

Issue 30/2008

GOLD POST

For friends and
associates
of Umicore
Galvanotechnik

**New: Antitarnish 615,
AURUNA® 500 and
Black Ruthenium 479**

Platinized niobium anodes

**PCB: "High-performance"
products of TAIYO**

**Umicore – worldwide
competence in precious metals**

Selective plating at METOBA

Dear Business Partners,

we are proud that this 30th issue of our Goldpost allows us to present you with up-to-date insights into events at our company and news from all over the world.

Umicore Galvanotechnik has once again successfully completed a very busy year. Our employees covered millions of kilometres by car, rail or plane to work out improvements together with our customers on the spot. The successful use of electroplating processes depends to a large extent on the user's specific operating conditions. Often it is details which decide on the success of a new process. In our opinion, constructive dialogue between users and system specialists is the key to success.

Customer proximity is the main motivation for targeted foreign investments by our business unit.

The most up-to-date investment project comprises a factory in south China. At the moment, the project to build a precious metal production and refinery in Nanhai, in the Guangdong province, has been authorised by all the responsible





authorities, and now implementation is beginning. Umicore has long been active in China. As early as three decades ago, Umicore products and services were in demand in China. However, in order to further expand business and set up competitively for the future, presence on the local market is essential. It is planned for production to begin in the second half of 2009.

CIP, or continuous process of improvement process with the motto "making good better", has in the meantime proved itself to be a recognised production tool, and has also been developed in all areas of office work. Within 18 months, more than 2,000 weak points were documented and measures to remedy them were taken. The effective implementation of these measures is constantly monitored and is at a very high level. In spite of our relatively brief experience with CIP, our very first external benchmark in the sales department achieved world-class standard. For 2008, several projects have already been created to increase the efficiency of processes which go beyond individual departments. By means of process mapping, complicated processes are divided up chronologically into handy, clear individual subjects, influence parameters are systematically analysed and potential for improvement is shown. Involving all the employees concerned in the process reveals amazing potential. In the meantime, we have successfully made our initial experiences available to all those interested in the form of a seminar jointly organised with the Kaizen Institute.

Research is the key to innovation and growth. We are glad to be developing new, innovative ideas for your applications with you, and here too we seek a close and constructive dialogue. Visit us in Schwäbisch Gmünd or invite one of our specialists – we are already looking forward to interesting discussions with you.

Kind regards from Schwäbisch Gmünd !

Thomas Engert

Managing Director
Umicore Galvanotechnik GmbH
Schwäbisch Gmünd

Front page:
Umicore – worldwide competence in precious metals

Fair Review

In 2007, Umicore Galvanotechnik participated in important international trade fairs:

At the **CPCA Show, Shanghai (China)**, 21 - 23 March 2007, the **KPCA Show in Seoul (South Korea)**, 10 - 12 April 2007 and the **TPCA Show, Taipei (Taiwan)**, 3 - 5 October 2007, Umicore Galvanotechnik together with its partners introduced three new RoHS-compliant final finishes to the Asian market: **NIRUNA® ENiG** with its lead-free electroless nickel electrolyte, the immersion gold electrolyte **AURUNA® 511** as well as the autocatalytically produced gold surface from **AURUNA® 516** and the innovative **IP** process.



Fair photos from CPCA in Shanghai and KPCA in Seoul

Hannover Fair: 16 - 20 April 2007

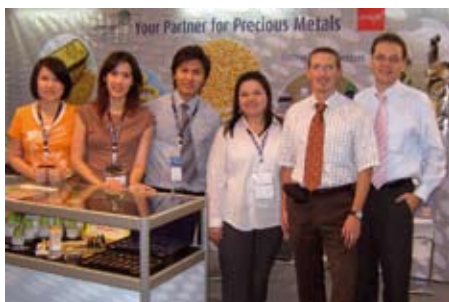
At the joint **ZVO** stand at the trade fair for surface technology, Umicore Galvanotechnik presented e.g. the electrolyte **AURUNA® 312** with uncritical R+S classification, **PALLUNA® 469**, which is increasingly used for connectors, and **PLATINODE® 167** (MMO anodes) for use in **MIRALLOY®** electrolytes.

CircuiTex Suzhou (China): 16 - 18 May 2007
Umicore Galvanotechnik was represented by its Taiwanese technology partner **AGES**. Umicore products are mainly used as final finishes on printed circuit boards. Besides the well-established **AURUNA® 530** for e. g. connectors and **AURUNA® 5000** for bonding, **NIRUNA®**, **AURUNA® 516** and the **IP** process were presented.

Bangkok Jewellery Show (Thailand):

18 - 22 September 2007

Once again Umicore Precious Metals (Thailand) Ltd. participated in this important international jewellery fair. Besides the complete range of electroplating products, jewellery metals and refining services were presented.



The fair team in Bangkok

Productronica for electronics production, Munich: 12 - 16 November 2007

Umicore presented its new developments for gold-wire bondable final finishes. With modern precious metal processes for functional applications in the fields of connectors and printed circuit boards, the company has been a valued system specialist in the electronics industry for a long time. To intensify these activities, sales partnerships with leading companies in the printed circuit board supply industry were concluded. Through these co-operations with **Uyemura** and **Taiyo**, Umicore Galvanotechnik can now offer a complete range of electroless and electrolytic processes for final printed circuit board finishes.

