

General Metal Finishing

Welcome to our world of surface finishing

Rafal Janowicz | Deputy Business Director | GMF & ELWAFEM Business Manager

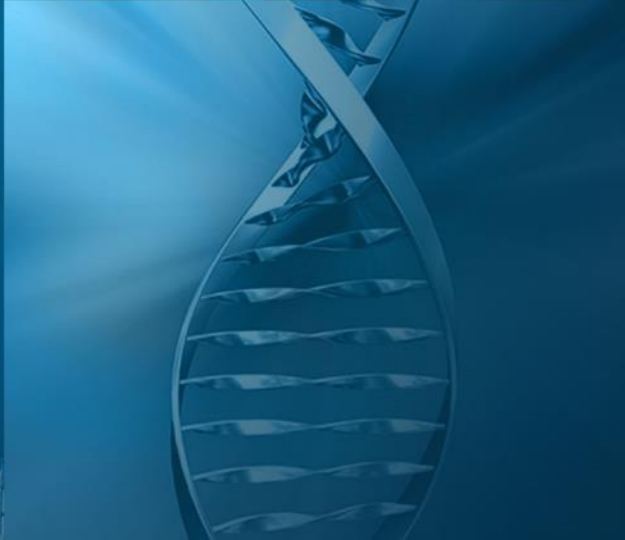
Atotech GMF Seminar Poland 2023

September 19 – 21, 2023
Janów Podlaski Castle, Poland



Corporate position and strategy

Introduction



Delivering on our mission day-to-day

➤ We provide the **most advanced technical solutions** for the world's surface-finishing industries, through a combination of **innovative chemistry and world-class equipment**.

➤ We thrive and succeed based on **superior customer satisfaction and best-in-class technical support**.

➤ We are **committed to innovation and will adapt** to meet the needs of our customers and employees worldwide.

Atotech, a global, leading brand in surface-finishing solutions

Well over **100** years at the forefront of the chemical and electroplating industry

\$1.4bn in sales contribution to MKS' \$4.45bn in total pro-forma revenue*

Over **2,000** total patents in our Atotech portfolio as of today

Present in more than **40** countries with Atotech products, serving over **8,000** customers worldwide

52% of MKS' R&D projects related to Atotech products are devoted to sustainable goals

3 regional HQ
15 TechCenters
17 production sites

4,000 experts of MKS' 10,000 employees are dedicated to Atotech products

230 kt/year production capacity

As of December 2022; *pro-forma revenue consists of revenue for 2022 for MKS and Atotech

We deliver chemistry, equipment, and service through a comprehensive systems-and-solutions approach. Our core competencies include:



