

umicore goldpost

**Time is running out for lead anodes -
EU sets strict limits**

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Cobalt- and nickel-free hard gilding in unique quality

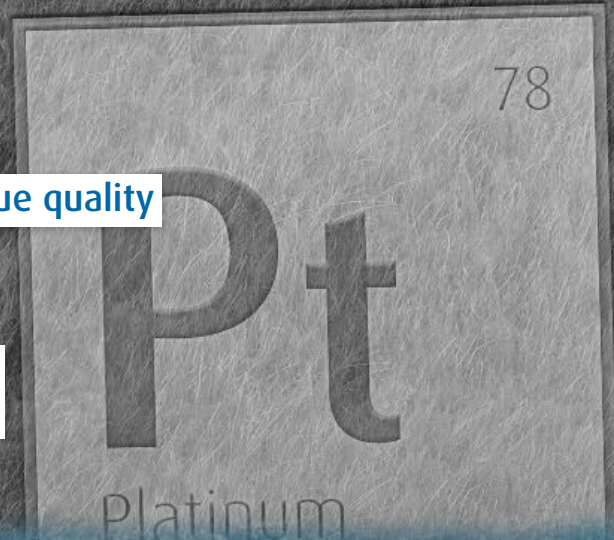
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**Umicore launches the world's widest range
of fully recycled precious metals**

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**Pioneering platinum coating of PEM
electrolyzer titanium components**

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In 2025, **Shanghai** will host Semicon China and SF China among others. We look forward to welcoming you to our booths again.



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On our website www.mds.umicore.com the Goldpost is available for download as a PDF file in the download section.

Dear readers,

Have you ever heard of VUCA? Google says: "VUCA stands for volatility, uncertainty, complexity and ambiguity. It describes the dynamic and often unpredictable challenges that companies face in today's world."



Since we can hardly escape these external influences, I am all the more pleased to take you with me in this new edition of Goldpost to changes, new topics, products and applications in plating.

On the one hand, our pioneering platinum coating of porous titanium transport layers (PTL) and bipolar plates (BPL) deserves special mention. Another highlight is the introduction of our recycled precious metals under the name Nexyclus™. This is our way of sending a strong signal in favor of sustainability and resource conservation. And last but not least, we are pleased to announce the opening of our new site for semiconductor applications in China.

As you can see, our initiatives are technologically complex, regionally diversified and balanced in terms of application technology, and have one goal: to further expand the continuity, innovation, sustainability and stability of Umicore Galvanotechnik GmbH – especially in times of VUCA.

I hope you enjoy reading and discovering the new Goldpost edition!

Your

Michael Herkommer
Managing Director

Umicore Inside - News overview



Opening of the new location in Suzhou

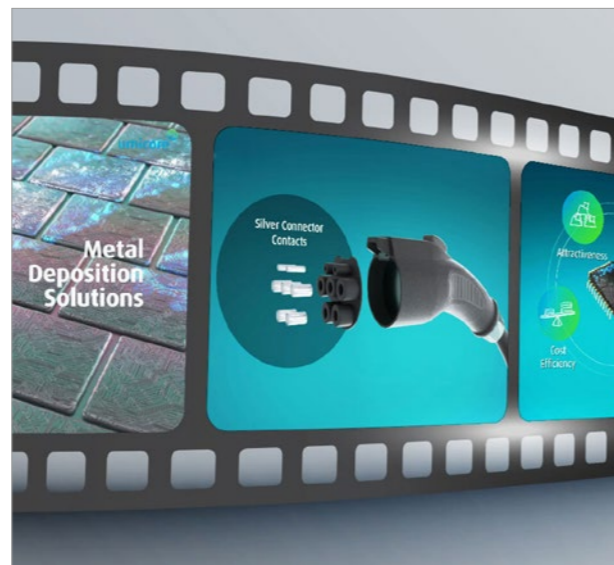
We are expanding our product offering for the growing semiconductor market by acquiring our Chinese partner Shinhao Materials LLC (Suzhou, China).

We and Shinhao joined forces in 2019 to combine Shinhao's technical expertise and intellectual property in copper additives with our global infrastructure. With our subsidiary Umicore Suzhou Semiconductor Materials Co., Ltd (USSM), which emerged from the acquisition, we have now definitively achieved this.