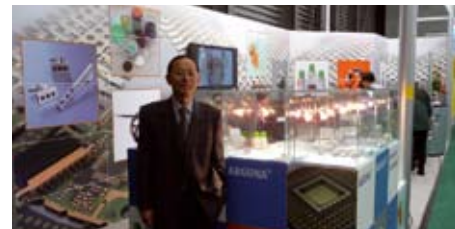


Fair stand at Productronica

SF China, Shanghai (China):

21 - 23 November 2007

At this international trade fair, Umicore mainly focused on **MIRALLOY®** for technical and decorative applications and on **PLATINODE®**.



Company presentation at SF China

HK PCA, Hong Kong (China):

5 - 7 December 2007

For the first time, Umicore Galvanotechnik and **UMS Hong Kong** contributed to this important fair for the PCB industry. The visitors showed great interest, especially in **ENiG** and **IP**.

Fair Preview

O & S – Oberflächentechnik, Stuttgart:

3 - 5 June 2008

SUR/FIN Indianapolis (USA):

16 - 18 June 2008

India International Jewellery Show:

7 - 11 August 2008

SF China, Guangzhou (China):

18 - 20 November 2008

Internat. PC & Electronics Assembly, Shenzhen (China):

3 - 5 December 2008

Setting standards: Noble colours "Black meets Red" by Umicore Galvanotechnik

New precious metal processes for decorative applications: Black Ruthenium 479 and gold-copper AURUNA® 500. The colours are in great demand for e. g. jewellery, writing utensils, bathroom fittings, spectacle frames and in the automotive industry.

Umicore Galvanotechnik has succeeded in developing a black ruthenium electrolyte from which not just grey to anthracite but previously unattainable dark to black layers can be deposited. The blackness of the layers can be very easily adjusted by means of the blackening agent.

Up to now, it has only been possible to electrolytically produce such dark layers with black rhodium or black nickel processes. Since nickel may cause allergies, however, it must not be used in many areas. At current precious metal prices, the cost savings of black ruthenium compared to black rhodium are approx. 90 per cent. Thus the new **Black Ruthenium 479** is a cost-effective, nickel-free alternative to black rhodium. Brightness-retaining, corrosion- and tarnish-resistant layer thicknesses up to 0.3 µm can be produced.



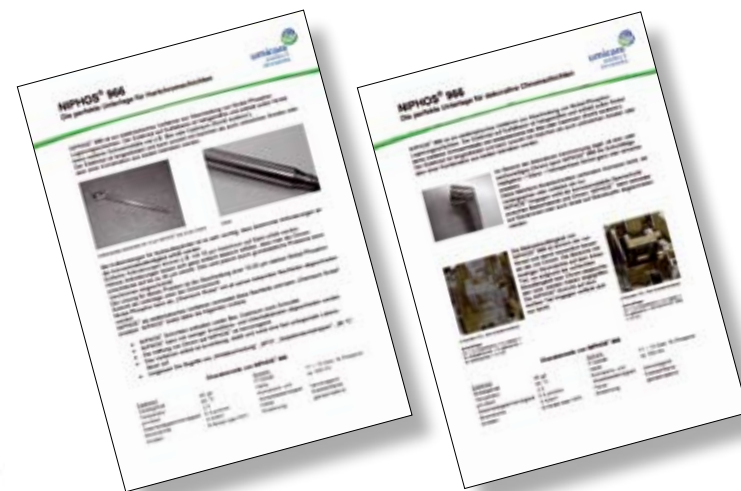
Attractive rosé gold

From the new gold-copper electrolyte **AURUNA® 500**, hard, abrasion-resistant 18 carat red gold layers up to 20 µm can be deposited. They resist tarnishing and corrosion. The coatings with a hardness of up to 400 HV are primarily used for decorative but also for technical applications. **AURUNA® 500** is completely free from cadmium and has a stable pH-value of approx. 7. For electronic components, the layers are RoHS-compliant. The users obtain an electrolyte which optimally meets the requirements of a stable, environmentally friendly and precious metal-saving process.

NIPHOS® 966

The perfect base layer for hard chromium layers and decorative chromium layers.

NIPHOS® 966 is an electrolytic process for the deposition of nickel-phosphorus alloy layers for technical and decorative applications. The sulphate based electrolyte is free of halogenides and apart from nickel contains no further heavy metals such as lead or cadmium (RoHS compliant!). The process is long-term stable and can be used with soluble as well as insoluble anodes or a combination of both systems.



Information sheets about both products **NIPHOS® 966** are available at www.UMICORE-galvano.com in the "Downloads" directory or can be ordered by mail: galvano@eu.UMICORE.com

New Antitarnish 615

Product group of Antitarnish processes 328, 613 and 614 extended by the skin-friendly Antitarnish 615.

This process is a medium based on nanotechnology for protecting gold, silver, rhodium, platinum and palladium against tarnishing. Treated surfaces are protected from tarnish effects for a prolonged period. A thin, invisible protective layer is applied by simple immersion in the metal-free antitarnish based on ethanol. This layer protects the basic material from oxidation and discoloration without adversely affecting the solderability.

Antitarnish 615 for rack and barrel applications is kind to the skin and do not cause any allergies. It additionally protects against scratches and abrasion and is dirt and water repellent. Subsequent treatment or repair by grinding and polishing is not impeded. The coating is inconspicuous and the precious metal remains recyclable.



Silver jewellery coated with Umicore Antitarnish 615

Platinized niobium anodes excellent for use in halogen-containing electrolytes

Niobium is an ideal base material for manufacturing anodes due to its very good corrosion resistance, above all to halogen-containing media. Because of its very ignobel potential and therefore its high affinity to oxygen, niobium forms an extremely stable oxide layer in contact with oxygen.

