




umicore
Electroplating

Right Composition.
Perfect Surface.

Umicore Electroplating

**WE ARE ONE OF THE WORLD'S LEADING PRODUCERS
OF ELECTROLYTES AND ELECTRODES FOR SURFACE FINISHING.**

Dear customers and prospective customers,

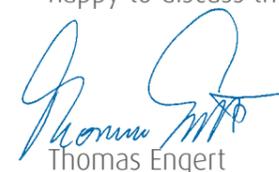
from the outside, it may seem like a game involving chemical elements and electric conductors when we create electrolytes and electrodes - and a playful sense of creativity does actually help us alongside skills and motivation on our path towards the perfect surface finish. Get an overview of our company and the ways we can help you.

Since our founding in 1888, and even since we joined the Belgian Umicore group, our base has been Schwäbisch Gmünd. Here, 200 specialists develop, produce and sell electroplating products. Furthermore, our customers can reach sales and service representatives in around 60 countries.

In our laboratory, we continually develop new electrolytes and processes for you. 50 specialists work on improving our products and finding solutions for your challenges each and every day. Reliably targeting and tackling special market and customer needs is one of our strengths.

As a well networked company, we also work closely with regional associations and institutions. This includes the Zentrum für Oberflächentechnik Schwäbisch Gmünd e.V. (Z.O.G.), Hochschule Aalen - Technik und Wirtschaft (HTW) and the Forschungsinstitut Edelmetalle + Metallchemie (fem) to name just a few.

If the following pages provide you with more than an interesting insight, I would be happy to discuss the perfect surface finish for your product.



Thomas Engert
Senior Vice President Business Unit Electroplating

Thomas Engert (Senior Vice President Business Unit Electroplating) and the experts of Umicore Electroplating demonstrate that 'Made in Germany' stands for quality and innovation at any time.

Our Products

THEY ARE USED IN THE JEWELLERY, CLOTHING, COMMUNICATION TECHNOLOGY AND AUTOMOBILE INDUSTRIES.



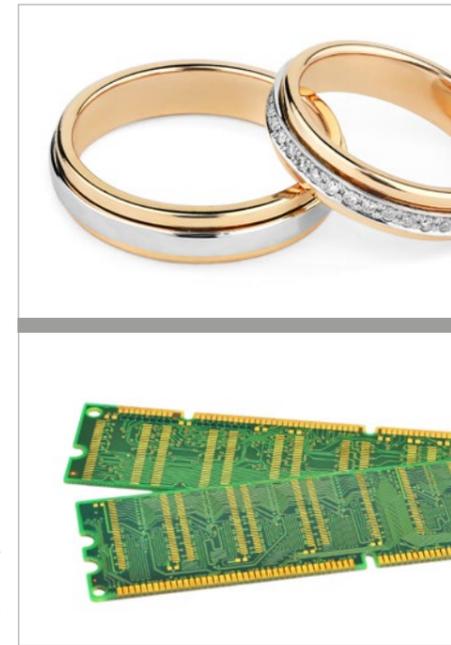
COMPREHENSIVE PRODUCT PORTFOLIO

Our wide product range (over 1,200 products) is enough to meet the most complex needs on the market. It includes precious metal electrolytes and compounds as well as selected plating techniques. Then we have our precious metal coated, dimensionally stable electrodes for electroplating processes or water treatment.

IMPROVING DECORATIVE & TECHNICAL PROPERTIES

Electroplating technology can be used to improve decorative properties such as colour, brightness, reflection or feel. But resistance to corrosion and wear, solidity, solderability and weldability as well as electrical properties can also be optimised. Your products and tools are given a high-quality finish.

AURUNA® Gold Electrolytes



Gold electrolytes from our AURUNA® range are some of the classics in our wide product portfolio.

Gold electrolytes are still top of the leader board when it comes to connectors, smart cards, printed circuit boards and many other electronics components. Various coloured gold electrolytes also add more shine and value to decorative products. Benefit from our decades of experiences in precious metal plating.

ARGUNA® Silver Electrolytes



Our silver finishes are suitable for decorative as well as technical applications.