What we do and how our customers can benefit from it

What exactly is behind our coating processes? And what advantages does high-quality surface coating with (precious) metals offer? And what are the differences between electroplating and physical vapor deposition?

If you give us a few minutes of your time, we will provide you with the answers to these questions in two videos.



Opening Suzhou:
mds.umicore.com/ussm-foundation



Videos:
mds.umicore.com



EcoVadis once again confirms our commitment to corporate social responsibility

In 2024, Umicore maintained its position as one of the world's leading companies in the EcoVadis social responsibility assessment, with an almost unchanged overall score of 73/100. Despite the increasing demands in the assessment categories, Umicore remains in the top 5% of companies assessed, a remarkable achievement for us given that 130,000 companies are now assessed by EcoVadis, 30,000 more than the previous year.

Help instead of gifts

The many crises in the world, as well as fates in our immediate environment, require rapid action. For this reason, we decided years ago to increase our donations for charitable purposes or targeted assistance in emergency situations. In 2024, we are able to provide well over €30,000 for relevant projects: for example, the German Red Cross (flood relief in Turkey), the local knowledge workshop Gmuender Eule and the Ronald McDonald House at the Heart Center in Munich were supported.

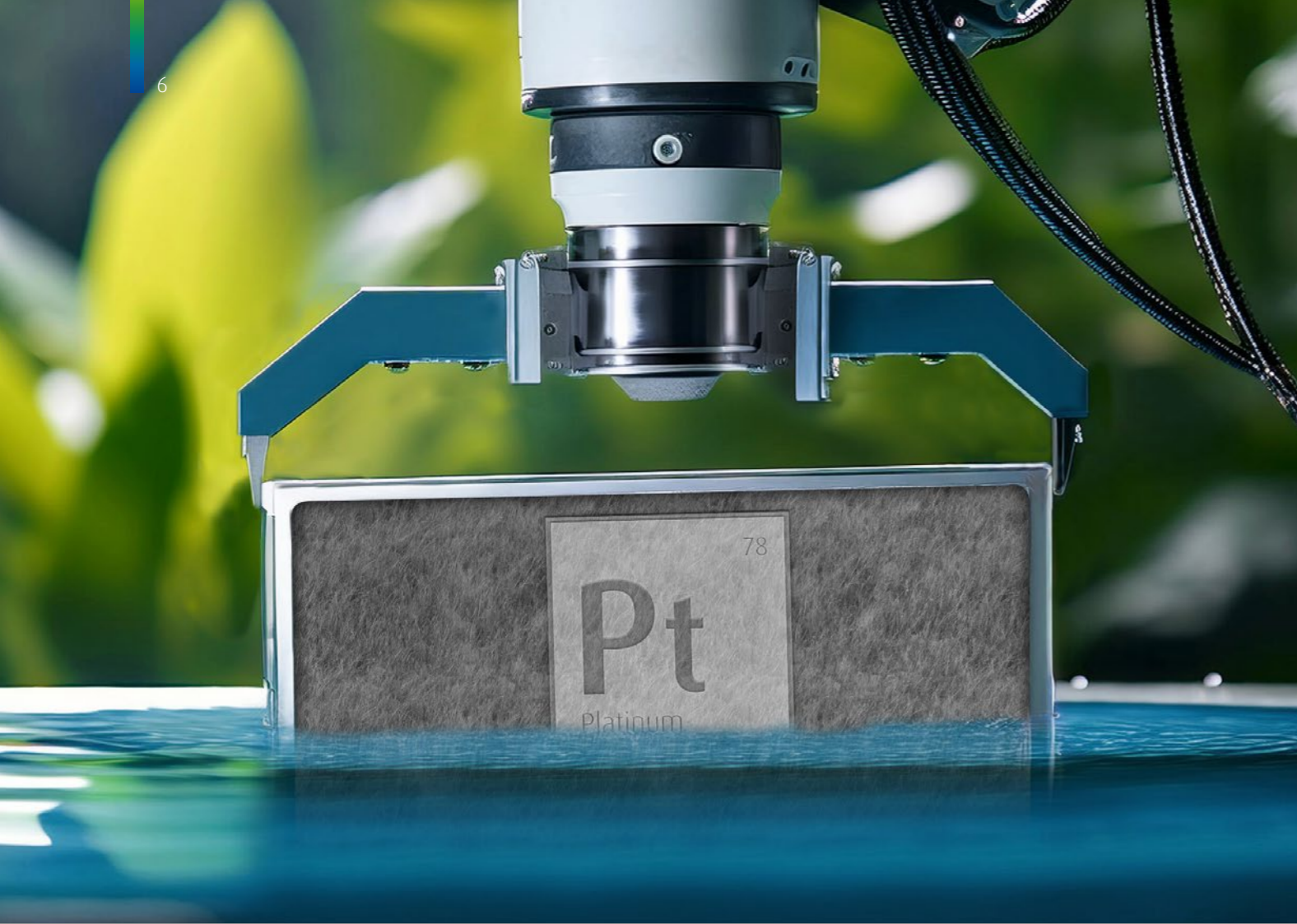


EcoVadis:
mds.umicore.com/ecovadis-2024-en



Donations:
mds.umicore.com/donations





Environmentally friendly coating process for PEM electrolyzer titanium components.

Pioneering platinum coating of PEM electrolyzer titanium components