In this way the uncoated areas of an anode are protected against corrosive attack by formation of a niobium oxide layer. These properties make niobium outstandingly corrosion- resistant which shows in a longer lifetime of the platinum/niobium system.

Considering the almost double density of niobium, the price is nearly six times higher compared to standard titanium. Nevertheless, niobium is used as base material in the manufacture of anodes in special fields of application where halogen-containing electrolytes are used. The positive properties of niobium considerably improve the service life of the anode system, thus compensating for the striking difference in price.



Platinized niobium anode segments for hard chromium plating of piston

One of the applications among others is the hard chromium plating of piston rings in the automotive, commercial vehicle and ship-building industries. The modified electrolytes used build ceramic components into the layer to improve the abrasion behavior of the hard chromium deposit. Fluoride is used as a catalyst which makes the use of niobium as base material absolutely necessary.

The platinum layer deposited on niobium is of extremely high purity (99.99 % platinum), it has a low hardness (< 100 HV) and exhibits high ductility and adhesion as well as low porosity. These properties result from the composition of the platinum molten salt bath and its operating parameters. Platinum is deposited by means of the Umicore high temperature electrolysis process (HTE).



Platinized niobium anode (on the left) compared to a platinized titanium anode (on the right): When used in halogen-containing electrolytes, oxide formation due to the poorer corrosion resistance of titanium will cause lift-offs and therefore “peeling off” of the platinum layer. Niobium as base material on the other hand is highly corrosion-resistant.

The good corrosion resistance of the base material in combination with the outstanding layer properties of the HTE platinum layers meet the highest quality demands. As regards lifetime, aqueously deposited platinum layers due to their layers properties are not comparable for these applications.

The demand for niobium as base material in combination with HTE platinum of Umicore Galvanotechnik is constantly increasing. For Umicore, this indicates that the demands on an anode system require “best performance and longest life at the same time”.

Umicore Galvanotechnik worldwide supplies a large number of anodes in the field of hard chromium plating of piston rings. Among them are well-known automotive component suppliers from Germany, Europe, USA, China, Japan, Korea and Taiwan.

More information:
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Elephant-headed god made of ARGUNA® 621

Probably the largest-ever galvano-formed sculpture, “Lord Ganesh” was produced by the Whorra company of Delhi, India. This lucky god, 23 kg in weight, was made with the bright silver electrolyte ARGUNA® 621 from Umicore Galvanotechnik.

The lucky elephant god enjoys great popularity in the Indian population. Parvati, the wife of Shiva, used mud and water from the Ganges to make a figure which became the human Ganesh. When Shiva met the young, naked man in front of his bedroom, he cut his head off in a fit of blind rage. The repentant Shiva resolved that the first living

creature to pass by would have to provide the head for his own son (Ganesh).

Ganesh is riding on a rat. This is to show symbolically that even such a small animal has enough energy to carry an elephant.

At the beginning of March 2008, the Whorra company introduced this figure as a great eye-catcher at a trade fair in Delhi.

Deepak Whorra (right) with his son Arjun Whorra made the huge elephant god in their workshops with ARGUNA® 621



Umicore Galvanotechnik looks back on an innovative “KAIZEN year”

Less wastefulness, setting standards, optimizing processes – slogans which have arrived in the offices of Umicore Galvanotechnik since the introduction of Kaizen in Schwaebisch Gmuend, too. Ever increasing administrative requirements, resulting from the complexity of the field of work, motivate a special kind of quality offensive.

KAIZEN comes from the Japanese and means “change” (= kai) “for the better” (= zen). In the Western countries, this concept is better known as “continuous improvement process”. Automotive companies such as Toyota have known for decades how to successfully include their employees in the optimization of work routines. Since the beginning of the nineties, European companies as well have been using their employees as experts in the workplace.

It is perfectly natural for the KAIZEN Institute in Bad Homburg to always optimize the work in the office, to lift blockades in work routines and to minimize wasting. At Umicore Galvanotechnik, too, the maxim has been “Improve the good” since introducing KAIZEN in their offices. This and many other ways of thinking have been communicated to Umicore management and process companions from individual departments in an interesting, witty but also insistent way in training courses by the KAIZEN Institute.

- Steps of the 5 S campaign
1. Sort out

2. Straighten

3. Scrub

4. Standardize

5. Sustain/Self-discipline

The advantage of a 5S campaign is that the employees come to know and train the methods from scratch. Among them standards, visual management, collecting of code numbers and an awareness of order systems.

Particular attention was paid to the desk. A “model workplace” was designed by teamwork. Ergonomics, creating workspace, fast and simple reachability of the things frequently needed every day and good orientation at the workplace in the case of deputizing were the goals to reach. In the meantime, a team of experts has been set up to help pass on this knowledge on to all employees working at desks. Top priority is not to force anything on anybody but to grant the freedom to design the personal workplace. When designing the individual workplace, care is also taken that private things can still be kept there.



