

# umicore goldpost

Issue 33/2012

The world of noble  
and functional surfaces



## Metoba - Finishing to perfection

The Umicore customer report

## Gold pieces from Gmuend

Gold plated DeLoreans

## Reflective

- The new fine silver electrolytes

The world of noble  
and functional surfaces

  
**umicore**  
Electroplating





Dear readers,

Smartphones and tablet PCs are gaining ground. Their users want bright displays and they expect a long battery life as well. Our new generation of fine silver electrolytes helps to fulfil both wishes: The LEDs coated with the new Umicore fine silver electrolytes reflect so strongly that the displays shine brilliantly – despite low power consumption.

On the following pages, in addition to innovative products I would like to present three new certificates from which you as our customers can profit as well: Facilitated processing of air cargo, preferential customs clearance and responsible, environmentally friendly process technologies.

Even more entertaining and interesting information is expecting you on the following pages. I wish you a lot of fun leafing through and reading our new Umicore Goldpost!

Yours sincerely,

Thomas Engert

President of Umicore Galvanotechnik GmbH

# umicore goldpost

## innovation

<b>Certified advantages</b>	4
Known Consignor, AEO-F certificate, RJC certificate	
<b>New: ARGUNA® 4500 and ARGUNA® 630</b>	5
Reflective - the new fine silver electrolytes	

## products

<b>AURUNA® 311</b>	3
Gold pieces from Gmuend - gold plated DeLoreans	
<b>Umicore Antitarnish 616 PLUS</b>	9
Protective clothing for silver – free from Cr(VI) compounds	

## report

<b>Metoba and Umicore: partners for 20 years</b>	6
Finishing professionals with innovative solutions	

## local

<b>New: Test plating department and office building</b>	10
Who wants to see hardworking craftsmen...	
<b>Umicore Far East Meeting 2012</b>	11
Fantastic atmosphere in Kota Kinabalu	
<b>Gold plated imperial crowns</b>	11
850 years of Schwaebisch Gmuend	

Always keeping track of current precious metal prices - with our Umicore App for all iPhone, Android and Blackberry users - now also available for Windows Mobile.

## IMPRINT

**Published by:** Umicore Galvanotechnik GmbH, Klärenbergstraße 53–79, D-73525 Schwaebisch Gmuend

**Editorial responsibility:** Umicore Galvanotechnik GmbH

**Design and Layout:** Umicore Galvanotechnik GmbH

**Text:** Umicore Galvanotechnik GmbH

© 2012 All rights reserved

Goldpost is available and can be downloaded as a pdf file from the Internet in German and English at [www.umicore-galvano.com](http://www.umicore-galvano.com).



Three golden boys from Gmuend into the world

# Gold pieces from Gmuend

**DeLorean DMC-12 – the futuristic stainless steel flounders came off the assembly line in Northern Irish Belfast. Umicore Electroplating presents very special gold pieces...**

The Christmas catalogue of the credit card company American Express used to be the most common US mail order catalogue. DeLorean made it to the front page with a literally bright idea: A 24 carat gold plated DMC-12. Three of these gold pieces were manufactured. In 1981, Umicore Electroplating was the only specialist company in the world which was able to directly plate stainless steel with gold, without an intermediate carrier layer of nickel.

Gerhard Steinhilber was the project manager at Umicore Electroplating. Since the large body panels did not fit into any of the tanks, Steinhilber for one week rented huge basins from the electroplating company Karl Holder which were usually reserved for chromium electrolytes. To make sure not to contaminate them with the gold electrolytes, they were lined with acid-proof plastic foil. In the meantime, Steinhilber and his colleagues made up 2,500 litres of the fine gold electrolyte AURUNA® 311. "For insurance reasons I had to drive behind the car transporting the gold bath from our premises to Holder – its gold content of about 10 kilos did re-

present a certain value. This was quite a hot thing", Steinhilber remembers with a smile.

All parts were manually degreased with a solvent, then they were spray-degreased. The thickness of the gold deposit was exactly specified: 0.0025 millimetre, which meant about 560 grams of gold deposited per car. "This layer thickness was chosen so that the body would actually be corrosion-resistant", says Gerhard Steinhilber.

At the outdoor weathering station of Umicore Electroplating, a gold plated DMC-12 boot lid can still be found which has been withstanding the elements for almost 30 years now. After gold plating, the panel surfaces remained untreated since the gold layer provided sufficient protection and any protective lacquer would have spoilt the visual effect. "Because of the brushed structure of the panels, more fine details could be seen in the gold surface than in the stainless steel surface," says Gerhard Steinhilber enthusiastically.

