

Issue 28/2005

# GOLD POST

For friends and  
employees of  
Umicore  
Galvanotechnik

**RHODUNA® - new brand  
for all rhodium plating  
electrolytes**

**New:  
Palladium-Nickel 463  
Palladium 457 and  
RHODUNA® 272**

**Application technology  
in new laboratories**

**Company profile  
Montblanc, Hamburg**

**CHEMET - Umicore  
representative in India**

Dear Ladies and Gentlemen,

welcome to the new edition of our Gold-post magazine. There are a lot of exiting news, and I am pleased to use the opportunity to inform you about our business development. Firstly, in the name of the whole team I like to thank all our business partners for the well recieved confidence and co-operation. We could end the last fiscal year very successfully with a remarkable growth in sales. In accordance with our motto "materials for a better life" we could launch new products to the market which will provide even better features.





Despite the difficult economic condition of the European and North American markets we were able to gain further market shares by continuously improving our product and service quality.

In Asia, our continued economic success can be attributed to our long-term presence in all the main markets in the region. Our extensive service network also ensures that especially our international customers can rely on excellent local service for our high quality products at virtually all of their production locations.

By working closely together with strategic partners we have also expanded our product portfolio. This will enable further growth in selected new applications fields. Of course, the area of precious metal electroplating remains the basis of our business. As a part of the Umicore Group we have all necessary tools and resources available to us to successfully support our customers as a reliable and trustworthy precious metal partner.

We are pursuing continued improvements and expansion in our research, production and service location in Schwaebisch Gmuend. At the same high level of commitment we are investing in new products and future business applications. The integration of formerly outsourced research activities, the commissioning of new laboratories, the set-up of a new production and logistics centre and the hiring of several highly trained new colleagues are a good reason for you to experience yourself the company's performance.

I look forward to welcome you personally at our location and wish you all the best from Schwaebisch Gmuend.

Yours sincerely,  
Thomas Engert

Managing Director  
Umicore Galvanotechnik GmbH  
Schwaebisch Gmuend

To the cover picture:  
The Montblanc Limited Writers Edition 2004 Jules Verne was honoured as the best Limited Edition of 2004 by the US magazine Pen World International. Electroplated coatings: nickel, Palladium-Nickel 462 and platinum (PLATUNA® N1). In the background you can see the administrative building of Montblanc in Hamburg.

## Trade fair review

**Umicore Galvanotechnik was represented at many international trade fairs in 2004 and 2005; generally together with the corresponding foreign representatives.**

**AESF-Surfin, St. Louis, USA:**  
13 - 16 June 2005

**KPCA-Show in Seoul/Korea:**  
19 - 21 April 2005

**Hanover Fair – the world's largest trade fair for surface technology:** 11 - 15 April 2005

**Trattamenti & Finiture in Parma:**  
31 March - 2 April 2005

**Istanbul Jewellery Show:**  
24 - 27 March 2005

**CPCA Show, Shanghai**  
for the printed circuit board industry:  
16 - 18 March 2005

**International Jewellery Dubai:**  
6 - 10 December 2004

The international **SF China 2004** fair was held in November 2004 in Guangzhou. The main focus was on MIRALLOY® for technical and decorative applications. Umicore Galvanotechnik also presented its extensive PLATINODE® (Pt/Ti and MMO anodes) product range. More than 200 Umicore visitors are witness to the outstanding success of the trade fair.



SF China 2004

Umicore Galvanotechnik participated in the **TCPA Show** in November 2004 together with our Taiwanese partner, Ages Co. Ltd., **Taipei**. We would particularly like to mention the large numbers of visitors during the fair. There was a lot of interest in the chemical nickel/immersion gold process (NIRUNA®). This is complemented by the optional electroless gold plating bath AURUNA® 516. This provides our customers with advanced processes for the printed circuit board production.



Trade fair in Dubai 2004



Hanover Fair 2005



Trade fair in Parma 2005



Nariman H. Wadia from the Indian representation gave the welcoming speech for the Indian Jewellery Fair.

During the **Indian Jewellery Fair** in Mumbai in July 2004, Umicore staff (Mr Kirschbaum and Mr Seber) held expert speeches on the topics of rhodium and colour gold plating electrolytes combined with practical presentations. The event was organised and sponsored by the Indian representation, Nariman H. Wadia Jewellery Techniques, Mumbai.

## Trade fair preview 2005

**Stamping-Days Pforzheim:**  
21 - 23 September 2005

**TPCA-Show, Taipei:**  
5 - 7 October 2005

**SF China 2005, Shanghai – Trade fair for surface technology:**  
16 - 18 November 2005

**Productronica in Munich,**  
15<sup>th</sup> international trade fair for the electronics industry:  
15 - 18 November 2005

## Palladium-Nickel 463

Depending on the layer thickness requirements, this new palladium-nickel electrolyte can be used with less metal content.