Are you looking for silver electrolytes that provide perfect surfaces for decorative as well as technical applications - such as connectors or LEDs? We'll meet your exacting standards with our ARGUNA® range. And this isn't just proven in countless success stories from leading producers.

RHODUNA® Rhodium Electrolytes

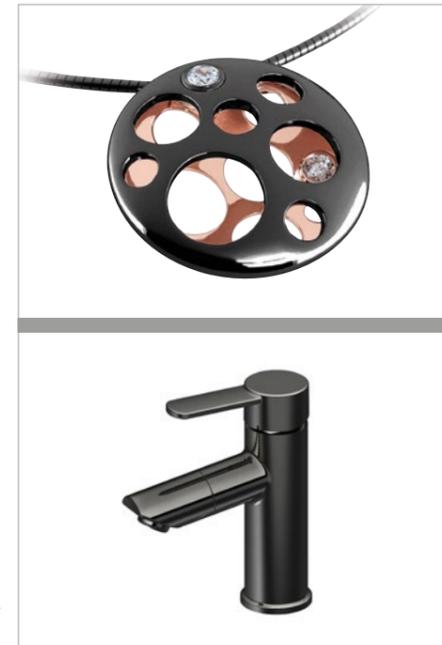
RHODUNA® facilitates brilliant white or deep black finishes.



Fashion jewellery, luxury jewellery or high-end writing implements: leading producers all around the globe place their trust in our rhodium electrolytes - such as the tried and tested RHODUNA® Alloy, our new RHODUNA® Diamond Bright or pen rhodium.

Even when it comes to technical applications, such as reed contacts, you'll always be a step ahead with our rhodium electrolytes.

RUTHUNA® Ruthenium Electrolytes

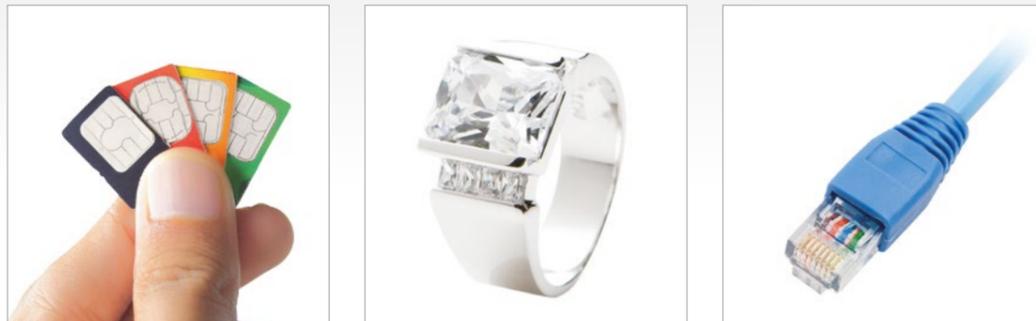


Ruthenium electrolytes stand out due to their anthracite-black colour.

Interesting fashion accessories, breathtaking bathroom fittings and sophisticated interiors in luxury limousines are set to impress with black finishes. Our ruthenium electrolytes are the perfect solution if you love rich, shiny black surfaces.

PALLUNA® Palladium Electrolytes

Palladium electrolytes are mostly used in functional applications as a cheaper alternative to hard gold layers.



Our palladium and nickel alloys (PdNi) replace hard gold, such as in the high-speed coating of connectors on conveyor systems. Palladium electrolytes are also free from ammonia and chloride. Palladium isn't just impressive when used in interim layers, diffusion barriers

and corrosion protection.

We also have the perfect palladium electrolyte for decorative uses.

PLATUNA® Platinum Electrolytes



Platinum is a tarnish-resistant and skin-friendly precious metal ideal for jewellery.

Our platinum electrolytes are a shining example that highlights our many years of unique precious metal skills worldwide. Leading market producers have been placing their trust in our PLATUNA® electrolytes to produce crack-free platinum surfaces for years.

Base Metal Electrolytes

Lawmakers require nickel-free objects to avoid allergic reactions.