Today all three golden DMC-12 can be found in the USA. One copy since its delivery stood in a glass case in the Snyder National Bank, without ever having driven a single metre. After more than 20 immobile years, the car was freed from its case and



You can hardly tell them apart: Replica and "genuine" gold plated DeLoreans. This copy with many gold plated parts was built for advertising photos.

transported to the Petersen Automotive Museum in Los Angeles as a loan. The second model is still eking out a sad existence in the National Automotive Museum in Reno, with just 2,307 kilometres on its mileometer after its shocked first owner did not want to move it any longer on account of the horrendous insurance premiums... The third golden boy is the last officially manufactured DeLorean DMC-12 which was built from spare parts in 1983.

© Michael Schäfer, Stephan Lindloff / by kind permission of BRITISH CLASSICS Magazin





Confirmed responsibility -

# Certified advantages

Umicore Electroplating is always happy to fulfil customers' wishes - with regard to certification as well. Certificates can give a quick overview of the standards a business partner meets. But certificates also mean direct benefits for the customers.

## "Known Consignor" – saves time and money

Cost, time and competitive benefits. Three wishes all at once which Umicore Electroplating gladly fulfils. Since May 2012, the company has been listed by the German Federal Aviation Office (Luftfahrtbundesamt) in the EU database for "Known Consignors and Regulated Agents". The approval simplifies the entire processing of the air cargo. The cargo can be directly delivered to the airport by Regulated Agents - mostly forwarders. Before being loaded into the airplane, the goods are not subject to any further security checks. This will save the customers time and money.

The "Known Consignor" status is a quality label for the firm. The customer can be sure that the products are shipped by air freight in accordance with all legally required security standards.

## AEO-F Certificate – certified reliability

Umicore Galvanotechnik GmbH was granted the AEO Certificate "Customs Simplifications/Security and Safety" (AEO-F). As an "Authorised Economic Operator (AEO)", the company from Gmuend is regarded as a particularly trustworthy and reliable supplier in international trade. AEO-F certification is the highest internationally recognized seal of quality issued by the customs authorities.



Umicore employees with the AEO certificate hot off the press (from left to right: Steffen Barth, Sabine Barth, Dieter Straehle, Uwe Wohlfarth, Heinz Rosenauer and Karl Hieber).

With the AEO certificate, the World Customs Organisation guarantees the security of the entire international supply chain, from the manufacturer of a product to the end user. For customers of certified firms, this means that due to preferential customs clearance air cargo can be delivered more quickly in the cross-border exchange of goods. They also profit from a cost-oriented customs risk management.

## RJC Certification – social responsibility and environment

The RJC's mission are process technologies which are responsible, ethically founded and environmentally friendly. The core objective of the RJC is to enhance consumer confidence in the jewellery industry and their suppliers from the precious metal

and precious stone industries. Umicore Electroplating is aware of its responsibility and will promote socially oriented, environmentally friendly process technologies - represented by Allgemeine Gold- und Silberscheideanstalt AG.

The RJC, headquartered in London, is an international non-profit organization with more than 350 member companies from the gold and jewellery industries. To achieve its objectives, the RJC practices a certification process for companies within the supply chain to qualify according to the RJC Code of Practice criteria.



Markus Legeler

Tel.: +49 7171 607-204

markus.legeler@eu.umicore.com



ARGUNA® 4500 and ARGUNA® 630

# Reflective

## - the new fine silver electrolytes

The ultra-bright white layers of the new generation of fine silver electrolytes reflect like mirrors. LED applications such as the backlights of smartphones and tablet PCs thus shine brilliantly. And even at low energy consumption. The innovative products developed by Umicore Electroplating convince with many advantages.

### ARGUNA® 4500

The bright silver electrolyte ARGUNA® 4500 is intended for the high-speed deposition of ultra-bright coatings with excellent bonding, soldering and adhesive properties.

It is used for the selective deposition of bright silver layers in continuous lines using flow and spray technologies such as jet or spot plating modules. Applicable current density and plating speed mainly depend on the electrolyte agitation at the parts, i.e. on the flow velocity in the plant. Under optimum conditions, layers with extreme brightness and reflectance can be produced. The electrolyte works with insoluble anodes and can be operated with very low concentrations of free cyanide.