Hydrogen is considered a promising energy source for the future

In view of current technological developments and the urgency of reducing CO₂ emissions, water electrolysis appears to be the most feasible and advantageous process for producing hydrogen at present. Among the various electrolyzer technologies, PEM electrolysis currently appears to be the most suitable for widespread market introduction.

Electrolyzers as key components

A PEM (Proton Exchange Membrane) electrolyzer is a complex system and includes several key components: Membrane Electrode Assembly (MEA), Porous Transport Layers (PTL), Bi-Polar Plates (BPL).

Titanium as the undisputed base material

Titanium is the preferred material for PEM electrolyzers over stainless steel due to its excellent oxidation and corrosion resistance, suitability for low pH values, low density and high mechanical stability. These properties ensure a long service life and reduce the overall weight of the components.

Platinum coatings significantly improve performance

Even a thin layer of platinum on titanium BPL and PTL significantly improves the performance and lifespan of the electrolyzer. Platinum offers superior electrical potential for PTL and acts as a catalyst, increasing the efficiency of electrochemical reactions. Platinum also reduces ohmic resistance and improves overall performance. In addition, corrosion and oxidation resistance are increased.

Safe platinum coating for the requirements of modern PEM electrolyzers

We are able to deposit platinum on titanium components for PEM electrolyzers in a way that is harmless to humans and the environment. Thanks to the optimal layer thickness distribution, we can offer our customers high-quality yet economically attractive solutions.



