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MIRALLOY®

FOR COSTUME JEWELLERY



Copper-Tin-(Zinc) Electrolytes as Nickel-Free Alternatives

MIRALLOY® has been offering alternative nickel-free plating for fashion jewellery since 1981. With MIRALLOY®, electrolytes are used to deposit copper-tin or copper-tin-(zinc) coatings in rack and barrel plating. Depending on the electrolyte used, white or yellow layers can be deposited.

MIRALLOY® coatings stand out due to their excellent distribution of metal and, depending on the bath type, high tarnish resistance, levelling, abrasion resistance and exceptional corrosion resistance. A further plating layer with gold, rhodium, palladium or other precious metals, as well as tarnish protection if required, can be added with the right pre-treatment to create optimal corrosion protection.

Alloy Components Example		
Coating	white	yellow
Copper	55 %	85 %
Tin	30 %	10 %
Zinc	15 %	5 %



Advantages

- Copper-tin-(zinc) alloy coatings of white or yellow colour
- Diamagnetic
- Nickel-free (§27 of REACH, Ann. XVII, Reg. (EC) No 1907/2006, Standard 100 by OEKO-Tex®)
- Resistant to tarnishing and corrosion
- Excellent layer thickness distribution
- Can be lacquered
- Can be combined with precious metals
- Tried and tested process does not cause allergic reactions in the way that nickel does

Applications

- Costume jewellery
- Ear studs / earrings
- Necklaces
- Bangles
- Wrist watches

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TECHNICAL SPECIFICATIONS MIRALLOY® 2847

Electrolyte characteristics	
Electrolyte type	Alkaline-cyanide
Metal content	10.5 g/l Cu 21.5 g/l Sn 1.6 g/l Zn
pH value	Alkaline
Operating temperature	60 °C
Current density range	0.5 A/dm ²
Plating speed	Approx. 0.12 µm/ min at 0.5 A/dm ²
Anode material	MMO (type PLATINODE® 167)

Coating characteristics	
Coating	Copper-tin-zinc
Alloy composition	85 wt. % Cu 10 wt. % Sn 5 wt. % Zn
Colour of deposit	2 N
Brightness	Bright
Hardness of deposit HV 0.015 (Vickers) approx. values	400 HV
Max. coating thickness	20 µm
Density of the coating	8.4 g/cm ³

MIRALLOY® Copper-Tin-(Zinc) Electrolytes for Costume Jewellery:

- MIRALLOY® 2840 (white) for rack operation
- MIRALLOY® 2841 (white) for rack and barrel operation
- MIRALLOY® 2844 (white) for barrel and rack operation
- MIRALLOY® 2847 (1N and 2N) for barrel and rack operation
- MIRALLOY® 2850 (white) for rack and barrel operation

European Nickel Regulation

In Europe 15 to 20 per cent of all women and about five percent of all men are allergic to nickel. For this reason, legislators issued the 7th change to the Consumer Goods Act; the European Nickel Act (§27, Ann. XVII, Reg. (EC) No 1907/2006): Earrings and comparable objects remaining in a wound during the healing process may not contain more than 0.5 % by weight of nickel.

Objects intended to come into direct and prolonged contact with the skin (e. g. earrings, necklaces, rings, watches, buttons etc.) were not permitted if the part of the product that would come into prolonged contact with the skin released more

than 0.5 µg/cm²/week of nickel.

When using nickel-free plating, it must be guaranteed that the part of the product that will be in direct and prolonged contact with the skin does not release more than 0.5 µg/cm²/week of nickel in two years under normal circumstances.

Definition of Prolonged Skin Contact (ECHA Q&A no935)

The ECHA (European Chemical Agency) developed a scientifically supported interpretation of 'prolonged skin contact':

Prolonged contact with the skin is defined as potential content between the skin and items containing nickel for more than

- 10 minutes for three or more occasions within two weeks, or
- 30 minutes for one or more occasions within two weeks.

Apart from costume jewellery, this regulation affects a number of consumer goods such as clothing accessories, craft tools, writing utensils, spectacle frames, work tools, buckles, handles and steering wheels, devices for body care, mouthpieces, kitchen appliances and electronic devices.

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