

Zapp SuperClean Invar 36 Datasheet

Technical Specification for 100 µm Open Mask



Zapp is Certified to ISO 9001

Iron-nickel foil with dimensional stability

Iron-nickel precision foils made Zapp SuperClean Invar 36* exhibit tightest thickness tolerances, are free from waves and at the same time internal stresses.

*Invar is a registered trademark of Aperam Alloys Imphy

Applications

Zapp precision foils of Zapp SuperClean Invar 36 are used for various applications in the electronic industry either as stencils or masks for the production of electric devices, or in the appliances themselves. They are furthermore used in bi-metals, as sealings between glass and metals, in clocks and laser systems. The patterning of masks is usually carried out by photochemical machining. During this process material is removed to produce through apertures. In order to maintain the desired shape and tolerances after the etching process, internal stresses must be eliminated. Furthermore, the low thermal expansion and its tight control allows the use of Zapp SuperClean Invar 36 over a large temperature range, even in combination with other materials.

Dimension

Thickness [µm]	Thickness tolerance [µm]	Width [mm]	Width tolerance [mm]
100	± 10	600	+ 1

Shape

The shape accuracy of our Zapp SuperClean Invar 36 precision foils is such that periodical patterns below 30 micrometres can easily be produced by photochemical machining. The combination of our know-how and modern equipment enables us to produce excellent flatness and tight tolerances:

- Camber, max. 1.00 mm/m
- Coil set, 20 mm measured as a 500 mm long free hanging sample
- Hanging crossbow ≤ 25 mm
- Waviness according to table

Zapp SuperClean Invar 36 is an iron-nickel alloy with 36 % nickel content.

Chemical analysis (weight %)

	Ni	C	Cr	Mn	S	Si	Fe
min.	35.5	-	-	-	-	-	bal.
max.	36.5	0.02	0.10	1.00	0.02	0.30	bal.

Mechanical properties

The foils are delivered in the work-hardened condition.

Alloy	Ultimate Tensile Strength [MPa]	Elongation [%]	Hardness [HV _{0.5}]
min.	550	-	180
max.	800	< 20 %	220

* typical values, intermediate values possible

Surface

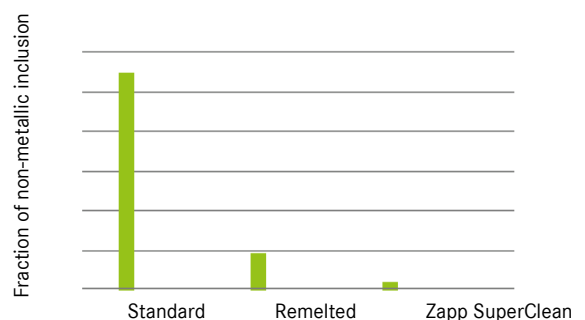
Periodic defects > 3 µm in depth are not allowed. Only 3 non-periodic defects > 3 µm in depth are allowed per 1 m of strip checked at the end of the strip.
Surface roughness: Ra ≤ 0.15 µm

Cleanness

The primary metallurgy is optimised to achieve the best possible cleanness.

Tight process control and sampling is applied to deliver the optimum right material for the typical demands in the microelectronic industry.

Cleanness of Zapp SuperClean Invar 36 foils freedom from non-metallic inclusions



Finish

- Cold rolled and tension annealed

The tension annealed material is recommended for photochemical machining processes and for operations at elevated temperatures, where dimensional stability is essential for the production of patterns or components. Internal stress assessed by curl test after 50 % material removal: maximum deviation 10 mm on flat table.

Edges

- Slit

Waviness

Thickness [µm]	Width [mm]	Rolling direction [I-Units]		Transverse direction [mm]
		Center (500)	edge (rest)	
100	600	3	20	5

A center area of 500 mm width will be lower than 3 I-Units in flatness.

Physical properties

Thermal expansion coefficient between 20 and 100 °C:
 $0.8 \times 10^{-6}/K \leq a \leq 1.6 \times 10^{-6}/K$.

Delivery form and finish

- Coil

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Further information regarding our products and locations are available in our image brochure and under www.zapp.com

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