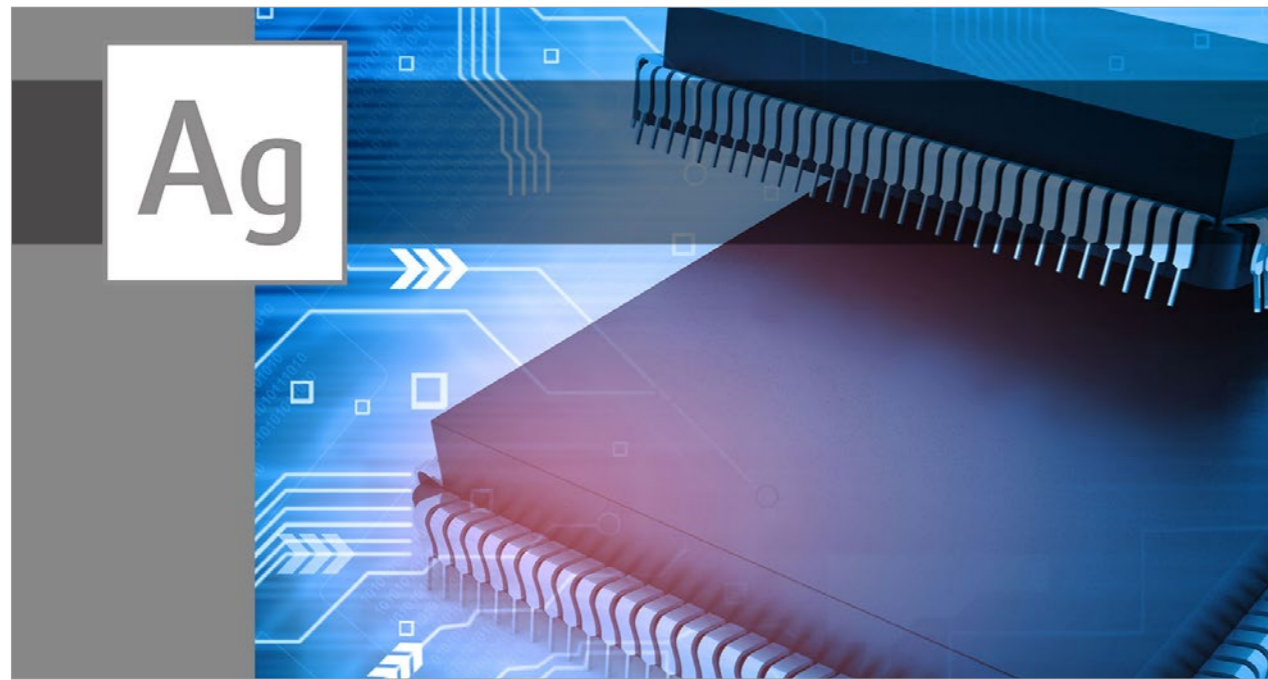
Umicore has set up an electroplating center in Schwaebisch Gmuend to plate a wide variety of components in a customer-oriented and sustainable manner.



Detailed information at:
mds.umicore.com/platuna-pem-electrolyzer



Environmentally friendly silver coating paves the way for sustainable production



We offer the complete package for environmentally friendly silver processes.

Sustainable alternatives to cyanide-based processes

Environmentally friendly silver processes are an attractive alternative to conventional methods. They enable the deposition of silver layers without the use of toxic cyanides, which significantly reduces the safety risk for personnel and the environment.

In addition, many countries have strict regulations governing the use and disposal of cyanides. As a result, large production facilities in particular are coming up against restriction limits.



Detailed information at:
mds.umicore.com/sustainable-silver



Indium electrolytes for press-fit technology

The high-speed processes Indium 9100 (acidic) and 9200 (alkaline) produce pure, ductile indium coatings that are ideal for reflow, soldering and press-fit applications.

Indium 9100

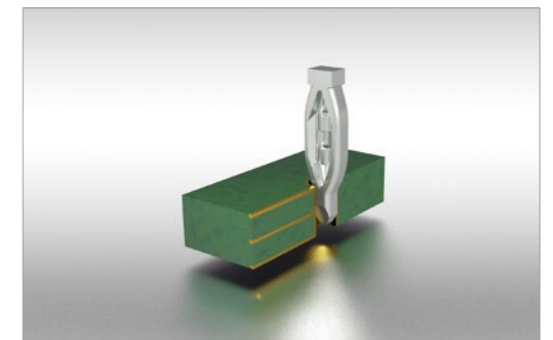
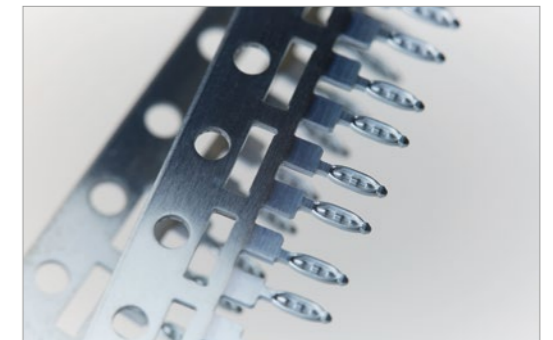
Indium 9100 is an acidic electrolyte that has been specially developed for high-speed systems. The layers are very well suited for soldering and reflow, and are ideal for press-fit technology and for plating electronic parts. The process is characterized by high stability and low whisker formation.

Indium 9200

Indium 9200 is an alkaline electrolyte that provides highly pure and ductile indium layers. The electrolyte is characterized by easy maintenance, low additive consumption and excellent layer thickness distribution.