Due to its high reflectivity, ARGUNA® 4500 is particularly suitable for the contact surfaces of electrical components, for semiconductor devices as well as leadframe packaging for soldering, bonding and adhesive applications.

### ARGUNA® 630

ARGUNA® 630 is a fine silver electrolyte for (electro-) technical and decorative applications. Depending on the operating parameters chosen, the electrolyte can be used in continuous lines as well as for rack and barrel plating. Due to its very good electrical properties and excellent bonding and soldering characteristics.

Because of its reflection density of up to 1.5 GAM and the high temperature resistance of the coatings, the electrolyte can also be used for final finishes on LEDs. Operating temperatures of up to 40 °C are possible. ARGUNA® 630 can be operated in continuous lines using flow and spray technologies for the overall and selective silver plating of strip material.

The electrolyte is particularly suitable for the contact surfaces of electronic components, for coated wires as high-quality conducting material in medical technology and aerospace industry and as LED final finish.

LED backlight coated with ARGUNA® 4500.



Friedrich Talgner

Tel.: +49 7171 607-322

[friedrich.talgner@eu.umicore.com](mailto:friedrich.talgner@eu.umicore.com)





Metoba

## Finishing professionals with innovative solutions

**Metoba Metalloberflächenbearbeitung GmbH from Luedenscheid is a very modern industrial enterprise providing innovative solutions. Ultra-modern technologies are the standard. The finishing professional offers its customers, mainly from the automotive and electrical industries, specialized products for electroplating. A suitable production technology for every demand: Reel-to-reel, barrel, rack or vibrobot finishing, or own developments such as the Metoba selective technology. Quality, environment and safety at work are always given priority.**

For ten years now, the brothers Dr Sven Hering (commercial director) and Thorsten Hering (technical director) have been successfully managing the family-owned business in the third generation. "We have been working with modern reel-to-reel lines with brush technology for 20 years, we can plate strip material either on one or on both sides", says Dr. Sven Hering. Thorsten Hering remembers: "The first business contact with Umicore Electroplating developed in 1992. When installing two plating cells in

our automatic barrel plating line for the gold plating of connectors and contacts, we were looking for a suitable electrolyte. Norbert Hunke, our contact at Umicore, offered us with AURUNA® 527 the golden solution. The process works in a very precious metal saving way due to a uniform thickness ratio between the outside and inside of hollow parts. It has a long lifetime and it is very stable – even with continuous operation." With its excellent throwing power, the electrolyte has been successfully used at Metoba to this day.

### Innovative solutions

In March 2012, Metoba enlarged its production by 1,800 m². "We have put a new reel-to-reel plating line into operation – one of the most modern ones in Europe" informs Jens Schulte, production manager of reel-to-reel plating, and adds: "It allows faster processing of the strip material and even higher precision in selective plating." The company invested about 3 million euros in the new production hall on the company premises and the line. In





the line, copper, copper alloys, steels and stainless steels can be electrolytically coated. Strip material and pre-stamped strip material up to a width of 80 millimetres and a thickness of 0.8 millimetre can be plated either overall or selectively. The pallet winder for fully automatic feeding of the material into the line can carry a maximum of 2 metric tons. A single coil may have a maximum weight of 500 kilograms.

Gold, silver, nickel, copper, bright or matt tin can be applied as required; in the case of nickel with a tolerance of 0.5 to 1 millimetre, for instance. Gold can be selectively deposited with great precision on one side only or even in the centre of the strip. "This means we can consider-

The directors Dr Sven Hering and Thorsten Hering, technical manager Andreas Klette, Jens Schulte, production manager of reel-to-reel plating, and Georg Tillmann, technical sales, are pleased to be able to offer their customers even more services in the field of surface finishing (from left to right).



Selective gold plating to the highest precision.





ably reduce the consumption of the expensive precious metal and meet the specific demands and wishes of our customers. For the technical realization, we have used further Umicore high-speed electrolytes this year, after convincing test series", says Thorsten Hering and commends:

"AURUNA® 8100 is an excellent choice for the selective deposition of hard gold. With it, we can deposit abrasion-resistant, low-pore and easily solderable coatings on a number of different strip materials."

With selective silver deposition, ARGUNA® ET-S was the winner in Jetlab tests. The process can be operated in our reel-to-reel line at extremely high current densities. The particularly high plating speeds allow very short processing times, the contact surfaces exhibit very good soldering, bonding and adhesive properties.

