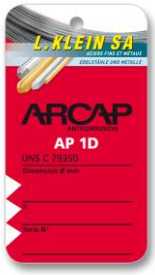

ARCAP AP1D

CuNi25Zn12 – Free machining nickel silver alloy alloyed with Pb

Features and Particularities

Die ARCAP AP1D alloy is an improved corrosion resistant free machining nickel silver alloy. It is alloyed with Pb to obtain a still better machining and longer tool life. High machining speeds up to 150 m/min are achievable according to the used machine tool and tooling. Very smooth surfaces can be achieved at high cutting speeds with diamond cutting tools. This nickel silver alloy permits to obviate and suppress the formation of drilling burrs.

Uses

The ARCAP AP1D nickel silver alloy is used for fittings, spectacle frames, wear parts and numerous parts produced by turning.

Standards

Material number	ARCAP AP1D
EN	CuNi25Zn15Pb1
UNS	C79350

Chemical composition (%wt)

Cu	Ni	Mn	Pb	Sn	Fe	Zn
59.0	23.0	max.	0.80	max.	max.	balance
63.0	26.0	0.50	1.10	0.60	0.25	

Dimensions and executions Delivery condition

- Bars: round, square or hexagonal
  - Ø < 24.0: 3 m, length -0/+50 mm
  - Ø 25.0-29.0: 2.5 m
  - Ø 30.0-32.0: 2.0 m
  - Ø 33.0-38.0: 1.5 m
  - pointed and chamfered
- Wires Ø up to 2.5 mm: rings for Escomatic
- Strips: straightened or rolled rings

Mechanical properties

Bars and Wires:

Condition: cold drawn	Hv	Rm (MPa)	A_{100} (%)
Ø <2.5 mm		550-650	≥2
2.5 ≤ Ø < 5 mm	4/4 hard	600-750	≥2
5 ≤ Ø < 12 mm		550-650	≥2
Ø > 12 mm	Hardness check only		
12 ≤ Ø 35 mm	hard ≥ 160		
Ø > 35 mm	on request		

Availability

Standard dimensions on stock, see: Delivery program

Machining

- The ARCAP AP1D nickel silver alloy is generally machined in the cold deformed (drawn or rolled) condition.
  - Machinability: good
  - Cutting speed: up to 150 m/min
  - Lubricant-coolant: individual choice
- The optimal cutting conditions depend on the machine tool, the cutting tools, the chip dimensions, the lubricant-cooling fluid, as well as the tolerances and surface the roughness to be achieved.

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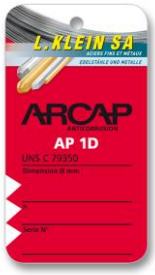

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CuNi25Zn12 – Free machining nickel silver alloy alloyed with Pb

Annealing	Soft anneal:	600-650°C/15-60 min under protective atmosphere
	Stress relieving:	max. 300°C / m/m 1h
Hardening	ARCAP AP1D nickel silver cannot be hardened by heat treatment	
Strengthening	ARCAP AP1D nickel silver can be strengthened a by cold working and forming	
Microstructure	Die microstructure of ARCAP AP1D stay single phase in all deformation operations.	
Laser marking	Laser marking	suitable
	• Laser heating and overheating can cause an unintended dezincification of the laser marking dots with modification of the microstructure, mechanical properties and corrosion resistance.	
Brazing	Brazing:	very well suited
	Soldering:	very well suited
Soldering	Generally good suited	
Gluing	Gas:	average
	Arc:	average
Welding	Laser:	very good
	Electron beam:	very good
	WIG:	very good
	MIG:	satisfactory
	Resistance:	good
	• The heat developed during welding can lead to a Zink-loss by evaporation of the molten welding joints. This los scan negatively influence the mechanical properties as well as the corrosion resistance.	
	• A stress relieve treatment is necessary in most of the cases to prevent welding geometric distortions after welding.	
Polishing	The ARCAP APID nickel silver alloy is well amenable for polishing	
	• mechanical:	suitable
	• electrolytic:	suitable
Color	The color oft he ARCAP AP1D nickel silver alloy is matt grey silver	

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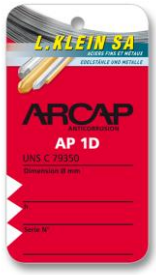

ARCAP AP1D

CuNi25Zn12 – Free machining nickel silver alloy alloyed with Pb

Corrosion resistance

Atmosphere	Resistance	Medium	Resistance
Countryside	resistant *	Non-oxidant acids	resistant *
Industrial atmosphere	resistant *	Dry gases O_2, Cl, Chlorinated water	resistant
Marine atmosphere	resistant *	Water	resistant
Humidity	resistant *	Body sudation	not resistant
High concentration of halogen gas	not resistant *	Cyanide	not resistant
Hydrogen sulfide respectively Sulfide	not resistant	Halogen	not resistant
Ammoniac	not resistant	Oxidant acids	not resistant
Stress corrosion		Ammoniac solutions	not resistant
cracking	Not susceptible		

* Can develop an adhering auto-protective layer

Physical Properties

Property	Unit	Temperature (°C)			
		20	100	200	300
Density	$g.cm^{-3}$	8.8			
Young modulus E	GPa	115			
- cold deformed		117			
- annealed			110	94	
Electrical resistance	$\Omega.mm^2.m^{-1}$	0.105	0.13		
Specific conductivity	% IACS	13		7.8	
Thermal expansion	$m.m^{-1}.K^{-1}$ 10^{-6}		20–100°C	20–200°C 17.2	20–300°C
Thermal conductivity	$W.m^{-1}.K^{-1}$	55			
Solidus	°C	960			
Magnetic susceptibility	$cm^3.g^{-1}$	$-0.11.10^{8}$-5.10^{7} According to Fe content (max.0.10%)			
Magnetism	not magnetic				

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Modifications will not be adjusted automatically.
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