5S campaign - before (bottom) and after (top)

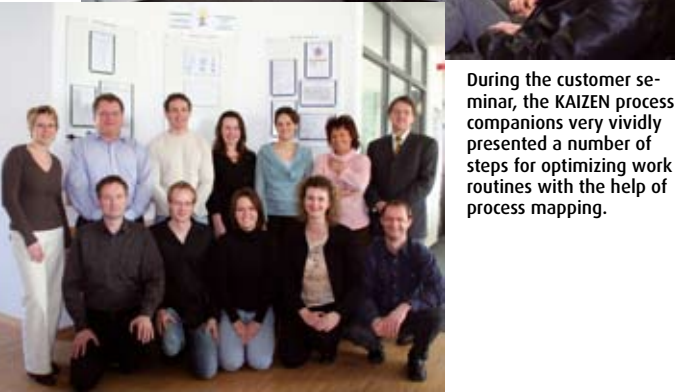


So-called “no man’s lands” such as copying and printing stations, stocks of stationary and office supplies and kitchen were sorted out and standardized. So every week another employee has the task to fill up the stocks of stationary and office supplies organized with the help of routing cards. At the new copying and printing station, one person is responsible for filling the paper trays to prevent print jobs piling up. These measures help not to lose sight of the essentials during the day at the office. As a positive side effect, qualities from the Japanese system of education - such as striving for harmony and community spirit – find their way into the department.

In the meantime, the newly developed look with the “KAIZEN eye” has questioned many matter-of-fact activities and work routines. Work lists, circulars and forms have for instance been digitalized and made centrally available in order to minimize search times and paper consumption. It is necessary to continue to support this momentum of its own. Umicore offers a further incentive by rewarding the improvements elaborated. These “earnings” are credited to the department’s account and can be freely disposed of.

For the future it is important to turn the striving for improvement in the right direction. For this purpose the company’s goals will be communicated and measurable code numbers determined. Goals and code numbers can e. g. be guided by the times from receipt of order till dispatch, faithfulness to deadlines and suggestions for improvement per employee and year or employee satisfaction.

According to the philosophy of the Toyota managers: “Whenever you think you’re good - you can do even better.”



The sales processing team, Europe and International, at their Kaizen board.

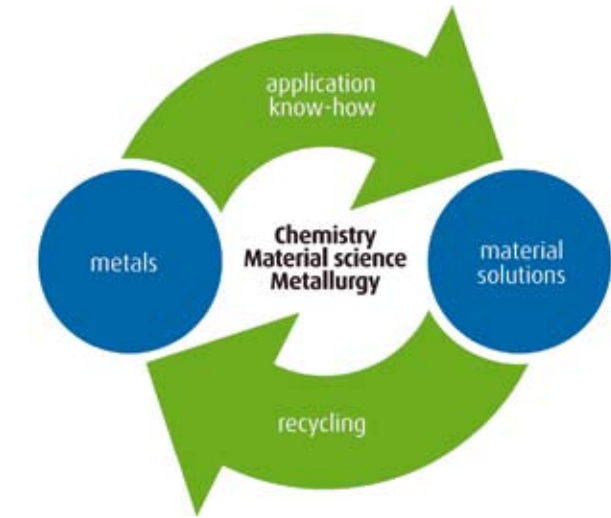
At the end of November 2007, a customer seminar “Introduction to KAIZEN” was successfully carried out together with Allgemeine Gold- und Silberscheideanstalt, Pforzheim and the KAIZEN Institute, Bad Homburg. The participants among others were employers, company and department managers interested in the benefits of KAIZEN and thinking about an introduction. The educational goal was: How can we systematically and sustainably reduce waste in production and office? How can we save time and money with small steps and simple means? At the end of the seminar, all participants felt very enthusiastic and were highly motivated, above all by the “KAIZEN live” walk onsite, the visits to offices, production and logistics and the KAIZEN process companions who presented everything very vividly.

UMICORE – worldwide leading by competence in the fields of precious metals and special materials

Umicore AG, headquartered in Brussels (Belgium), is the biggest recycler of precious metals and leading manufacturer of a large number of products containing precious and base metals and special materials. The group is continuously investing in the expansion of innovative technologies. In this way the complex methods of materials processing and recycling are made even more efficient and flexible to further increase the technological lead.

Umicore currently employs a staff of approx. 15,000 and generated a turnover of about 8.3 billion euros in 2007. The company was founded in 1909 as a state mining company named Union Minière. In the 1990s, the firm developed into a metals and materials group which changed its name to Umicore in the year 2000.

In 2003, Umicore acquired the precious metal activities of the former Degussa AG. Among them refinery and processing of and trade with precious metals. The company became a group for special products in the fields of metallurgy, material sciences and chemistry and now focuses on those application areas where the know-how about these products offers a decisive competitive advantage. Among them are products of everyday life just as the latest technological developments. Umicore’s primary target is creating sustainable values for its customers. Developing and manufacturing products as well as providing services is in accordance with the company’s motto: “Materials for a better life”.

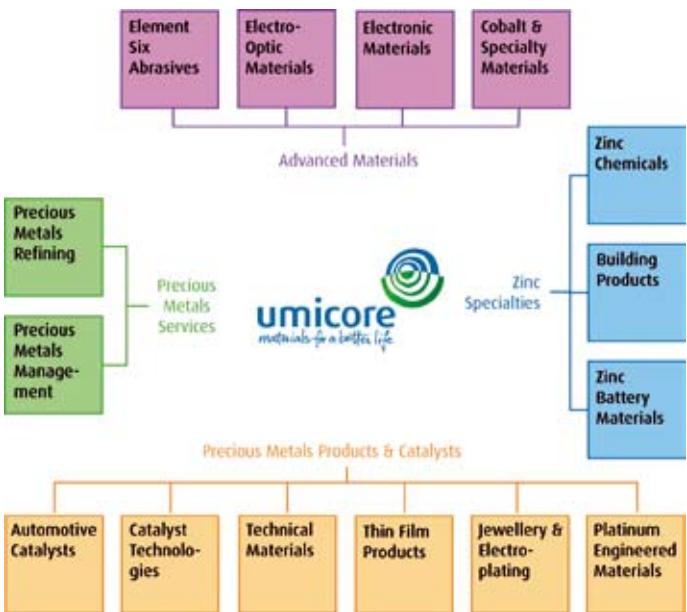


The Umicore approach to materials technology

Umicore business areas

Today, Umicore’s activities are centred on four business areas (see organigram):

