes, and RFQ checkpoints.

- Very low coefficient of thermal expansion near room temperature
- Good dimensional stability for precision systems
- Often requested as plate, sheet, bar, and coil

Standards and Specification References

Common references include ASTM F1684, ASTM B753, AMS 2300 series requirements where specified, and precision project specifications.

Final chemistry, mechanical values, heat treatment, testing, and acceptance criteria must be confirmed against the active standard, mill certificate, and customer specification.

Composition and Product Forms

Chemical Review and Supply Matrix

Principal Alloying Elements

Element	Level / role	Procurement meaning
Fe-Ni	Base system	Controlled thermal expansion behavior
Co	Kovar-specific	Glass-to-metal and ceramic-to-metal sealing behavior
C, Mn, Si	Controlled minor	Thermal expansion and processing control
S, P	Low residuals	Confirmed by applicable standard
Balance	Specification controlled	Use certified chemistry for design release

Raw Material Form Matrix

Form	RFQ dimensions	Grade-specific review note
Plate	Thickness, width, length, surface, flatness, tolerance, piece quantity	Invar 36 plate and sheet inquiries are checked by thickness, surface, tolerance, and heat treatment condition.
Bar	Diameter/section, length, straightness, condition, bundle quantity	Invar 36 bar inquiries are checked by diameter or section size, delivery condition, and test certificate scope.
Coil	Thickness, width, edge, coil ID, coil weight, surface finish	Invar 36 coil and strip inquiries are checked by width, thickness, edge, coil ID, and surface finish.
Tube	OD, wall thickness, length, route, end condition, NDE/test scope	Invar 36 tube inquiries are checked by OD, wall thickness, length, standard, and test requirements.

Documents to Confirm

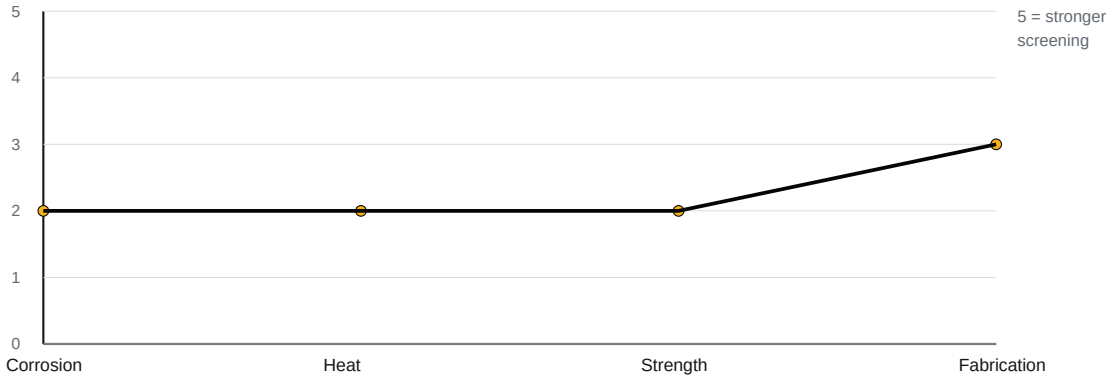
Item	Typical record
MTC	EN 10204 3.1 / mill certificate when required
Traceability	Heat number, lot, size, product form, quantity, condition
Dimensional report	Thickness, OD/WT, diameter, width, length, tolerance as applicable
Additional tests	PMI, NDE, hydro, hardness, corrosion test, third-party inspection when specified

Engineering Reference

Properties, Temperature, and Screening Notes

Relative Property Profile

Figure 1 - Relative property profile for RFQ screening



Relative guide only; do not use as design allowable data.

Modulus / Elevated Temperature Data Format

The table below shows the recommended format for reviewing modulus and temperature-dependent data. Use certified grade-specific data from standards, producer bulletins, or project specifications for design calculations.