Shiny electroplated coatings (80 per cent palladium and 20 per cent nickel) are deposited from the robust electrolytes across a broad current density working range and also after a long service life. This means that it is also ideally suited for toll plating companies. The layers are white, very hard, very resistant to abrasion and corrosion and are thus used for both technical and decorative applications.

## Palladium 457

**A new electrolyte for ductile, pure palladium coatings.**

The electrolytic process is characterised by the fact that even thick layers (5 µm) can be deposited without cracks. Layers of 3 µm can be bent around a 20 mm mandrel without cracking. The coatings also have a low contact resistance and are resistant to abrasion and corrosion. Palladium 457 is used at a higher temperature, has a broad working range and contains no volatile additives. It requires very little maintenance and can be used for both rack and barrel applications.



Palladium 457 fits seamlessly into the colour range of white to black sample rings: from left to right RHODUNA® TD, ARGUNA® 621, Palladium 457, Platinum K, Ruthenium 478, Black Ruthenium 477 and RHODUNA® 470 black.

## RHODUNA® 272

**Latest generation Rhodium pen-plating electrolyte with very high plating speed.**

Extremely bright and brilliant white coatings with very high deposition speeds can be easily achieved. The deposition creates no dark stripes on the edges – with very good activation of the base material. Typical areas of application are spectacle frames, carat and costume jewellery, tableware and technical products.

## TRIALLOY®

**TRIALLOY® 825 and 828 are alkaline electrolytes for depositing an alloy of tin, zinc and cobalt.**

A layer composition of approx. 32 % tin, 60 % zinc and 8 % cobalt can be achieved with TRIALLOY® 825 in barrel or rack operation. The layers are mainly used in the functional area as corrosion protection for iron materials. No subsequent treatment (such as passivating) is necessary but can be carried out if required.

TRIALLOY® 828 is a rack electrolyte for depositing an alloy of approx. 50 % tin, 40 % zinc and 10 % cobalt. The colour of the layer is approximately the same as chromium but it might darken subsequently. TRIALLOY® 828 is mainly used in decorative applications, for example, on a bright nickel layer.

	TRIALLOY® 825	TRIALLOY® 828
Metal content of the electrolytes	20 g/l Sn, 11.5 g/l Zn, 1.5 g/l Co	32 g/l Sn, 2.4 g/l Zn, 2 g/l Co
pH	11.15	10.6
Temperature	60 °C	60 °C
Current density, rack	1.0 - 1.5 A/dm <sup>2</sup>	1.0 A/dm <sup>2</sup>
Current density, barrel	0.5 - 1.0 A/dm <sup>2</sup>	-
Speed at 1.0 A/dm <sup>2</sup>	0.18 µm/min	0.12 µm/min
Alloy composition	32 % Sn, 60 % Zn, 8 % Co	50 % Sn, 40 % Zn, 10 % Co
Layer thickness	typical 5 - 10 µm, maximum 20 µm	typical 0.5 - 2 µm, maximum 5 µm

### Colour comparison of various white layers

	L-value (brightness)	a-value (red +, green -)	b-value (yellow +, blue -)
SnZnCo (TRIALLOY® 828)	84	-0.8	2.6
Chromium	84	-1.5	2.8
Nickel	82.8	0.5	6.9
CuSnZn (MIRALLOY® 2844)	86	0.2	3.4
Palladium (Pd 459)	81	0.8	6.8



# NIMUDEN KTY

Organic stabilised electroless nickel electrolyte



Electronic components - coated with NIMUDEN KTY.

NIMUDEN KTY is the latest generation electroless nickel plating bath from Uyemura/Japan, for which Umicore Galvanotechnik GmbH has the exclusive distribution rights since 2004.

NIMUDEN KTY is a very good alternative to conventional electroless nickel electrolytes which contain heavy metals. The fully metal-free stabiliser system will fulfil the EU standards on lead-free surfaces (WEEE, RoHS, ELV) that take effect on 1 July 2006. Since it was launched on the market for coating iron, steel, brass and aluminium, the electrolyte is well accepted because of its very good bath stability it can also be used in automatic plating lines.

NIMUDEN KTY deposits coatings with a phosphorus content of 10.5 - 11.5 %. It has an evenly high deposition rate of around 15 µm/h up to a bath age of 6 MTO. Independent of the two replenisher solutions that are available, customers can choose to keep the pH constant with caustic soda or with an ammonia solution. Because of the constant phosphorus content throughout the bath life and the low internal stresses as well as the excellent mechanical properties the brightness-retaining coatings also have a pleasant appearance.

