umicore
Electroplating

MIRALLOY®
Nickel free

Zn
Sn
Cu

No nickel allergies by copper-tin-(zinc) electrolytes

Your advantages:

+ Copper-tin-(zinc) alloy coatings of white or yellow colour
+ Nickel-free (EC Nickel Directive 94/27/EC, Oeko-Tex 100 ff)
+ Free of heavy metals such as Cr, Pb, Co, Th, etc.
+ Can be combined with precious metals
+ Diamagnetic
+ Resistant to tarnishing and corrosion
+ Excellent thickness distribution
+ Wide operating range
+ Can be lacquered
+ The coatings are RoHS compliant
+ No allergies as known of nickel

Nickel is the contact allergen number one. In Europe 15 to 20 per cent of all women and about five per cent of all men are sensitive to nickel. With women under 30 years, the degree of sensitization is even about 40 per cent. After sensitization and prolonged or repeated contact with the allergen, skin or mucous membranes react with inflammation (e.g. skin rashes). The skin zones which are particularly endangered are earlobes (ear studs, earrings), neck and arms (costume jewellery, watches) and hip area (metal zips and trouser buttons).

According to the latest scientific findings, MIRALLOY® coatings do not cause allergies as known of nickel, so they are just the right alternative. Combined with nickel-free substrate materials and further nickel-free processes, the MIRALLOY® process allows the manufacture of perfectly skin-compatible objects. Wear tests with sensitive test persons have proved the skin compatibility. MIRALLOY® is therefore successfully used for the nickel-free coating of objects all over the world.

Belt buckle coated with MIRALLOY®.

Applications

- Costume jewellery
  (ear studs, earrings, necklaces, bangles, etc.)
- Clothing accessories
  (zips, metal buttons, etc.)
- High frequency technology
  (precision components, guide bushes, hydraulic parts, screws)

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Technical specifications MIRALLOY® 2850

Electrolyte characteristics MIRALLOY® 2850

Electrolyte type	Alkaline-cyanide
Metal content	8.5 g/l Cu 34.0 g/l Sn 1.0 g/l Zn
pH value	> 13
Operating temperature	60 °C
Current density range	2.0 A/dm²
Plating speed	Approx. 0.28 µm/ min at 2.0 A/dm²
Anode material	MMO (type PLATINODE® 167, graphite)

Coating characteristics MIRALLOY® 2850

Coating	Copper-tin-zinc
Alloy composition	50 wt. % Cu 40 wt. % Sn 10 wt. % Zn
Colour of deposit	White
Brightness	Bright
Hardness of deposit HV 0.05 (Vickers) approx. values	600 HV
Max. coating thickness	10 µm
Density of the coating	8.2 g/cm³

MIRALLOY® copper-tin-(zinc) electrolytes for the clothing industry:

- MIRALLOY® 2841 (white) for rack and barrel operation
- MIRALLOY® 2844 (white) for barrel and rack operation
- MIRALLOY® 2844 LC (white) for barrel operation
- MIRALLOY® 2844 E (white) for barrel and rack operation
- MIRALLOY® 2850 (white) for rack and barrel operation
- MIRALLOY® 2851 (white) for rack operation
- MIRALLOY® 2852 (white) for barrel operation

Due to the sensitizations to nickel, the legislators translated the European Nickel Directive into national law (see below) with the 7th amendment of the Consumer Goods Ordinance (14 June 2000):

European Nickel Directive (Directive 94/27/EC, 30 June 1994)

- 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, chains, rings, watches, buttons etc.) must not be used if the rate of nickel release from those parts of these products coming into prolonged contact with the skin is greater than 0.5 µg/cm²/week.
- If a non-nickel coating is used, it must be guaranteed that the rate of nickel release from those parts coming into direct and prolonged contact with the skin will not exceed 0.5 µg/cm²/week for a period of two years of normal use of the product.

The world of noble and functional surfaces

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