

# IST International Surface Technology

The International Edition of **JOT**  
Germany's Leading Magazine for Surface Technology

## Functional Coatings

Plasma Technology as an Alternative To Electroplating?

## Pretreatment

Unclear Salt Limits Make Corrosion Protection More Difficult

## Polyaspartic Resins

The Curing Oven Remains Switched Off

Focus Topic

## Requirements for Perfect Parts Cleaning





# Platinum Layers for Applications from Hydrogen to Connectors

A special electrolyte for electroplating with pure platinum opens new possibilities. According to the supplier, it allows the deposition of exceptionally thick, homogeneous and crack-free platinum layers, which should open advantages in various technical applications in particular.

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 highly recyclable metal that contributes to the circular economy.

## Interesting profile of properties

The Platuna PT electrolyte is the result of many years of research and development at Umicore. The electrolyte is highly acidic and has a low sulphuric acid content, making it less aggressive towards the substrate to be coated. It also has a deposition speed of approx. 0.13  $\mu\text{m}/\text{min}$  at 5 A/dm<sup>2</sup>, regardless of the current intensity. According to the supplier, the very long shelf life (no precipitation) compared to many conventional platinum electrolytes and the ease of transportation and storage (no cooling required) enable large storage quantities and therefore forward-looking cost calculation. According to Umicore, Platuna PT consists of 99.9 % pure platinum and demonstrates its high layer quality through the following properties:

- crack-free layers up to 5  $\mu\text{m}$
- very uniform layer thickness distribution with a density of 21.4 g/cm<sup>3</sup>



The new electrolyte was developed to accelerate the hydrogen evolution reaction at the cathode in electrolyzers for hydrogen production.



The platinum coating can improve the performance and service life of electronic, industrial and automotive plug contacts.

- hardness of approx. 350HV
- absolutely haze-free, without color cast, very bright (L\* value: 87) and glossy
- high abrasion resistance
- excellent corrosion resistance
- very good tarnish resistance

## Wide range of applications

Platuna PT coatings are suitable for a wide range of technical applications. One example is its use 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 enables a very 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 layers 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. The electrolyte can therefore 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. Here too, Platuna PT can improve performance, durability, efficiency and effectiveness or increase the sensitivity and accuracy of measurements, according to the supplier. The platinum electrolyte is also suitable for decorative coatings on jewelry, watches, writing instruments, glasses and fittings.

## Comprehensive consulting for best possible use

In some technical applications, even very thin layers can be sufficient. This is why

Umicore offers those interested in Platuna PT comprehensive advice and, if required, on-site technical service. In this way, the company can contribute to significant cost optimization based on empirical values and the analysis of possible test layers. //

## Contact

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## Extended lifespan for electroplating basins

### CORROSION PROTECTION

Sealed surfaces protect the concrete basins from aggressive media

### LONG-TERM MEDIA RESISTANCE

No corrosion of PP liners inside electroplating basins for 25 years

### HIGH OPERATING RELIABILITY

Best weldability of liners and pipes ensures maximum leak-tightness

### TIME-SAVING INSTALLATION

Pre-assembled concrete protective liners reduce on-site installation time