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# RHODUNA® – a new trademark

The same product - a new name  
 "Degussa Rhodium" is now Umicore  
 RHODUNA®

Umicore Galvanotechnik is regarded as the leading producer of rhodium electrolytes throughout the world. The former name "Degussa Rhodium", which was known and positively anchored in the market, can no longer be used due to the takeover of OMG in 2001 and then by Umicore in 2003. Therefore a new name was launched as a registered trademark: RHODUNA®.



RHODUNA® sales display

The new brand stands for the excellent quality of all rhodium plating baths at Umicore Galvanotechnik. RHODUNA® is synonymous with very high quality rhodium electrolytes. At the same time the packaging of the rhodium components was changed. In future you will still receive the products in the same bottles but with a new lid in the exclusive green "Umicore colour". The bottles are also sealed with shrink film. The new packaging protects the products against imitations and gives you the certainty that you are getting the original high quality products from Umicore that you know and trust.

The new RHODUNA® bottles compared to the old packaging units.



# RoHS and WEEE

Two European Community Directives

Two EC Directives that have an effect on the electronics and electronics components industries have been in place since February 2003.

These are the following regulations:

- EC Directive 2002/96/EC

Disposal of electrical and electronic waste.

WEEE Directive = Waste from Electrical and Electronic Equipment.

- EC Directive 2002/95/EC

Restriction of use of certain hazardous substances in electrical and electronic equipment.

RoHS Directive = Restriction of Use of certain Hazardous Substances in Electrical and Electronic Equipment.

The main aims of these two EC Directives are to avoid waste from electrical and electronic equipment, to reduce the amount of waste through reuse, to specify collection, recovery and recycling quotas and to reduce the amount of pollutants of electronic equipment.

Banning the use of certain hazardous substances in the production of new devices will prevent negative impacts on the environment and health right from the beginning. The obligations to take responsibility for disposal, i.e. for handling, recovery and removal of the equipment, will force manufacturers to integrate the entire life cycle of their products into their costing.

The RoHS Directive envisages a ban on the sale of certain hazardous substances with the exception of specific applications, which are detailed in the appendix to the directive. With the current level of technology, these substances are found in many components and in future the device manufacturers will be obliged to guarantee that they are free of contaminants.

The reasons for this are the health risks and the burdens on ground water, soil and the air caused by the disposal of electronic waste and the increase in the amount of electronic waste in landfill sites.

The new bans on usage affect the heavy metals lead, cadmium and hexavalent chromium as well as mercury and certain bromine compounds (polybrominated biphenyl and polybrominated diphenyl ether). The bans apply from 1 July 2006.

Lead (Pb)	= 0.1 % (weight)
Mercury (Hg)	= 0.1 % (weight)
Cadmium (Cd)	= 0.01 % (weight)
Chromium VI (Cr VI)	= 0.1 % (weight)
PBB, PBDE	= 0.1 % (weight)

The two European Directives were implemented into German law on 16 March 2005 with the passing of the Electrical and Electronic Equipment Act (ElektroG = "Elektro- und Elektronikgerätegesetz").



# Montblanc – pure luxury from Hamburg

Montblanc, the international luxury brand with the white star, has been one of Umicore Galvanotechnik's most discerning customers for the last seven years – and there is a good reason for this. The manufacturer of high-quality writing utensils, watches, leather goods, jewellery, accessories, eyewear and fragrance is synonymous with absolute top quality and outstanding craftsmanship. And Montblanc also demands the highest quality from its suppliers.



Montblanc in Hamburg: the administrative building with stylised fountain pen cap as a stairwell.

## The culture brand with the star

The Montblanc company complex alone is a wonderful sight to look at. The architects have designed the stylised fountain pen cap, crowned with the Montblanc white star – which can be seen well beyond Hamburg's rooftops – as the stairwell of the administrative building. But apart from that, the star – the symbol for the highest snow-covered peak in Europe, Mont Blanc, and also a symbol of outstanding product quality – is present everywhere in the luxury goods manufacturing complex, even as a picture motif. Put on canvas and paper by selected, talented young artists from all over the world. Their works are present in offices, in corridors and in production areas. This constantly growing Montblanc Cutting Edge Art Collection is a mosaic in the multi-faceted cultural commitment which Montblanc and its employees are dedicated to in their corporate philosophy – to take time for the essentials.



Statesmen all over the world have signed historic treaties with the legendary Montblanc Meisterstück 149 fountain pen. They and other celebrities have made the fountain pen a cult object which the New York Museum of Modern Art now exhibits as a design icon. Around 100 work steps are required for the handmade 18 carat gold nib on which the figure 4810 – for the height of Mont Blanc – is engraved. Nickel plated metal parts such as the clip and rings are pre gold-plated with electrolytes from Umicore (AURUNA® 311) and are then coated with 3N and 2N (AURUNA® 231) gold layers.