The press-fit technique is an advanced solution for creating solderless electrical contacts by means of mechanical pressing.

Photos: Possehl-Electronics-pretPin®



Detailed information at:
mds.umicore.com/indium-en





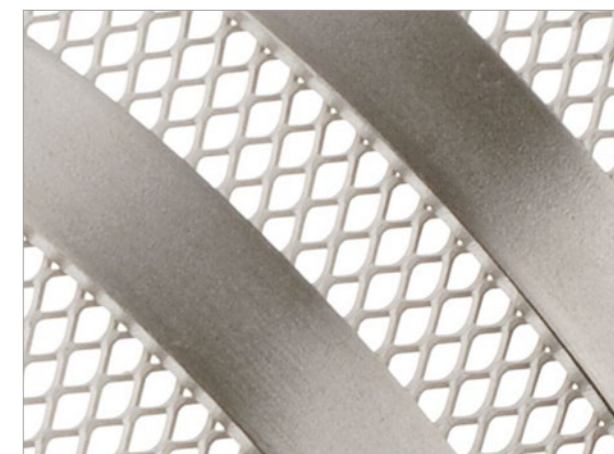
The era of lead anodes is coming to an end with the new EU directive

Time is running out for lead anodes - EU sets strict limits

The new EU directives will further reduce the use of lead anodes. The limits for occupational exposure to lead and its inorganic compounds in the workplace have been reduced to one-fifth of the previously permissible levels. This historic step by the European Union will improve working conditions and reduce environmental pollution.

PLATINODE® - Sustainable, profitable and without regulation

Our platinized anodes enable you to run a lead-free plating process that sets new standards for health and safety in your organization. At the same time, you benefit from outstanding plating quality, lower energy and maintenance costs, and, in the medium term, lower procurement costs.



Thanks to the platinum functional layer, our dimensionally stable electrodes not only have high ductility and the highest purity, but also excellent adhesion.

Platinised anodes are superior to lead anodes in all respects

Our platinised anodes enable you to use a lead-free coating process that sets new standards for health and safety in your company. This benefits not only the employees, but also the company. For example, the costs of monitoring lead exposure in the workplace, medical monitoring of staff and the purchase and maintenance of special protective equipment are eliminated.

PLATINODE® also offers a number of other advantages. In terms of quality, you benefit from an outstanding coating quality and, in terms of external presentation, from a significantly more ecological

reputation - not only through a lead-free production process, but also through lower energy requirements and thus a corresponding reduction in CO₂.

PLATINODE® also offers a whole range of economic benefits: Eliminated disposal costs, lower energy, maintenance and production downtime costs - and, in the medium term, lower procurement costs thanks to the possibility of replating the customised anode design.



Detailed informationen at:
mds.umicore.com/time-for-platinode



PLATINODE® EGL: Anodes for galvanizing lines

MMO and platinized titanium anodes offer long-lasting, efficient and environmentally friendly solutions for galvanizing lines. Compared to the previously frequently used soluble anodes (e.g. zinc anodes), both types of anodes ensure an even current distribution, are low-maintenance and cost-efficient in the long term. They produce less waste and no material consumption, which also makes them the optimal choice from an environmental point of view for modern galvanizing processes.

In galvanizing lines, insoluble anodes such as our MMO anodes or platinized titanium anodes ensure that the zinc is evenly deposited on the strips.



Detailed informationen at:
mds.umicore.com/platinode-egl-en



Copper additives for the semiconductor industry attract media attention

The semiconductor industry is constantly looking for new ways to improve the performance of its products. An article on Global Spec now deals with our product portfolio for this segment. In particular with our copper additives of the IntraCu® series, which bring advantages in terms of the performance of ICs, among other things.

