ELECTROPLATING

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Electrolyte for Electroplating with Pure Platinum

Platuna PT enables the deposition of exceptionally thick, homogeneous and crack-free platinum layers, which are particularly convincing in various technical applications.

Umicore Metal Deposition Solutions has developed an electrolyte for electroplating with pure platinum: Platuna PT. The electrolyte enables the deposition of exceptionally thick, homogeneous and crack-free platinum layers, which are particularly convincing in various technical applications.

Photo Credit: Umicore

Platinum is a precious metal with outstanding properties such as high corrosion and abrasion resistance, excellent electrical conductivity, biocompatibility and catalytic activity. Platinum coatings can therefore improve the performance, durability, efficiency and effectiveness of technical applications or increase the sensitivity and accuracy of measurements. In addition, platinum is a recyclable metal that contributes to the circular economy.

The Platuna PT electrolyte is the result of many years of R&D at Umicore. The electrolyte is highly acidic and has a low sulfuric acid content, making it less aggressive toward the substrate to be coated. Furthermore, it has a deposition speed of approx. 0.13 microns per min. at 5 ampere/decimeter², independent of the current intensity. The very long shelf life compared to many conventional platinum electrolytes (no precipitation) and the ease of transportation and storage (no cooling required) enable large storage quantities and thus a forward-looking cost calculation.

Platuna PT consists of 99.9% pure platinum and proves its high coating quality through the following properties:

- crack-free layers up to 5 microns
- uniform layer thickness distribution with a density of 21.4 g/cm^3
- hardness of approx. 350 HV
- fog-free, without color cast, very bright (L* value: 87) and glossy
- high abrasion resistance

- excellent corrosion resistance
- very good tarnish resistance

These coatings are suitable for a range of technical applications, such as a catalyst in electrolyzers for hydrogen production: Platinum accelerates the hydrogen evolution reaction at the cathode and reduces the amount of energy required for the reaction. Platuna PT can be deposited directly onto the carrier material (ideally titanium or nickel) and produces a thin and homogeneous platinum layer.

Platinum is also ideally suited as a surface material in medical sensors, as it is biocompatible, corrosion-resistant and electrically conductive. Platuna PT coatings are therefore used on electrodes, catalysts or receptors in various sensors such as ECG, glucose, oxygen or pH sensors. Electrical contact surfaces, for example in connectors, also benefit from this. The platinum layer reduces the contact resistance between the contacts and increases corrosion and abrasion resistance.

Platuna PT can thus improve the performance and service life of electronic, industrial and automotive plug contacts. In addition, platinum coatings are used in a variety of other technical applications or industries - water treatment or process control are just a few examples.

In some technical applications, even very thin layers can be sufficient. This is why Umicore offers its customers interested in the product comprehensive advice and, if required, on-site technical service. In this way, the company can contribute to significant cost optimization on the basis of empirical values and the analysis of possible test layers.

This also applies to applications such as jewelry, watches, writing implements, spectacle frames and fittings, as the electrolyte is also suitable for decorative coatings.