## Time is the greatest luxury

Culture, savoir-vivre and time for the essentials also unite all Montblanc products in the corporate philosophy. With their timeless aesthetic values and their perfection which has been created with an enormous amount of passion and devotion they possess a completely intrinsic value: a soul. Lutz Bethge, Managing Director of Montblanc International, explains this as follows, "In a world that is becoming more and more soul-less as a result of modern technology, in a time of rapid acceleration, everyone needs things that allow them to pause for thought. Things that remind them of the true value of life. Stability, timelessness and tradition, for example. Values that find a new meaning in our time of constant change. To take time – time for thoughts and feelings, for beauty and culture. Time for yourself and for others, time for the essentials. To have time is the greatest luxury of our age."



Lutz Bethge, Managing Director of Montblanc International

## Throughout the world for 100 years

In 1906 a stationer and a banker in Hamburg teamed up with an engineer from Berlin to produce luxurious fountain pens manually. Until 1989 the production facilities were located in Montblanc House in the Schanzen district of Hamburg, where the legendary Montblanc Meisterstück was also created in 1924.

Today the company resides in its headquarters in Hamburg-Eidelstedt and like Cartier, for example, it is one of the international leading luxury brands united under the Swiss Richemont Holding. Of around 2,000 employed throughout the world approximately 700 work in the Montblanc headquarters in Hamburg, where the writing instruments are created. Watches are manufactured by Montblanc Montre SA in Le Locle/Switzerland and leather goods by Montblanc Leather GmbH in Offenbach. The 18th Montblanc sales subsidiary is currently being established - in China. And with two new Montblanc boutiques in Columbia, the company is now represented 252 times in more than 70 countries with its own point of sales.

The Montblanc La Bohème Line is an expression of the lifestyles of present day masters in the art of living. The Montblanc Bohème Jewels Topaz is especially difficult to coat with its large glossy metal surfaces – with nickel, Palladium-Nickel 462 and platinum (PLATUNA® N1). A new item of jewellery on the market: the Montblanc Bohème Lacquer Pearl, nickel-plated, pre-gold plated (AURUNA® 311) and then coated with 3N and 2N (AURUNA® 231).

90 per cent of the products are sold abroad. Customers and collectors await new collections and new limited writing instrument editions every year with great expectation. Currently the Montblanc designers in their exclusive idea workshops are working on additional new collections aimed at women and, of course, special collections for the company's upcoming 100-year jubilee in 2006.



Department head Thomas Langer (2nd from left) with some members of his plating team in front of the automatic rack plating line: (left to right) Günter Möller, Michael Brucki, Brigitte Schmidt, Monika Lemke, Ingolf Voss, Hannelore Eichert, Frauke Elmers and Carmen Feil.



Automatic barrel plating line in the Montblanc plating shop



Automatic rack plating line in the Montblanc plating shop

## The quality benchmark is high

Thomas Langer heads the very modern plating department with 15 staff at Montblanc in Hamburg. As in all the other departments the benchmark for quality is very high. Automatic barrel and rack plating facilities controlled with the help of the latest computer technology are the heart of the department. The focus is on having the best possible, resource-conserving plating process available which, for example, operates with a closed water circulation system and a system for recovering all metals from the production process. The demand for quality in the products is uncompromisingly high. Flawless, durable surfaces with a perfect gloss and absolute colour matching – self-evident for a luxurious writing utensil that may well end up as an heirloom.

## Umicore Galvanotechnik fulfills highest requirements

For about seven years, Umicore Galvanotechnik has also been helping to implement Montblanc's high claims of quality. "We came together," remembers Mr. Langer, "as a result of the palladium-nickel plating process which was difficult for Montblanc to install. Specific chemical requirements had to be fulfilled so that the coated parts could withstand the further mechanical processing in surface technology. While other suppliers had long given up in view of our high demands, Umicore successfully faced the time-consuming task." All the metal parts of the writing utensils such as tips, clips, rings, barrels, caps and cases have to be coated. And of course the core of the fountain pen – the nib. Montblanc uses the Umicore electrolytes platinum PLATUNA® N 1, Palladium-Nickel 462, Palladium-

Nickel 4620 as a barrel version, gold AURUNA® 311, gold AURUNA® 231, gold AURUNA® 547 and rhodium RHODUNA® TD. Typical layer sequences: nickel/palladium-nickel/platinum. Or nickel/pregold/gold colour 3N/gold colour 2N. The Montblanc electroplaters are especially concerned with obtaining a perfect gloss, optimum adhesion, corrosion resistance, low wear and good reproducibility. "The Umicore electrolytes fulfil our highest demands for the decorative and functional properties of the coatings and also guarantee the high degree of reproducibility of the layers," says Thomas Langer.