Stressless copper for superior semiconductor performance

Global Spec (January 24, 2024)

In just 3 minutes, get a clear overview of how our IntraCu® series helps take advanced packaging to the next level. The article covers the following topics in more detail:

- **Stress-free copper as a "gamechanger"**
Additives provide material properties and crystal structures that overcome typical limitations in semiconductor production.
- **IC reliability as the main advantage**
Reduced production waste and significantly longer durability of ICs are highlighted as the main advantages.
- **Compatibility with existing processes**
Production of stress-free copper requires no additional process steps or equipment and is compatible with existing equipment.
- **Overview of the semiconductor portfolio**
Copper(II) oxide for dry metal replenishment (DMR), anode/cathode materials for ECD systems and sputtering and vaporization materials (TFP) round off the offering for this segment.



Detailed informationen at:
mds.umicore.com/globalspec-en





AURUNA® – the perfect symbiosis of gold and iron reflects the yin-yang philosophy: two different elements create a harmonious and functional whole.

Cobalt- and nickel-free hard gilding in unique quality

The yin-yang symbolism, which describes the balance and harmony between two opposing but complementary forces, can be wonderfully applied to our new AURUNA® gold-iron alloys.

They combine the precious, soft gold and the non-precious, hard iron to form a perfect, complementary final layer. The combination of both elements is aesthetic, functional, robust and, above all, more sustainable and therefore more economical than the previously predominant hard gold compounds with cobalt or nickel.



Gold and iron combine to form a perfect layer



Previous hard gold alloys confront EHS teams with major challenges in procurement and production

Common hard gold alloys contain cobalt or nickel. This means that they are increasingly challenging for EHS (Environmental, Health, and Safety) teams. The sourcing and processing of cobalt and nickel involves significant risks and ethical issues - resulting in increased regulation. However, the use of hard gold alloys is unavoidable for a wide range of decorative applications and for many technical achievements.

High-quality, unrivaled and yet sustainable hard gold coatings

Our customers confirm that our previous hard gold processes based on critical alloying partners are unrivaled in terms of quality and ease of use. The new alloying partner iron makes the negative aspects of cobalt or nickel a thing of the past. Iron is conflict-free and, in contrast to nickel and cobalt, is available in large quantities and therefore cost-effectively due to its ever-increasing use for battery materials in e-mobility. In addition, iron does not require expensive and elaborate safety standards for processing, as is the case with nickel and cobalt.

The handling and layer properties have not changed despite the changeover. AURUNA® electrolytes are therefore still the best choice for all hard gold applications and can be used 1:1 like our previous products.

Detailed informationen at:
mds.umicore.com/yin-yang-en



Nexyclus™

100% recycled gold, silver, platinum, palladium and rhodium

Umicore launches the world's widest range of fully recycled precious metals

Thanks to the Umicore Group's leading global position in metal recycling, we can now offer you the world's most comprehensive range of fully recycled precious metals under the brand name Nexyclus™. This not only helps us to counteract the global scarcity of resources, particularly for platinum group metals (PGMs), but above all enables you to plate precious metals responsibly - to support your sustainability goals.

With Nexyclus™, we guarantee you 100% high-quality recycled precious metals from reliable sources that meet our strict guidelines for responsible procurement. You have the choice between various offers that differ in terms of Chain of Custody (CoC) certificates and the process flow. Of course, all our Nexyclus™ certificates are verified by independent auditors*.



Validity of the certificate

Once the certificate has been issued, it no longer has an expiry date, as the metal can be used for short-term applications or stored for long-term investment purposes.



Quality of the metals

Nexyclus™ recycled metals meet the same high-quality technical specifications as those for refined primary metal.



Use of the certificate

The Umicore Nexyclus™ Certificate is only valid for use by the direct beneficiary purchaser of the metal units. It may not be transferred to a downstream purchaser without written authorization.



Detailed informationen at:
mds.umicore.com/nexyclus-plating



Events 2025



We look forward to seeing you again at trade fairs and conferences around the world in 2025.



In 2025, we look forward to welcoming our customers and prospective clients from around the world at trade fairs, symposia and conferences. We are currently working hard to ensure that we are ready to make our usual appearance.