- **Advanced Materials**
(e. g. electro-optical materials, nickel- and cobalt-containing powders)
- **Precious Metals Services**
(trade with and recycling of precious metals)
- **Precious Metals Products & Catalysts**
(e. g. automotive catalysts, jewellery and electroplating)
- **Zinc Specialties** (zinc alloys, zinc chemicals as well as products for the building sector)



All four Umicore business areas at a glance

The Jewellery & Electroplating unit belongs to the business area Precious Metals Products & Catalysts. Umicore Galvanotechnik GmbH in Schwaebisch Gmuend is part of this unit as well. This business unit has been dealing with the electrodeposition of precious metals for functional and decorative applications for decades. Umicore Galvanotechnik is now one of the leading suppliers of precious metal electrolytes and special processes for electroplating.



Umicore precious metals (ingots, granulates, salts and solutions)

Precious metal uses

Precious metals have been fascinating mankind for thousands of years. In antiquity, gold mostly served as means of payment and even at that time it was an important base material for the craftsman’s art. Most of the gold is still used in the jewellery industry. At the moment, the largest amount of gold is processed in India. The use of precious metals for industrial purposes has been continuously rising for years. Fine gold and fine silver, for instance, are increasingly being used in electronics and electrotechnology. The amount of gold consumption is about 4,000 tons per year.

Gold has an excellent electrical conductivity and is therefore perfectly suitable for electronic components, ensuring a reliable transfer of electrical signals in the low voltage and light current fields. Since electronics are getting more and more complicated and the miniaturisation trend is continuing, increasingly efficient precious metal layers are required which have to be deposited with maximum precision and speed.

The platinum group metals, mainly platinum, palladium, rhodium and ruthenium, are often used in the chemical industry and in automotive catalysts but in many areas of daily life as well.

In electroplating for instance, platinum is often used for the decorative plating of jewellery, bathroom fittings and high-quality writing utensils. Palladium layers act as diffusion barriers and often serve in the decorative field as intermediate layers (nickel substitute) or as white final layers. Rhodium surfaces are primarily encountered in the jewellery and watch sectors, but on electronic components too. Ruthenium is used, among others, for plating bathroom fittings, carat and costume jewellery as well as fashion accessories. It is often selectively deposited on gold layers to achieve colour effects rich in contrast.

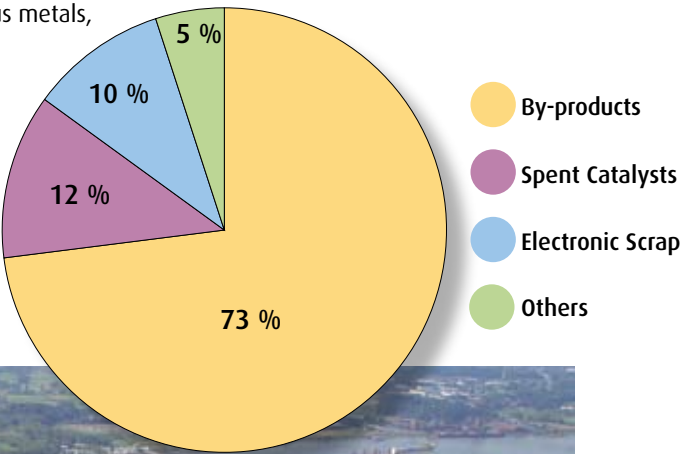
Precious metal recovery

The business area Umicore Precious Metals Refining is a worldwide leader in the field of precious metals recovery. Economic processes and competent service are offered for a wide range of industrial intermediate and final products containing precious metals (e.g. automotive catalysts, electronic scrap, sweeps and jewellery). Umicore recycles and sells gold, silver and platinum group metals and returns them in this way to the product cycle. Almost 30 per cent of the demand for gold, for instance, comes back to the market after recycling.

Important Umicore locations for “precious metals refining” are Umicore in Hoboken, Belgium; Umicore in Hanau-Wolfgang; Allgemeine Gold- und Silberscheideanstalt in Pforzheim; Ögussa in Vienna, Austria and Schöne Edelmetaal in Amsterdam, Netherlands.

Hoboken, for instance, was completely renewed at the beginning of 2000 and is now using innovative, sustainable technologies and processes. Flexible recycling and refinery methods make it possible to process a large number of materials containing precious metals, base metals and special metals.

The following diagram gives an overview of different recyclable materials delivered to Hoboken for recovery.



Umicore “Precious Metals Refining” location Hoboken in Belgium

Precious metals management

Umicore’s precious metals management ensures the supply of its worldwide customers with precious metals and offers customized “integral” solutions. A team of experts is permanently watching the London fixings and all important market information. In addition the metals trade helps in an advisory function with financing, leasing, transfers and purchases of precious metals.



The experts in the precious metals trade

“Materials for a better world”

Umicore makes every possible effort to use all resources in an ecological, environmentally friendly and sustainable way. As one of the world’s leading suppliers and recyclers of precious and non-ferrous metals, it is Umicore’s responsibility to apply the most stringent standards according to the state of the art.