For about five years the trend has been towards bright surfaces and, since then, platinum (PLATUNA® N1) has been used at Montblanc. "Bright and hard," praises Mr. Langer. But the company is already looking at a new coating. A gold tone which has to be especially bright and very glossy. Thomas Langer is confident. "Together with my 'virtual namesake', Umicore representative Torsten Lange, we have resolved every problem that we had in the past – even on weekends."



The new Montblanc Boutique on the noble Neuer Wall in Hamburg. All boutiques throughout the world have the same typical Montblanc design.



Valuable collectors' object: the Montblanc Limited Edition Patrons of Art 2005 Pope Julius II. In the plating shop the metal parts were nickel plated, pre gold-plated (AURUNA® 311) and then coated with 3N and 2N (AURUNA® 231).

# Black mixed metal oxide anodes (MMO anodes)

Umicore Galvanotechnik has been involved in the production of insoluble anodes for more than 30 years.

In the 1960s, Degussa developed the High Temperature Electrolysis (HTE) process for the manufacture of platinized titanium/niobium anodes (so-called insoluble anodes). In this process, the platinum layer is deposited from a molten cyanide salt. These anodes have proven their quality in many different applications, especially for chromium plating from sulphuric acid Cr-(VI)-electrolytes.

In certain applications the cost/benefit ratio and the effectiveness and lifetime of platinized titanium or niobium anodes is not optimal. In these cases, anodes coated with precious metal oxides are a good alternative. As these oxides have a black colour, we also talk about "black anodes".

## The black layer theory

Precious metal oxides are metallic oxides from the platinum group metals iridium and ruthenium, which are generally mixed with non precious metal oxides such as tantalum or titanium oxide. As opposed to platinized titanium, the coated layers are not defined by the layer thickness ( $\mu\text{m}$ ) but instead by the layer weight ( $\text{g}/\text{m}^2$ ) and the mixing ratio of the metallic oxides. Therefore, anodes with mixed metallic oxide coatings are also called **Mixed Metal Oxide anodes (MMO anodes)**.

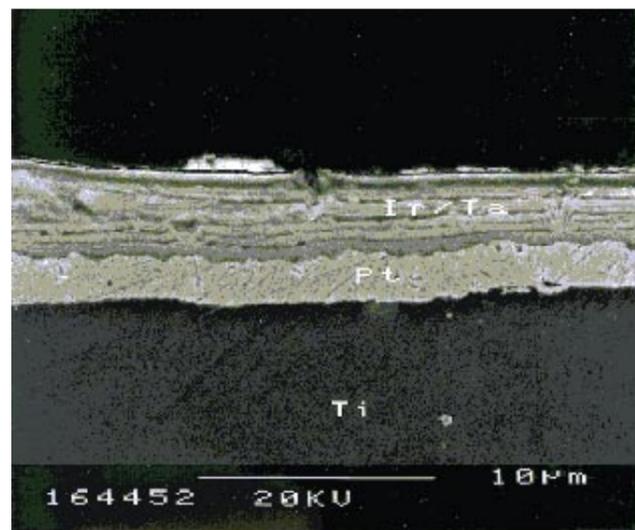
Adhesion of the MMO layers is achieved especially by roughening the surface of the base material and is therefore more of a mechanical nature. Electrochemically deposited platinum, on the other hand, adheres mainly due to physical and chemical bonding forces between the layer and the base material. The MMO layers are applied by rolling or spraying on dissolved chloridic iridium or ruthenium compounds. When the layer has been applied, it is pre-dried and then completely converted into its oxidic form in a temperature-time controlled conversion process. This application process creates a laminar, multi-layer structure.

For the life of the anode it is especially important, that as little as possible residue of the chloride containing precious metal compound remains, as otherwise this could have a negative effect on the corrosion resistance of the layer system. At Umicore Galvanotechnik our intensive quality control ensures that this is the case.