Electroplating and surface-modification
chemistry



Software development



Understanding of surface-finishing
supply chains



Global technical plating **support** with
a systems and environmental approach

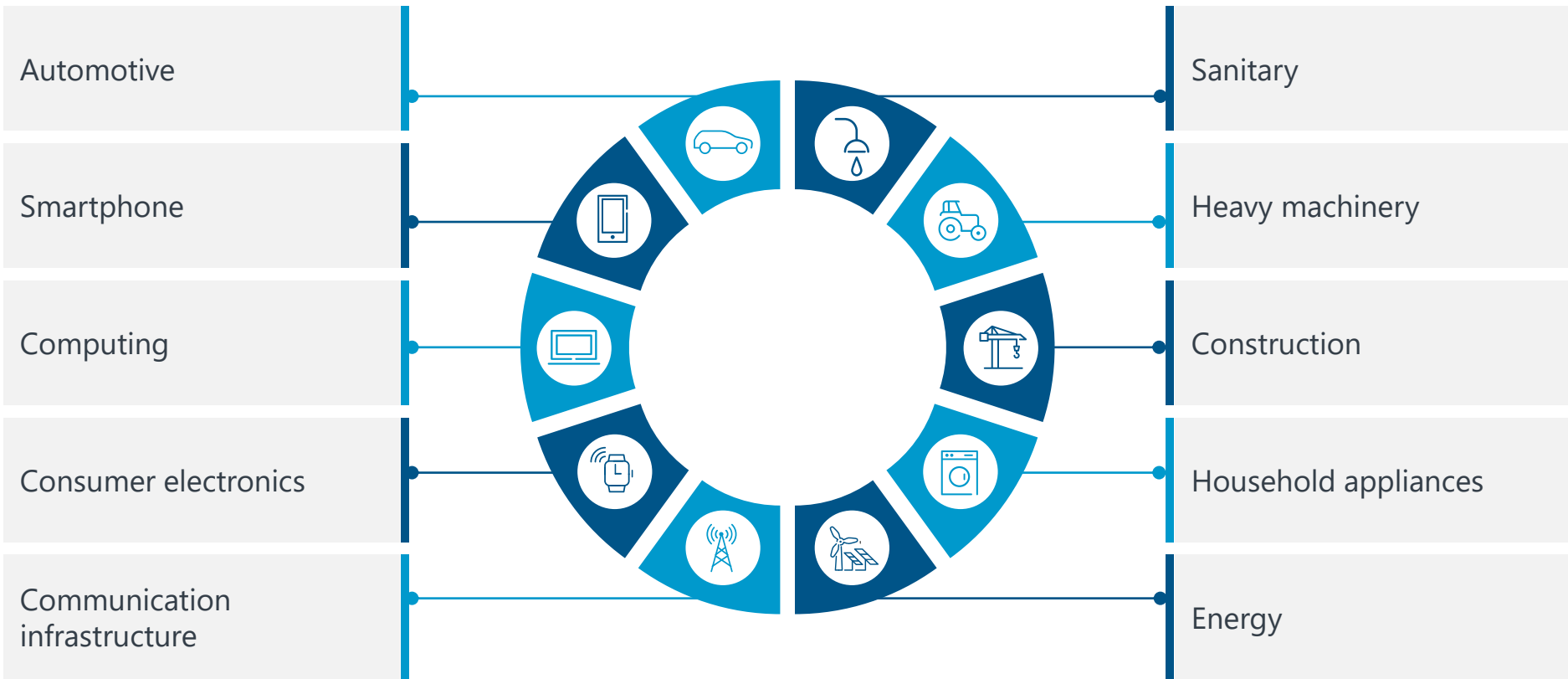


Electroplating **equipment**



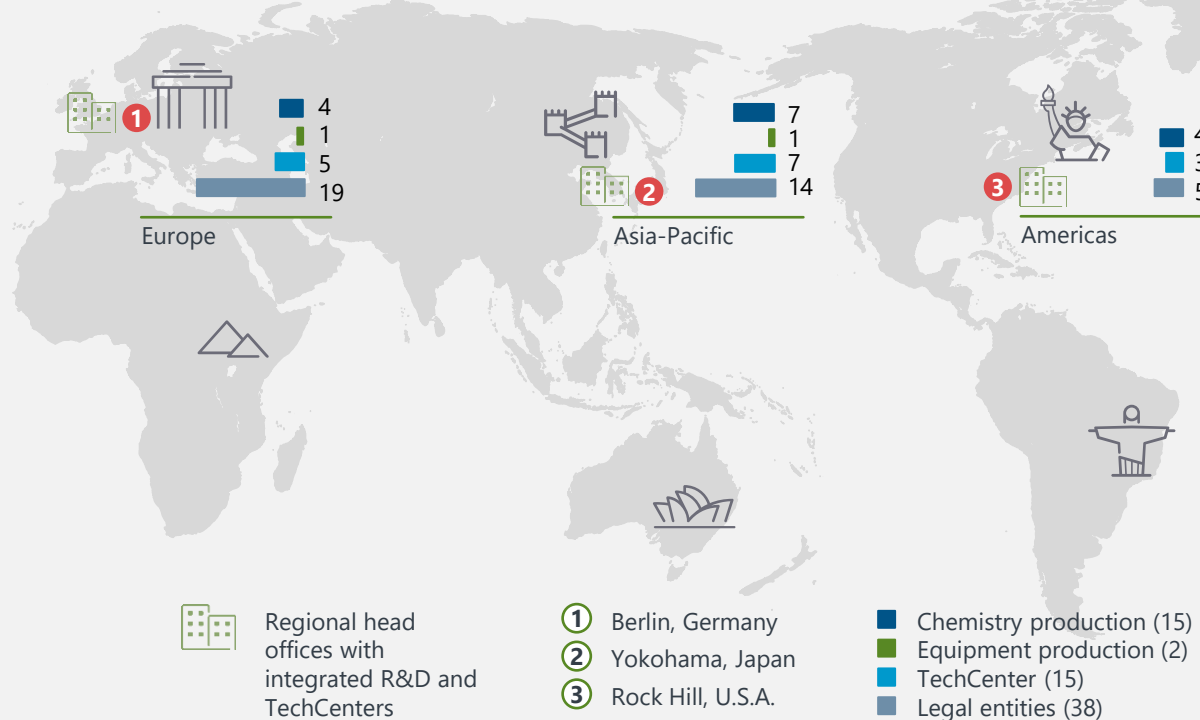
Compound formulation and
analytics

We serve multiple end markets and industries



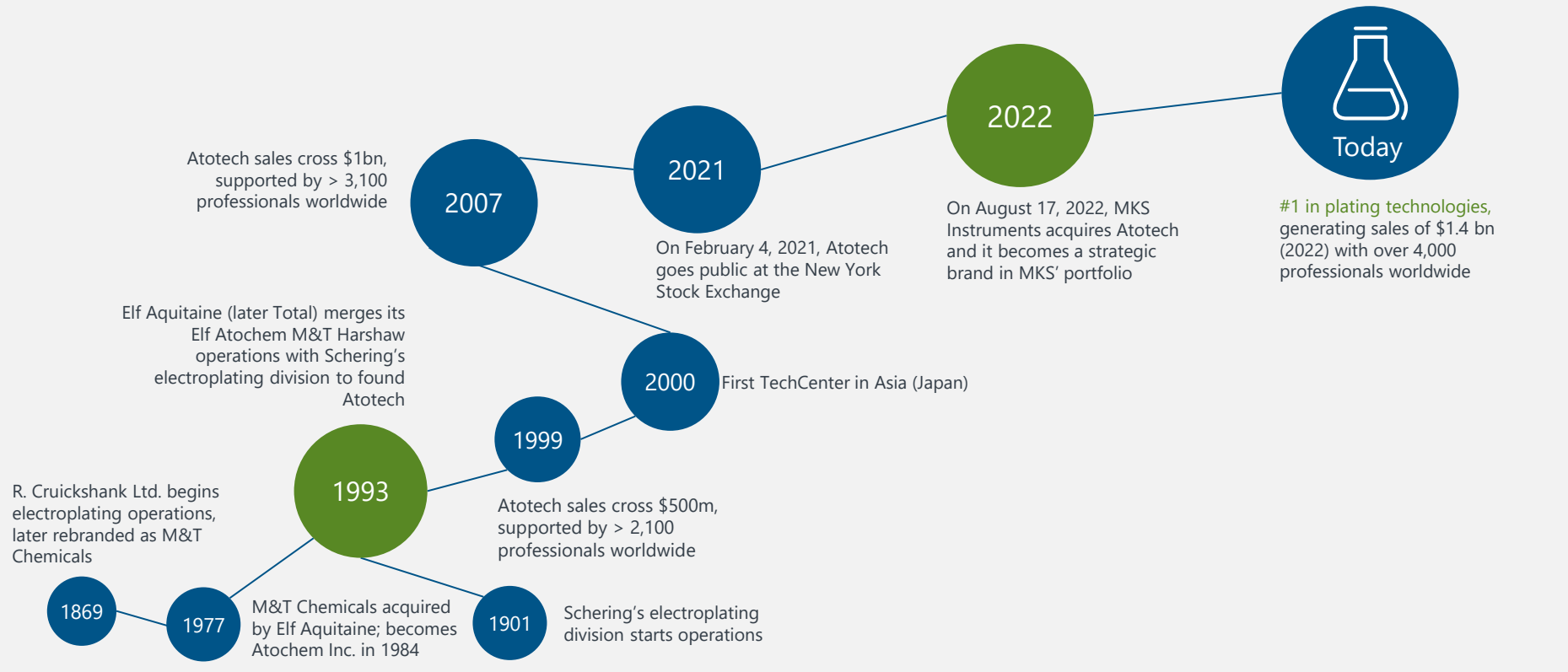
Our global presence

Sales and service in more than 40 countries enable us to provide the most efficient customer support worldwide.



as of April 2022

Atotech's journey so far



Atotech, an MKS brand | Overview of MKS Instruments, Inc.



¹ Internal Company estimate