Umicore Galvanotechnik expands their distribution activities in the printed circuit board (PCB) segment by offering “high-performance” products from TAIYO INK

Ever increasing miniaturization of electronic components is driving the technical requirements of PCB in terms of packaging density (fig. 1). Especially for mid- and high-layer count PCB's the “via-in-pad” technology is gaining more and more acceptance in Europe.

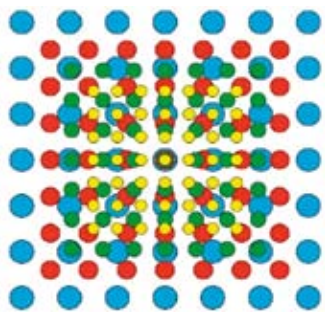


Fig. 1: Real-estate improvement by smaller pitch size and identical I/O count- schematically

“Via-in-pad” technology uses the real-estate of a drilled via hole to directly interconnect it with the next layer or to create a landing pad for component assembly. The via hole needs to be completely filled with Cu or with a non-conductive ink than can be overplated with copper. The former “dogbone” design can be eliminated with such an approach (Fig. 2a + 2b).

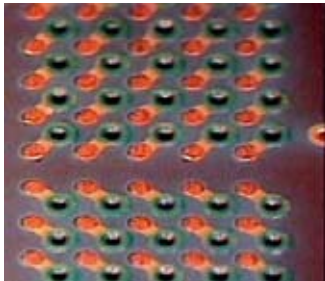


Fig. 2a: BGA-area (1 mm pitch) “dogbone”

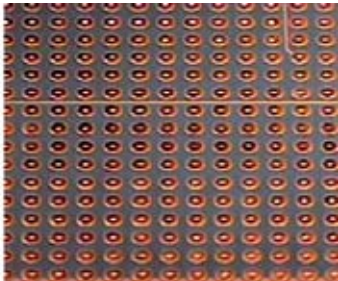


Fig. 2b: BGA-area (0.5 mm pitch) “via-in-pad”

This requires a complete filling and overplating of the via hole. In the case of μ -vias this is mostly accomplished by making use of a dedicated Cu-electrolyte with high throwing power that evenly fills the μ -vias holes.

In the case of plated through holes (PTH's) the filling is mostly done using distinctive hole filling inks. These materials are mostly 1-component, non-conductive inks. Their thermo-mechanical properties (CTE and Tg) have to be adapted to the values of the base materials of the stack-up.

In addition to the filling of PTH's for outer layer pads the same process (sequence see fig. 3) is also applied for the filling and overplating of buried vias and their landing pads on layer 1+n. In this case the following thermo-mechanical properties of the hole filling ink play a vital role concerning the reliability:

- low CTE value (<35ppm/K below TG, as low as possible > Tg)
- high Tg (> 160 °C)
- void-free hole filling is possible
- excellent adhesion to the hole barrel

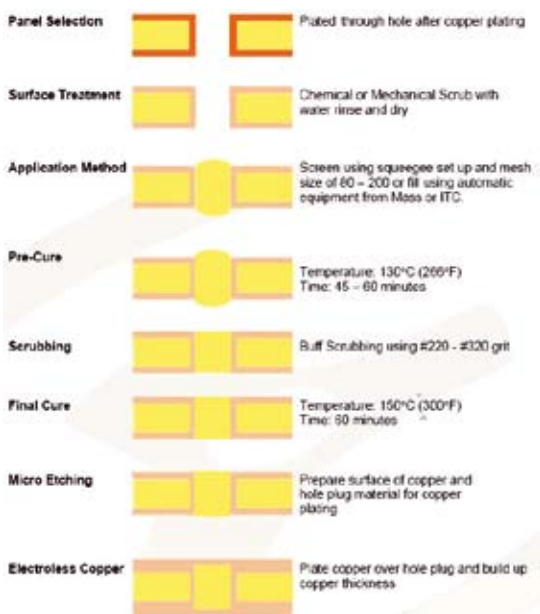
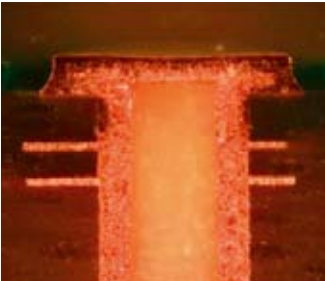


Fig. 3: Process sequence “hole filling”

Due to higher aspect ratio constructions and more severe thermal stresses (e. g. lead-free soldering) the requirements are rising for both base materials as well as hole filling materials.



Fig. 4: 3.1 mm thick PCB with 0.35 mm PTH (filled and overplated)



Such high-layer HDI PCB's have enjoyed a significant growth in the recent years in both USA and Europe. This was leading to the introduction of so called “vacuum via filling machines” (fig. 5). Those devices are now able to apply highly-viscous inks without air entrapment (causing reliability issues) into PTH's and μ -vias.



Fig. 5: Vacuum via filling unit ITC THP-30

TAIYO has been active in responding to these industry trends by developing the plugging (or hole-filling) ink THP-100DX1. The product has been introduced for approx 3 years into North America, Asia and now Europe.

THP-100DX1 exhibits a particularly low CTE ($\alpha_1=31$ ppm/K, $\alpha_2=115$ ppm/K) as well as a high Tg (162 °C, TMA). In addition, THP-100DX1 has improved grinding or planarization behavior. This differentiates TAIYO's ink from competitive products.

THP-100DX1 is available in standard cans but also in pre-filled and deaerated cartridges. The time-consuming and messy filling of the paste reservoir is hereby eliminated. Using cartridges also helps to reliably avoid bubble formation due to application mistakes (e. g. inadequate pre-filling).