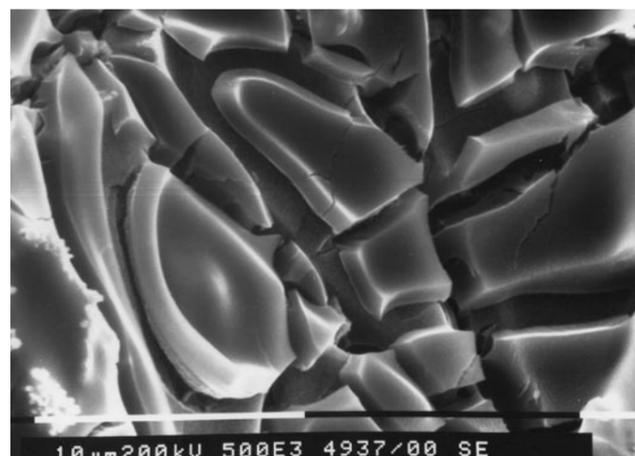


Black mixed metal oxide anode

## Layer structure



REM image through a cross section; layer structure: HTE platinum with iridium-tantalum oxide top coating



REM image of a MMO layer

## Precious metal deposit weights of MMO layers

While the platinum layer is given in  $\mu\text{m}$  for platinized titanium, for MMO layers the layer weight is usually given in  $\text{g}/\text{m}^2$ . Generally the layer weight is given in relation to the precious metal content. Typical MMO layer weights are between  $12.5 - 25 \text{ g}/\text{m}^2$  precious metal coating. For instance, if we consider the specific density of ruthenium ( $12.2 \text{ g}/\text{cm}^3$ ),  $12.5 \text{ g}/\text{m}^2$  only represents an approx.  $1.0 \mu\text{m}$  deposit of precious metal. In the case of iridium (density =  $22.5 \text{ g}/\text{cm}^3$ ),  $12.5 \text{ g}/\text{m}^2$  only represents an approx.  $0.5 \mu\text{m}$  deposit of precious metal. On the other hand, with platinized titanium, with its usual layer thickness of  $2.5 \mu\text{m}$ , we have a deposit weight of  $53.75 \text{ g}$  platinum per  $\text{m}^2$ . This comparison makes it obvious that MMO anodes work with relatively little precious metal deposits. Therefore, MMO anodes are less costly in a direct price comparison with PtTi anodes (assuming the same geometry).

## Precious metal price situation

The following table gives an overview of current precious metal prices:

	Ru	Pd	Ir	Pt
Spec. density ( $\text{g}/\text{cm}^3$ )	12.20	12.00	22.50	21.45
Price ( $\text{€}/\text{g}$ )	2.30	5.40	5.70	25.00
Deposit of $20 \text{ g}/\text{m}^2$ ( $\text{€}$ )	46.00	108.00	114.00	500.00

Table: figures of June 2005

## Applications

Technically interesting in comparison to other anode materials are the low anodic oxygen and chlorine overpotentials of certain MMO mixtures. Therefore, in strong sulphuric acid copper electrolytes, MMO anodes are used very successfully in the field of copper plating of printed circuit boards.

MMO anodes are also suitable for precious metal deposits. For example, because of their favourable behaviour in regard to organic bath additives, they have been very successfully used in ammoniac palladium and palladium/nickel baths. Traditionally, MMO layers have been used in drinking water and swimming pool water treatment. The wastewater industry is divided regarding the use of black anodes. Anode materials like platinized titanium or lead are used for cyanide oxidation, while MMO anodes are used preferably for electrolytic metal recovery.

On the other hand, MMO anodes are not suitable in the hard chromium plating industry or in depositing chromium from Cr-(VI)-containing electrolytes as there is rapid  $\text{Cr}^{3+}$  enrichment in the electrolytes. In this area of application, lead anodes, platinized niobium and titanium anodes have been used for many decades. In this case the high oxygen overpotential of these anode materials helps prevent the unwanted increase of  $\text{Cr}^{3+}$  in the bath by reoxidising the trivalent chromium into its hexavalent form.

## Important selection criteria are:

- Price
- Lifetime under specific conditions
- Availability
- Current efficiency
- Oxygen and/or chlorine overvoltage
- Critical current density for chlorine generation
- Anodic decomposition of organic bath additives (brighteners, stabilisers, complexing agents, surfactants, etc.)

## Summary

These days a large number of different anode materials are available in the electroplating industry. Each anode material has its own, specific electro-catalytic properties which have to be coordinated to suit the respective application. The task of the electroplater is to choose and use the best anode for the required application. Umicore Galvanotechnik GmbH offers comprehensive advice and assistance in this area.

# Umicore Galvanotechnik in new application technology laboratories

After more than 20 years the application technology department has moved within the plant.

In 2003 Umicore Galvanotechnik equipped a separate building with modern laboratories for the entire application technology and research departments. The relocation took place in 2004 within a very short time, so that the laboratory's routine operations were not interrupted.



All laboratory activities are concentrated in an area covering more than  $500 \text{ m}^2$ : the application technology departments for precious metals and non-precious metals and the printed circuit chemistry department. We also took this opportunity of "bringing home" the research department - which had been located in the Umicore Plant in Hanau (formerly Degussa) since 1973 - to the operative business unit in Schwabisch Gmuend. This is a real gain as it further improved communication between the applied technicians, researchers and sales staff.