During the Umicore product training, Jens Schulte points out the advantages once again: "I like the bath! It is very easy to use and it is fast." Currently, Metoba altogether operates 4 reel-to-reel lines as well as 10 barrel and 5 rack plating systems. In the medium term, further reel-to-reel lines are to be installed in the new production hall.



Metoba and Umicore - a successful partnership for 20 years.

### Novel Metoba selective technology

In 2005, Metoba celebrated its 50th company anniversary and the putting into operation of a new reel-to-reel line with brush technology for selective precious metal finishing. "In 2007, the novel Metoba selective technology went into operation – a line for the partial gold plating of "bulk contacts" we have developed ourselves," says Marcel Fahrenstueck, production manager rack. The Umicore specialists for precious metal solutions recommended the innovative high-performance electrolyte AURUNA® 523. This weakly acidic gold-nickel process is characterized by excellent thickness distribution and high current efficiency. Sockets and connectors are provided with corrosion-resistant hard gold coatings in this way.

### Environment and quality are given high priority

In addition to the protection of the environment, above all quality assurance is given high priority at Metoba. The certification of the QM system according to DIN EN ISO 9001:2008 documents the high quality level of the products. Dr Sven Hering says: "Constantly rising demands on the products require the reliable safeguarding of a high and consistent quality.

Our laboratory continuously monitors all process parameters necessary for the optimum operation of the treatment baths. Any deviations are immediately noticed and corrective measures can be taken within a very short time. Our quality assurance measures are documented by



**New: Umicore Antitarnish 616 PLUS**

# Protective clothing for silver

Umicore Antitarnish 616 is an organic antitarnish process based on nanotechnology. Special nanopolymers absorb on the silver surface and cross-link to form a protective layer of a few nanometres thickness. If Makeup Salt PLUS is additionally used and an electrical voltage is applied, the antitarnish can be applied to the surfaces to be protected in an even better and safer way.

Mainly in Asia, tons of jewellery are still being treated with antitarnish processes containing highly toxic, ecologically harmful and carcinogenic chromium(VI) compounds (so-called chromate treatments). This jewellery also ends up with consumers in the western world.

Chromate treatments are inexpensive. In Asian countries, often a 5 %  $K_2S$  test has to be additionally passed: During a 3 minute period, the silver layers may not change colour. This was impossible using the antitarnish processes free from chromium(VI) available on the market up to now. With the new, innovative Umicore Antitarnish 616 PLUS this test can be passed. However, generally a 2 %  $K_2S$  immersion test should better be carried out for 3 minutes: During chromating, the substrate, silver for instance, will be dissolved and the dissolved metal ions will be co-deposited

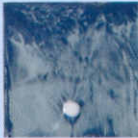


in the chromate layer. I.e. the chromate layers contain the carcinogenic chromium(VI) compounds. Using more than 0.1 per cent by weight of hexavalent chromium in electrical and electronic equipment is banned according to the EU RoHS directive. In China, the content of chromium(VI) compounds in jewellery is even restricted to 0.01 per cent by weight.

**Advantages at a glance**

- + Antitarnish process for silver and other metal surfaces
- + Free from restricted-use Cr(VI) compounds
- + Biologically safe, skin-friendly and hypoallergenic
- + Dirt and water repellent
- + Suitable for rack, barrel and continuous lines

**Comparative test****5 % potassium sulphide solution, 25°C**

Unprotected	614	616	616 PLUS
after 30s	after 120s	after 120s	after 120s
			

intermediate and final inspections. Corrosion behaviour, layer thicknesses, solderability and wear properties of the plated parts are tested, for instance. The exact testing of layer thicknesses by means of x-ray fluorescence spectroscopy in every important phase of order processing allows the specific access to article-related and quality-relevant characteristics of the parts."

Product quality, protection of the environment and customer service are high on Metoba's list of priorities. Thorsten Hering is pleased to have found a partner with the same priorities in Umicore Electroplating. "We very much appreciate the competent and fast customer service as well as the open and always constructive co-operation with Umicore."

Metoba's commitment in the fields of safety at work and training on the job is quite exceptional. In 2005, they were awarded the training certificate of the employment agency for outstanding commitment in promoting young talent. Further awards followed, among others they were "Supplier of the year" in 2008 in the category service provider of the Association of the German Spring Industry and in 2011 they were given a certificate of the Steinbeis foundation "for high customer satisfaction". Umicore Electroplating offers its warmest congratulations.

**Metoba Metalloberflächenbearbeitung GmbH**

**Founded:** 1955 in Luedenscheid

**Staff:** 85 (2012)

**Services:**

Electrolytic finishing of metal parts for the automotive and electrical industries in particular.