Fig. 6: THP-100DX1 in cans and cartridges

In combination with the THP-100DX1 cartridge, TAIYO also offers a non-reactive cleaning ink (DX Flush-Out) in order to purge all residual ink from the vacuum via filling machines during shutdown or changeover of the machine. DX Flush-Out significantly reduces cleaning and set-up of the vacuum via filling machines.

Properties of TAIYO THP-100DX1 at a glance:

- extraordinary thermo-mechanical properties (see data above)
- ease in application
- no special desmear process needed
- deaerated and great adhesion to the hole barrel
- halogen-free, ROHS-compatible, exceeds NASA-outgassing requirements
- high PCT and thermal resistance, very low shrinkage

I.T.C. Intercircuit Production GmbH has recognized these advantages for their plugging services and offers the hole-filling with TAIYO THP-100DX1 as job-shop service since November 2007 for the European PCB market.

Your contact:

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Tel. +49 (0) 3721 3992-0
www.itc-intercircuit.de



Always on your side.

Umicore Solar Team grabs number two spot in World Solar Challenge race

Belgian materials-technology group Umicore was thrilled by the news that the Umicore Solar Team had grabbed the number two spot during the 20th anniversary of the Panasonic World Solar Challenge, a 3.000 km long race connecting the north and south of Australia, with nothing more than the sun to power the vehicles.

Umicore, the main sponsor of the team, has been impressed by the drive, dedication and sheer professionalism of this group of 14 students and recently graduated engineers who have dedicated 18 months to design, build and actually drive a solar car across the harsh Australian outback.

If nothing else, the result of the race marks a tribute to what the dedication of young minds can achieve. The team will be making a tour across Belgium during the summer of 2008 to demonstrate the technical excellence of their vehicle.

“We are immensely proud of the achievements of the team. Not only did they put up a magnificent performance, they acted as true ambassadors of how solar energy can help turn our society in a more sustainable one.” Umicore Chief Technology Officer Marc Van Sande said.

Umicore again supplied the germanium substrates to power the vehicle which looks increasingly like a regular car, including a sophisticated suspension and lights. The driver for example has to be able to exit the car without assistance and safety rules require bars fitted into the frame to protect the driver.

The Umicore Solar Team was the first Belgian team to take part in the 2005 edition of the race, grabbing the 11th spot.



The Umicore Solar Team finished in second place during the Panasonic World Solar Challenge in Australia on October 26th, 2007. The “Umicar Infinity” is equipped with germanium substrates from Umicore to capture the sunlight and to help cross the 5-day race from Darwin to Adelaide, connecting the north and the south of the continent, across a 3.000-kilometre distance.

Employees retiring from Umicore Galvanotechnik

Farewell-Party for Erich Braun, the longest-serving employee at Umicore Galvanotechnik, Gerolf Proksch and Peter Wingenfeld.

In mid-October, Umicore Galvanotechnik GmbH said farewell to his technical employee, **Erich Braun**, who is taking a well-earned retirement. Mr Braun has been employed at Umicore in Schwaebisch Gmuend for 45,5 years, which makes him Umicore's longest-serving colleague. During this time, connections and personal relationships have arisen which go far beyond everyday work.



On his retirement after 45,5 years of service, Erich Braun received a "survival kit" from his colleagues. Heidrun Pinteritz (department of electroplating, operations office) and Sascha Christmann (Production Manager Plating Job Shop) handed over the present to him.

On 12 April 1962, Erich Braun began working in the rolling mill of the former company, Dr. Walter & Schmitt. After successfully retraining as an electroplater in 1976, he worked in experimental electroplating. Thanks to his good specialist knowledge, hard work and motivation, he was promoted in 1985 to become foreman in the department of barrel plating. Erich Braun always passed on his great stock of specialist knowledge to the young electroplaters during their vocational training.

Shortly before Christmas the colleagues said farewell to their electroplating specialist, **Gerolf Proksch**. In 2007 he was able to celebrate the 40th anniversary of employment with the company, a rare achievement. Gerolf Proksch began his training as an electroplater at the age of 15, also at Dr. Walter & Schmitt. After successfully completing his apprenticeship and working for a short time, he attended the technical training school for electroplaters in Schwaebisch Gmuend. In the summer of 1970 the young electroplating specialist returned to the company which had trained him and was employed in the



Gerolf Proksch (with his leaving present) and his colleagues from the departments of "Technical and Decorative Precious Metals" and the management of Umicore Galvanotechnik.

precious metals laboratory. This interesting work in the "decorative precious metals" department at Umicore was a source of inspiration to him to the very last day of his work.

There was a certain amount of sadness in the two celebrations, as the management thanked the new pensioners for their personal commitment and cooperative spirit, and wished them good luck, good health and all the best for the new phase of their lives. The works council and employees also said goodbye to them in a personal and friendly atmosphere.

Peter Wingenfeld left Umicore Galvanotechnik for personal reasons at the end of January 2008. From 1975 to 1980 he studied surface technology / materials technology at the Polytechnic in Aalen and began work on 1 September 1980 as a graduate engineer (FH) at the then Degussa AG in Schwaebisch Gmuend. Until the end of 1983 he was deputy head of the department of surface refinement in the electro-technical business area. In these first few years he built the foundations of his knowledge of strip technology, with a very wide range of selective technologies.

After being transferred from the specialised electroplated parts department, he worked from October 1993 to the present in applications technology, in the department of technical precious metals. There he was responsible for the development and modification of technical processes for precious metals.