The open plan laboratory, which deliberately avoids separation between the departments, has created a spacious working atmosphere which also encourages an exchange of ideas and experiences.



New application technology laboratory including Research & Development.



**Your Gold connection:**  
+49 (0) 71 71 / 6 07 - 2 99

Simone Zaremba will provide you with the current Umicore daily prices for precious metals.

e-mail:  
simone.zaremba@eu.umicore.com

## Employees retiring from Umicore Galvanotechnik

Three Umicore employees – with a total of 104 years electroplating experience between them – are retiring.

There was a certain amount of sadness as the management and staff of Umicore Galvanotechnik GmbH bid farewell to Wilhelm Aichinger (42 service years), Dietmar Holdt (31 service years) and Klaus Schettler (32 service years) who are now starting their well-earned retirement. All three retirees have made a great contribution to the company's success.

**Wilhelm Aichinger** joined the company in 1962 as a qualified chemical technician. Initially he was responsible for the chemical laboratory for the analytical monitoring of precious metal alloys, incoming goods control of raw materials, scrap and sweeping analyses and for monitoring the electroplating baths. In 1963 he commissioned and looked after the first ion exchanger circulating water system with connected batch disposal. His great interest in electroplating technology led him to develop several precious metal baths – in some cases together with other colleagues – which patents were applied for. With the formation of the electroplating technology business unit in Schwaebisch Gmuend in 1972, Wilhelm Aichinger was given the task of developing the molten platinum salt bath and electrolyte production. In 1978 he was appointed environmental protection officer and became manager of bath production in 1980.

In the past years he very successfully developed new production plants for the manufacturing of gold salts and rhodium baths. In July 2002, "his" bath production



From left to right: Thomas Engert, Managing Director of Umicore, at the farewell celebration for Wilhelm Aichinger and Klaus Schettler.

Uwe Wohlfarth (new head of environmental protection and workplace safety) presented Dietmar Holdt (left) with a nice farewell present for his well-earned retirement.



facilities, including logistics, moved into the new Plant 2 in Klarenbergstrasse 79.

**Dietmar Holdt** began working in the electroplating department in 1974 as a technician and after a short time took over management of the test laboratories. He was appointed environmental protection officer. Later, this task was supplemented with the function of safety engineer. From 1978 to 1984, as deputy production manager, he was responsible for commissioning work in the electroplating shop. From 1985 he was responsible for reel to reel electroplating and for the sale of systems and equipment. A short time after this, to take account of the many new official regulations, all the tasks that had been previously distributed among various employees, such as environmental protection, safety, fire protection and the company improvement scheme and also hazardous goods, were aggregated and became the responsibility of Dietmar Holdt. He thus became the head of the environmental protection and workplace safety department.

**Klaus Schettler** joined Degussa in 1973 as a graduate engineer. Initially he was involved in planning and setting up the applied technology laboratory. The laboratory produced samples for the product range at that time, which included areas such as jewellery, pens and also the electronics industry. He was also responsible for customer support in the South Germany region. He then began optimising a system for scratch resistant coatings for motorcycle helmets and for spectacle frame coatings. In 1979 he became manager of the special parts electroplating department. Because of the rapid advances in the electronics industry the demands placed on electroplating systems also grew. The product range shifted mainly in the direction of technical coatings with gold and silver. The department also filled orders for the aerospace, machine engineering and textile industries.

## Personnel changes in sales



From left to right: A. Tiefenbacher, U. Seber, A. Grau and A. Klotz

**Thilo Kuhn**, head of International Sales for Umicore Galvanotechnik in Schwaebisch Gmuend for the last few years, has taken over a new position. In January 2005 he became manager of our subsidiary Umicore Precious Metals (Thailand) Ltd. in Bangkok. The company has 40 employees and supplies precious metal alloys in various forms to the jewellery industry. It also offers precious metal recovery from scrap and sweepings. For electroplating applications, Umicore in Bangkok supplies gold (AURUNA®), silver (ARGUNA®), platinum (PLATUNA®), palladium (PALLUNA®) and rhodium (RHODUNA®) electrolytes as well as the associated analytical services including technical customer support.

At Umicore Galvanotechnik in Schwaebisch Gmuend, **Andrea Grau** has taken over most of Mr Kuhn's tasks. Before this she worked for many years as an assistant in International Sales at Umicore. Additionally she worked for another company in Italy for several months. In her new position as head of International Sales, Ms Grau is responsible for the Far East, USA and Australia regions. Her main tasks include supporting Umicore branches and representatives and handling commercial inquiries.

**Uwe Seber** is responsible for the Africa, Near and Middle East and India regions. In future, Ms Grau and Mr Seber will report directly to **Albert Klotz**, Sales Manager of Umicore Galvanotechnik.

