L.KLEIN SA
PREMIUM STEEL & METALS
SINCE 1946



ARCAP ZEST

CuNi25Zn14.5 – Lead-Free Free-Cutting Nickel Silver

Distinctive feature and main attributes

ARCAP ZeST alloy is a lead-free, corrosion-resistant free-cutting nickel silver. It is alloyed to improve machining efficiency by increasing the service life of cutting tools. High cutting speeds of up to 150 m/min can be achieved, depending on the machine, tools, etc. Very smooth machined surfaces can be obtained using diamond tools. This grade of nickel silver allows burr-free drilling.

Use and application ranges

ARCAP ZeST nickel silver is used for the manufacture of connectors, eyewear frames, and a wide range of automatic screw machining and turned-part applications. Typical applications include watchmaking micro-components, fibre-optic connectors, and shielding components for aerospace instrumentation.

Norms

Material No. ARCAP ZEST
EN CuNi25Zn14.5

Chemical composition (% wt)

Cu	Ni	Mn	Pb	Sn	Fe	Zn	Others (incl. Te)
59.0 – 63.0	23.0 – 26.0	max. 0.50	< 0.01	max. 0.60	max. 0.25	balance	

Dimensions and tolerances

- Bars: rondes
- Bars Ø < 24.0: 3 m, length tolerance - 0 / + 50 mm
- Bars Ø 25.0 – 29.0 2.5 m
- Bars Ø 30.0 – 32.0 mm: 2.0 m
- Wire Ø max. 2.5 mm: coils for Escomatic machines

Mechanical properties

Bars and Wire			
Condition: Cold Drawn	Hv	Rm (MPa)	A_{100} (%)
Ø < 2.5 mm		550 – 650	≥ 2
2.5 ≤ Ø < 5 mm	4 / 4 dur	600 – 750	≥ 2
5 ≤ Ø < 12 mm		550 – 650	≥ 2
Ø > 12 mm	hardness testing only		
12 ≤ Ø 35 mm	hard ≥ 160		

Availability

Standard dimensions on stock: see product range

Machining

In most applications, ARCAP ZeST nickel silver is machined in the cold-worked condition, providing the final mechanical strength of the finished component.
Machinability: Good to very good
Cutting speeds: V_c up to 150 m / min
Cutting oil/lubricant: Selection according to application requirements
Optimum cutting conditions depend on the machine tool, cutting tools, chip size, lubricant, and the required tolerances and/or surface finish.

Modifications will not be adjusted automatically. Last update 06 / 2026

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Annealing **Soft condition:** 750°C / 15 – 60 min, under a protective atmosphere
Stress relieving: max. 250°C, under a protective atmosphere

Hardening ARCAP ZeST nickel silver cannot be hardened by heat treatment.

Cold Working and Forming ARCAP ZeST nickel silver can be significantly strengthened by cold working and cold forming.

Microstructure ARCAP ZeST nickel silver exhibits a single-phase microstructure in all metallurgical conditions.

Lasermarking **Lasermarking:** Well suited
The heat generated during laser marking, and particularly in the event of excessive heating, may cause zinc loss through selective evaporation. In certain cases, this loss may reduce both the local mechanical properties and the corrosion resistance of the melted zone within the marked area.

Brazing **Hard condition:** Well suited
Soft condition: Well suited

Adhesive Bonding Generally well suited

Welding **Gas:** medium
Arc: medium
Laser: excellent
Electron beam: excellent
TIG: excellent
MIG: medium
Resistance: good

- The heat generated during welding may cause zinc loss through selective evaporation from the molten zone. This loss may adversely affect both the mechanical properties and the corrosion resistance of the welded joint.
- In most cases, a stress-relief heat treatment may be required to prevent potential geometric distortion after welding.

Polishing **Mechanical polishing:** good
Electropolishing: good

Colour Silver-grey

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Corrosion resistance

Environment	Medium	Resistance
Rural atmosphere	non-oxidising acids	resistant *
Industrial atmosphere	Dry gases O_2, Cl, chlorinated water	resistant *
Marine atmosphere	water	resistant *
Humidity	perspiration	not resistant *
High concentration of halogen gases	cyanides	not resistant *
Hydrogen sulphide atmosphere	sulphides, halides	not resistant *
Ammoniacal atmosphere	oxidising acids	not resistant *

* May form an adherent protective layer on the exposed surface(s).

Physical properties

Properties	*Unit*	*Temperature (°C)*			
		20	100	200	300
Density	g cm^{-3}	8.8			
Elastic Young modulus E	GPa	165			
- Cold Worked		170			
- Annealed			110	94	
Electrical resistance	µΩ cm	38			
Specific Electrical Conductivity	% IACS	4.5			
Coefficient of Thermal Expansion	10^{-6}/C		20 – 100°C	20 – 200°C	20 – 300°C 16
Thermal Conductivity	W m^{-1} K^{-1}	22		25	
Melting Range	solide	1'150			
Magnetic Susceptibility		1.0004			
Magnetism	Non-ferromagnetic				

Disclaimer: The information and data contained in this technical data sheet are provided for guidance only. They do not constitute operating instructions. Such instructions must be established by the user for each specific application of the material.

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