Bronze electrolytes are an important part of our range. Our classic MIRALLOY® has been used worldwide especially in the clothing industry as a nickel-free and lead-free process for more than 30 years. These solderable and non-magnetic surfaces are also valued by

many customers on high-frequency connectors, in cars and on hydraulic components.

Our product NIPHOS® (a nickel phosphorous alloy) offers a range of benefits as a alternative to electroless nickel.

Pre- & Post-Treatment



Avoid corrosion and discolouration with the right pre- and post-treatment.

Tarnish protection is an increasingly important topic. Producers want effective protection to avoid corrosion and discolouration without impairing other properties, such as contact resistance. We offer exceptional solutions in Umicore Sealing 691 EL (for technical products) as well as Umicore Antitarnish 616 PLUS (for decorative products).

Anodes & Electrodes

We produce anodes of the highest quality especially to suit your needs.



We plan, design and build your platinum titanium or platinum niobium anodes. To this end, we use a coating process that is unique in all the world - high-temperature electrolysis (or the HTE process for short). This means that our products are high-quality, low-maintenance, cost-efficient

and environmentally friendly. For more than two decades, mixed metal oxide anodes have been produced and customised for many areas of application based on CAD-supported constructions.

Uyemura & Taiyo



Uyemura products for final finishing are known under the process names ENIG, EPIG, ENEPIG and ISIG.

As a PCB system specialist, we exclusively offer products from Japanese technology leaders Uyemura and Taiyo in Europe. They offer products for final finishing, copper fillings for through holes and blind micro vias, solder resist and flexible lacquer.

Our Research

AROUND 50 SPECIALISTS PERMANENTLY WORK IN SCHWAEBISCH GMUEND WITH THE AIM OF IMPROVING OUR PRODUCTS.

We are known and successful around the globe by our AURUNA®, ARGUNA®, RHODUNA® and MIRALLOY® brands to name but the best known names from our product portfolio. Based on precious metal skills developed over many years, new products and customer-specific modifications have been made to meet the increasing requirements of industrial production.

It's the combination that makes the difference, and not just with our electrolytes. Experienced and young employees benefit from each other.



Furthermore, economic and environmentally relevant reasons have driven us to offer new competitive products. For this reason, we invest around 10% of our turnover each year into research and development. Laboratory equipment and employee capacity and skills are significant success factors that are constantly adjusted to reflect requirements.



We have been awarded the state's regional 'Prize for Talent and Patents' several times.

Countless patents are testament to this innovative drive, confirming our important role in surface finish research. Our 50 highly qualified and creative specialists contribute towards this almost every day. This is how we manage to constantly develop our products and adapt to reflect current developments on the market as well as change the status quo with new achievements.

Dr. Sascha Berger (Laboratory Manager Research & Development) and his team create alloys for trendsetting surfaces.



Our Services

WE'RE THERE FOR YOU, FROM DEVELOPMENT TO MASS PRODUCTION
AND BEYOND AS A COMPETENT SERVICE PARTNER.



ANALYTICAL SERVICE

At locations such as Schwaebisch Gmuend, Tokyo and Hong Kong, our highly qualified staff examine around 8,000 electrolyte samples each year - for target levels of certain metals and additives as well as impurities. A comprehensive equipment fleet of highly sensitive sensors facilitates a wide range of measurements. So we can give you detailed information on how to optimise your processes.

WE ARE ALWAYS REACHABLE

You can reach a competent partner for your request at any time. We would be happy to advise you on the latest topics. And if we're unable to solve your problem remotely, our service technicians will be happy to provide on-site assistance. They will undertake analyses and sample processing as well as train your employees in how to further improve your processes. This saves costs and increases the quality of your products.

INDIVIDUAL SOLUTIONS

We offer a range of services to provide our customers with the best support possible. For example, we operate a test centre that lets us test electrolytes under real production conditions. This helps us push our new developments from test tube to electrolyte bath or find solutions for your challenges. So we come ever closer to our mutual aim of the perfect surface finish for your unique product.



Michael Ritz (Technical Services Plating Shop) and the team of the testcenter identify the ideal use of the electrolytes on a real scale at Schwaebisch Gmuend.