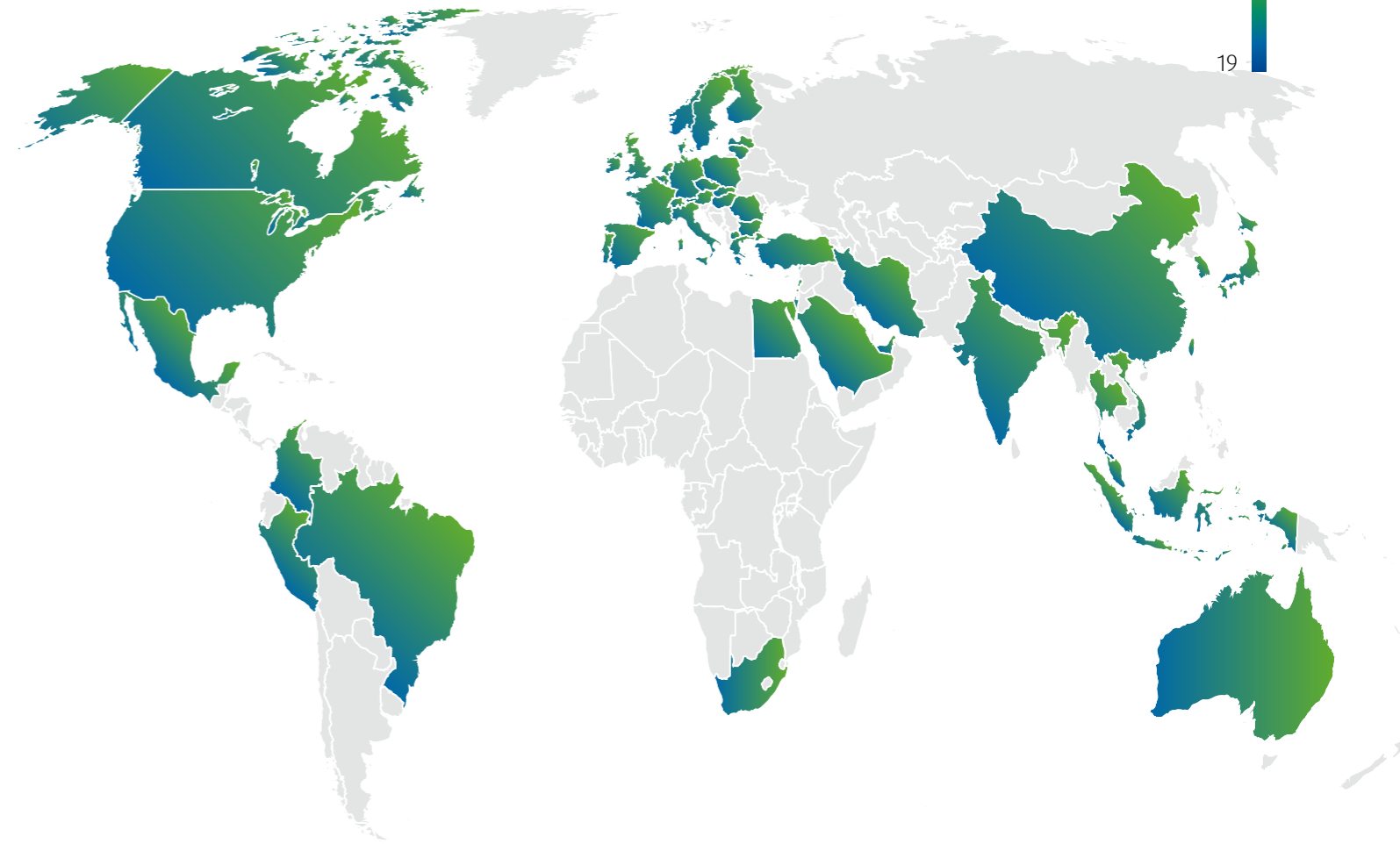
To stay up to date and find out about personal meetings, we recommend regularly visiting our event website. Or, for even more convenience, subscribe to our newsletter.



Events:
mds.umicore.com/events



Newsletter:
mds.umicore.com/newsletter



Competent contact persons in over 60 countries worldwide

Representatives worldwide

Our experts are not only based at our headquarters in Germany, but also in just over 60 countries worldwide.

This global sales network of selected partners means that you can purchase our products and services locally, without having to travel. Take advantage of short distances and communication in your national language.



All representatives worldwide:
mds.umicore.com/representatives



Passion for
perfect surfaces

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