[www.metoba.de](http://www.metoba.de)



Martin Stegmaier

Tel.: +49 7171 607-305

[martin.stegmaier@eu.umicore.com](mailto:martin.stegmaier@eu.umicore.com)



## New: Test plating department and sales building

# Who wants to see hardworking craftsmen...

You can see construction work everywhere in Schwaebisch Gmuend at the moment, not just on the site of the 2014 regional garden show. On the company premises of Umicore Electroplating, curious onlookers have been seeing quite a few changes in 2012.

### New centre for training customers

In the new training centre, customers can plate samples together with Umicore staff of the technical customer service. The users can test Umicore electrolytes on a beaker scale or by means of application-specific function tests in Hull cells or the Jetlab before using them in future productions series.

### Mobile and efficient – the test plating department

Due to the two-dimensional modular system, the equipment of the test plating department is highly flexible and variable. Everything can be refitted in next to no time. This concept allows to move the containers to different locations. The electrolytes do not have to be filled into other tanks for this purpose. Just power supply and outgoing air have to be reconnected.

### New building – technical sales department

"Finally we're all under the same roof". Thilo Kuhn, head of Technical Sales, is pleased. It took only a short time to build a completely new office building for the technical sales department on the premises of Umicore Electroplating. In October, the seven members of the field service and the head of the department could move into the new building. This means shorter distances to the laboratories, making customer service and internal communication much easier. The sunny open-plan office is equipped with the latest technology. A large conference room is available for both visitors and staff.



Training in the completely new training centre with modular containers in 200 litre units which can be reduced to 100 litres.

The new test plating department works with a direct current supply of up to approx. 150 amperes, overflow filtration and adjustable flow of the cathode as well as localized ventilation.

New office building for the technical sales department with open-plan office, meeting corner and conference room.





# Fantastic atmosphere

Every two years, Umicore Electroplating invites to a meeting in South-East Asia. 49 employees from Schwaebisch Gmuend and the representations abroad met this year in October to get to know each other, to exchange experiences and for training. In Malaysian Kota Kinabalu, the participants from 14 different countries exchanged information. Among other things on the successful market launch of ARGUNA® silver electrolytes for LED applications and RHODUNA® Alloy for jewellery and decorative articles. The conference was rounded off with workshops and presentations from the fields of non-precious metals and electrocatalytic electrodes.



"Cultural Village": Sunday outing to mark the beginning of the seminar lasting several days.

## 850 years of City of Schwaebisch Gmuend

# Gold plated imperial crowns

In July, the Staufer age became alive again in Schwaebisch Gmuend for the 850th anniversary of the town. The oldest Staufer town in southern Germany remembered its medieval past with the Staufer days. More than 1,000 volunteers from Schwaebisch Gmuend and its surroundings participated as actors, extras or in honorary groups. The "Staufer Saga" told the dramatic story of the Staufer dynasty – from the rise of the Staufer over the crownings of the emperors Friedrich I (Barbarossa) and Friedrich II to the execution of Konradin in Naples. For this glorious spectacle many gowns and 17 imperial and royal crowns were made true to the original. The students from the University of Design Schwaebisch Gmuend used historic and innovative gold and silver working techniques when creating and manufacturing the crowns. Many crosses, sceptres, amulets and pendants were reproduced as well.

Umicore Electroplating participated in the gold plating of these copies with the AURUNA® 311 gold electrolyte. Its colour and brightness make the electrolyte particularly suitable for this purpose. The coatings are highly corrosion-resistant and scratch-proof.

## The return of the imperial crown

For the town's anniversary as well, sponsors made a reconstruction of the imperial crown possible. The original is kept in Vienna. The town of Schwaebisch Gmuend was given this exquisite birthday present. Umicore Electroplating also plated this piece of jewellery with AURUNA® 311.



A cast of more than 1,000 actors turned the performance of the Staufer Saga into an unforgettable event.







Perfect surfaces  
are our passion.

Lake Matheson in New Zealand has a perfect surface. It reflects the nature and the mountains, one to one. Nature's perfection is the model for our surfaces.

Umicore Electroplating is a global leader in the production of electrolytes and anodes used to ennoble surfaces. Whether it is jewellery, automobile or communication technology – the world of noble and functional surfaces offers endless possibilities.

[www.umicore-galvano.com](http://www.umicore-galvano.com)

The world of noble  
and functional surfaces



**umicore**  
Electroplating