Executive Management at the Gold and Silver Forum in Schwaebisch Gmuend (left to right: Uwe Manz, Karl Hieber, Michael Herkommer, Thilo Kuhn, Thomas Engert)

Our Staff

WHAT BENEFITS OUR STAFF IS ALSO USEFUL TO OUR CUSTOMERS.

Together with the quality of our products, our 200 employees at Schwaebisch Gmuend and our 60 carefully selected representatives worldwide contribute to the company's overwhelmingly positive image. Identification and passion are the main reasons, as well as the specialist knowledge that our customers naturally expect.

Around one third of employees are taking part in various training programmes at any time. These include targeted one-on-one coaching programmes as well as group trainings. Alongside ever increasing specialist qualifications, the quality of communication between colleagues, with superiors and also with our customers is undergoing constant improvement. Apart from the standard offerings and activities, these promote a sense of togetherness

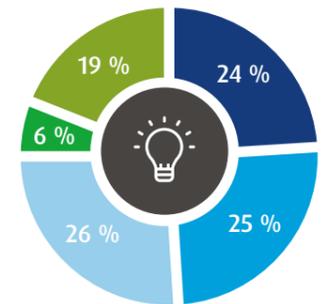
and mutual pursuance of goals. This is just one significant reason, apart from professional equipment, a modern working environment and much valued freedom, why we have frequently been awarded the title of top employer.



Our commitment has been confirmed again and again over the last few years by our certification as a 'top employer'.

This satisfaction is expressed in an average employment relationship of over 14 years - in a company that exclusively employs skilled workers, this provides a significant competitive edge. Our customers can rely on one competent contact person in the long term, which isn't just reflected in efficient processes. Our customers also express a great deal of trust in our business relationships on a personal level.

- Skilled workers**
- Engineers
 - Technicians
 - Technical Specialists
 - Business Administrators
 - Commercial Staff



Our Responsibility

ENVIRONMENTAL AND SOCIAL RESPONSIBILITY IS A MATTER FOR US AS A GLOBAL COMPANY.

We apply our philosophy, the 'Umicore way' far beyond life in the company. This sets out principles that regulate cooperation within our company, our dealings with the environment and social responsibility for our direct surroundings and society as a whole.

SOCIAL RESPONSIBILITY

We have obligated ourselves to stand up for basic human rights in all of our activities. We are committed to the communities around our location, and carry out open, transparent communication with our partners.

We have a training rate of around 10% in commercial and industrial fields. This exceeds internal demand, comprising an important contribution to society.



ENVIRONMENT

Credibility is our most important asset to our customers and our environment. That's why we don't just uphold environmental protection regulations but also make continuous contributions to preserving nature. For example, we place great value on not wasting resources and reusing raw materials as much as possible.

As a globally active company, we are familiar with the current status of REACH and GHS as well as other regulations in major markets such as the USA, China, Japan, Korea, Taiwan and many other countries. Of course, we support our customers and partners in upholding national and international health and environmental protection regulations.

Customers can also rely on our integrated management system with clear regulations on quality, environment and safety: for example, we check each batch in compliance with elaborate and mandatory requirements.



Countless certificates such as the TÜV certificate DIN ISO 14001:2015 (international environmental management norm) or the Responsible Jewellery Council (international standard for responsible trading in the precious metals industry) are testament to our future-orientated measures



Your Contact

DO YOU HAVE A NEW CHALLENGE OR A DEFINITIVE REQUEST?
THEN GET IN TOUCH WITH OUR COMPETENT SALES TEAM.



REPRESENTED WORLDWIDE

Our experts aren't limited to Schwabisch Gmuend; you can find them in over 60 countries.

Are you looking for a competent contact in your country? Visit our website. Here, you'll find our representative and the right contact person.



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SALES ELECTROCATALYTIC ELECTRODES

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Frank Friebel (Sales Manager Electrocatalytic Electrodes) and the team around him are planning and manufacturing tailor-made electrodes for highest electrochemical demands.

Give your product
the perfect surface.



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