**Andreas Tiefenbacher** has been Technical Sales Manager for the last few months and is also a member of the management of Umicore Galvanotechnik in Schwaebisch Gmuend. Among other things, he is responsible for Printed Circuit Chemistry Sales, Key Account Management and Project Management.

## DGO surface finishing congress in 2004 and 2005

Last year, Umicore Galvanotechnik again took part in the surface finishing congress.

The DGO invited members and interested parties to the 42nd annual congress in the new international Congress Centre Dresden. One of the series of talks focussed on the subject of printed circuit boards. Andreas Tiefenbacher, Technical Sales Manager of Umicore, held a lecture on "Influences on the solderability of chemical nickel/immersed gold".



The highlight at Umicore Galvanotechnik during surface finishing congress 2004 was the traditional customer evening with important personalities from the electroplating industry.

The next surface finishing congress will be held from 21 - 23 September 2005 in Innsbruck, Austria.

Umicore employee Dr Franz Gassner from the Development and Application Technology department will talk about "Electrolytically deposited nickel-phosphorous alloys – functional materials with an underestimated potential?".

Umicore Galvanotechnik will also be present at the expert support exhibition with its interesting range of services.

## Middle East Meeting in Dubai

Information exchange between several Umicore foreign representatives.

Another meeting of Umicore representatives and sales partners in the Middle East was held in Dubai. The objective of the meeting was an intensive exchange of experiences in regard to markets, products and new developments. A desert safari and a trip on a dhow (historical sailing-boat) rounded off the meeting.



The participants on the beach in Dubai.

## Umicore Board of Management visited Schwaebisch Gmuend

Very satisfied with the electroplating business.

In May 2005 the Board of Management of the Belgian Umicore Group visited Umicore Galvanotechnik GmbH, Schwaebisch Gmuend. Within the framework of an employee meeting with the approximately 170 employees in Schwaebisch Gmuend, Umicore CEO Thomas Leysen together with all the other board members underlined the outstanding reputation that Umicore Galvanotechnik GmbH has in the entire company.

During a subsequent visit of the plant, Manager Thomas Engert informed the board members about the various areas of work carried out in the individual research and development departments and about the new production and logistics building.



Thomas Engert (fifth from right), Manager of Umicore Galvanotechnik GmbH, Schwaebisch Gmuend with the entire Umicore Board of Management.

## Athletic Umicore workforce

Many Umicore employees in Schwaebisch Gmuend are very keen sportsmen and women.

For the 5th time, Umicore Galvanotechnik entered a company team for the "14th Schwaebische Alb Marathon" in October 2004. At approximately 1,100 metres above sea level the course crossed the "Drei-Kaiser-Berge" with a total distance of 50 km. With a relay team of 10 persons each runner must run 5 km – a lot of this up and down hill the mountains. Umicore Galvanotechnik achieved a very good fifth position in 4.14 hours among 20 company relay teams.

Many individual runners deserve a great deal of respect for their efforts, too.



The Umicore team during the „12-Hour Run“ in June 2005.

Another sporting event, the "12-Hour Run" in Schwaebisch Gmuend, is held each year in June for a charitable purpose. For the seventh time, Umicore took part with approx. 20 employees; that is, from 8 am to 8 pm one runner is always on the 938 metre long course. The kilometres that are run are converted into euros (1 euro/km) and sponsored.

With 168,45 km, Umicore was again able to achieve 2<sup>nd</sup> position – as they did last year.

# CHEMET in India

- a respected name for chemicals and precious metals.



CHEMET  
company logo



CHEMET company building  
in Mumbai, India.

CHEMET – Umicore Galvanotechnik's representative in India and founded in 1968, is currently one of the oldest and largest trading companies in India. Large international companies in different segments such as agricultural chemistry, pharmaceuticals and precious metal products are represented on an exclusive basis. CHEMET offers many products that we need in our day to day lives.



Rahul Bhalekar in the well equipped customer laboratory.



Atish Sanghvi (2nd from left) and Rahul Bhalekar (right), both from CHEMET, talking with customers.

CHEMET has worked for Umicore Galvanotechnik for more than 20 years. With its headquarters in Mumbai and five other offices in all the important industrial centres in India, closeness to its customers and intensive support is guaranteed at CHEMET. A modern, well equipped laboratory for electroplating services is also available in Mumbai.

There are many different areas of application in India. Besides decorative layers for jewellery and articles used in day to day life, Umicore processes are also increasingly in use for technical applications.

In addition to RHODUNA® and AURUNA® electrolytes, MIRALLOY® processes are also increasingly used as a result of new environmental and customer requirements.

## Your opinion is as good as gold!

### IMPRINT

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