Temp	Tension modulus	Shear modulus	Poisson ratio	Use note
Room	High / grade dependent	High / grade dependent	Verify	Baseline for procurement screening
Moderate	Reduced vs. room temp	Reduced vs. room temp	Verify	Check code allowables and condition
Elevated	Further reduction	Further reduction	Verify	Use design standard, not this guide

Room-Temperature Mechanical Data Review

Data item	How it should be handled
Tensile strength	Confirm by form, size, condition, and applicable ASTM/ASME/EN/AMS standard
Yield strength	Confirm 0.2% offset or specified method in the purchase standard
Elongation	Confirm gauge length, test direction, and product form
Hardness	Use only when required by standard, order, or project inspection plan

Fabrication and Corrosion Review

Fabrication Notes and Service Screening

Welding / Joint Preparation

Figure 2 - Typical weld preparation review points

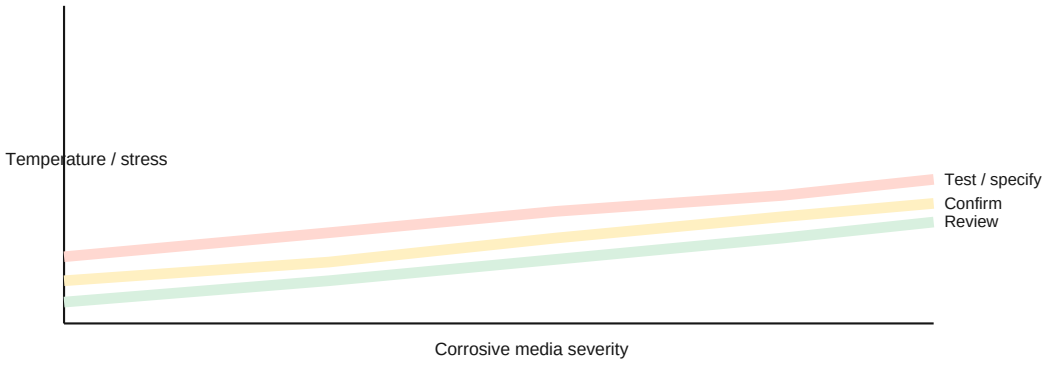
Joint design must follow qualified WPS/PQR, applicable code, and customer specification.

Fabrication Notes

- Cleanliness, filler metal selection, heat input, interpass temperature, and post-weld requirements must be controlled by qualified procedure.
- Cold work, solution treatment, annealing, or age-hardening response depends on the exact alloy grade and product form.
- For plate, bar, coil, and tube RFQs, include surface condition, tolerance, straightness or flatness, and inspection scope.

Corrosion Selection Map

Figure 3 - Corrosion service screening map



Use corrosion testing, published alloy data, and project media details for final selection.

Applications and RFQ Checklist

Invar 36 Application Review

Common Application Areas

Application area	Typical material question
Precision instruments	Confirm grade, product form, standard, condition, dimensions, and document package.
Aerospace tooling	Confirm grade, product form, standard, condition, dimensions, and document package.
Optical and measuring systems	Confirm grade, product form, standard, condition, dimensions, and document package.
Electronics support structures	Confirm grade, product form, standard, condition, dimensions, and document package.
Project-specific raw material procurement	Confirm grade, product form, standard, condition, dimensions, and document package.
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RFQ Checklist

Step	RFQ field	Required detail
1	Alloy grade	Invar 36 plus UNS / ASTM / EN / AMS reference if available
2	Product form	Plate, bar, coil, tube, or another published product form
3	Dimensions	Thickness, width, length, diameter, OD, wall thickness, edge, tolerance
4	Condition	Annealed, solution treated, aged, cold worked, pickled, polished, or project-specific
5	Quantity and logistics	Pieces, weight, delivery term, destination, packaging, project schedule
6	Documents	MTC, inspection scope, third-party inspection, and customer specification

Use Limitation

This datasheet is a sourcing and quotation aid. It is not a controlled design standard and does not replace producer data, engineering code requirements, customer specifications, or mill-issued certificates.

Website	www.nickelcasting.com
Inquiry	Send grade, form, dimensions, standard, quantity, destination, and certificate requirements.
Grade URL	/nickel-alloys/invar-metal-alloys/invar-36/