His hobby was and remains selective coating. In the period of 1986/88 he developed the AURUNA® selective module according to the principle of tampon electroplating, with which, on endlessly stamped metal strips (usually connector elements), precious metal can be selectively deposited. This also led to further patents. He was very popular with customers and employees, and especially valued for his specialist knowledge.



Peter Wingenfeld in the "Technical Precious Metals" laboratory.

Far East Meeting in Vietnam

Every two years, Umicore Galvanotechnik organizes a seminar for Umicore subsidiaries and sales representatives in the Far East.

In October 2007, this event took place in Ho Chi Minh City (the former Saigon) in Vietnam for the first time. Umicore Galvanotechnik was pleased that 40 persons from 11 countries attended the meeting.

Electroplating specialists from Schwaebisch Gmuend introduced newly developed and modified products to their Asian colleagues, followed by detailed technical discussions. During workshops, the participants exchanged experiences about markets, applications and products.



All participants in the Far East Meeting

Technical Training by Umicore Thailand

In June 2007, a "Umicore Technical Training – Pre-alloys & Electroplating" was held at the "Holiday Inn Silom" for the first time.

Pre-alloy specialists from the Italian company Progold and experienced electroplating technicians from Umicore Precious Metals (Thailand) comprehensively answered the participants' detailed questions. This was highly appreciated by the 40 guests from well-known jewellery manufacturers in Thailand.

It is expected that a similar training with further interesting topics for jewellery manufacturers will be organized again in the near future.



Specialists from Umicore Precious Metals (Thailand) Ltd. and Progold

Great third place in the "Schwaebisch Alb Marathon"

At the end of October 2007, ten colleagues from Umicore Galvanotechnik competed for the eighth time in the "17th Schwaebisch Alb Marathon" in the relay race. With an overall distance of 50 km and a difference in altitude of 1,100 metres, the course crossed the "Drei-Kaiser-Berge" around Schwaebisch Gmuend again.

As one of 26 company relay teams, the Umicore team reached an excellent third place as in the year before - in 4 hours, 3 minutes and 19 seconds, they crossed the finishing line 10 minutes earlier than in 2006, however.



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



From left (top): Felix Mayer, Gerhard Steinhilber, Dieter Strähle, Paul Schurr und Andreas Boschmann; from left (bottom): Karin Barth, Philipp Zoidl und Christoph Betz; not on the photo: Andreas Groß and Michael Stegmaier

Metoba

Modern technology and proven traditions!

The Metoba Metaloberflächenbearbeitung GmbH in Lüdenscheid has developed in more than 50 years from its craftsmanship beginnings to a very modern industrial company.

Founded in Lüdenscheid in 1955 by a master of electroplating and metal polishing Heinrich Hering, the company was further expanded by his son Klaus Hering and his wife Eveline Hering to its current location on Königsberger Strasse.

Since 2002, Metoba is managed by the third generation: Dr. Sven Hering, Thorsten Hering and Ute Thräms. Along with a current workforce of 87 employees, they are facing up to their tasks with team spirit and very strong motivation.

Like many companies in the region Metoba's own construction skills are of major importance. A large part of the coating lines were created in-house, from the first drawing to the commissioning. Since 1992 Metoba has a modern reel to reel line with brush technology which is equipped for one-sided and two-sided strip refinement.



The MST equipment for partial gold plating of bulk goods-contact parts.

At the Hanover trade fair of 2007 Metoba presented a production unit/facility which permits bulk goods to be partially coated. The level of the precious metal electrolyte is fitted to the MST (Metoba Selective Technology) equipment for the varied coated parts. Instead of transporting the contact components in the rotating body of a barrel from one treatment bath to the next, the contact components are led through the process solutions on a special plating process. With this a great number of application possibilities emerge which saves large amounts of precious metal.

For this MST equipment, the well approved electrolyte **AURUNA® 527** is successfully used for gold plating in the barrel process. The process permits an excellent throwing power, the best possible coating thickness distribution and is stable in the long term.

Metoba also uses **NIPHOS® 965** from Umicore. From this, a nickel-phosphorus alloy is deposited electrolytically; combined with a final precious metal coating, this demonstrates ideal contact qualities.

AURUNA® 523 is a modern versatile process for the gold plating of band goods, which is also used by Metoba. This high performance electrolyte is slightly acidic with an excellent coating thickness distribution and a current efficiency which provides a wide range of uses. The coatings are hard and abrasion-proof and have a low and stable contact resistance.

Metoba can take pride in a number of acceptances such as the "Quality seal for qualified coaters" which was awarded to the company or in the official recognition as the "Most women-friendly company" in North Rhine-Westphalia in 1989, and in the prize for innovation in social commitment of 2007, given by the Sauerland Initiative.

The company is also awarded for its efforts in the field of environmental protection and through its exceptionally high commitment to training on the job. A training of apprentices quota of more than 20 percent and the award of the training certificate for 2005 by the Federal Labour Agency underline this achievement.

Certification under DIN EN ISO 9001:2000 and an environmental management system under EU Eco Audit Directive, also called EMAS (Eco-Management and Audit Scheme), underlines the picture of a medium-sized company with a young and innovative workforce.

Perfectly prepared for all the requirements of the coming years, Metoba looks forward to the future with optimism.

More information at: www.metoba.de



Photo above: Bulk goods contacts, partially gilded with **AURUNA® 527** in the MST equipment.

Photo below: Contacts (plating strip) selectively gilded and tin-plated with **AURUNA® 523**.



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