² Product categories where TechInsights and/or MKS estimate MKS is #1 or #2 in segment share

MKS: Applying broad domain expertise across attractive end markets



SEMICONDUCTOR

39%

of Total Revenue in Q1 2023

- Deposition and Etch
- Lithography
- Metrology and Inspection
- Wet Clean
- Packaging

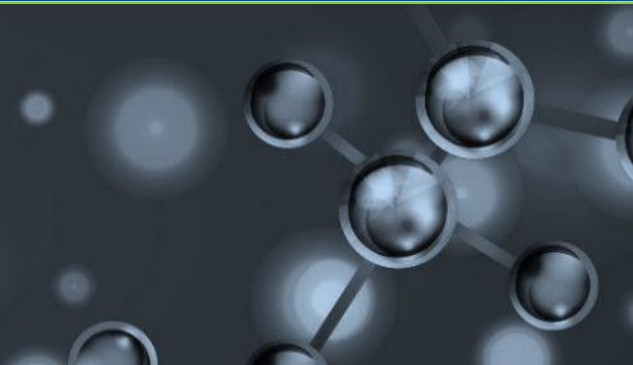


ADVANCED ELECTRONICS

28%

of Total Revenue in Q1 2023

- PCB Via Drilling
- PCB and Packaged Substrate Surface Treatment, Metallization, Plating and Final Finishing
- Solar and Display Processing
- Electronic Component Manufacturing



SPECIALTY INDUSTRIAL

33%

of Total Revenue in Q1 2023

- General Metal Finishing
- Industrial
- Life & Health Sciences
- Research & Defense

← EXTREME PRECISION MANUFACTURING

LEVERAGING DOMAIN EXPERTISE →

Our two core businesses



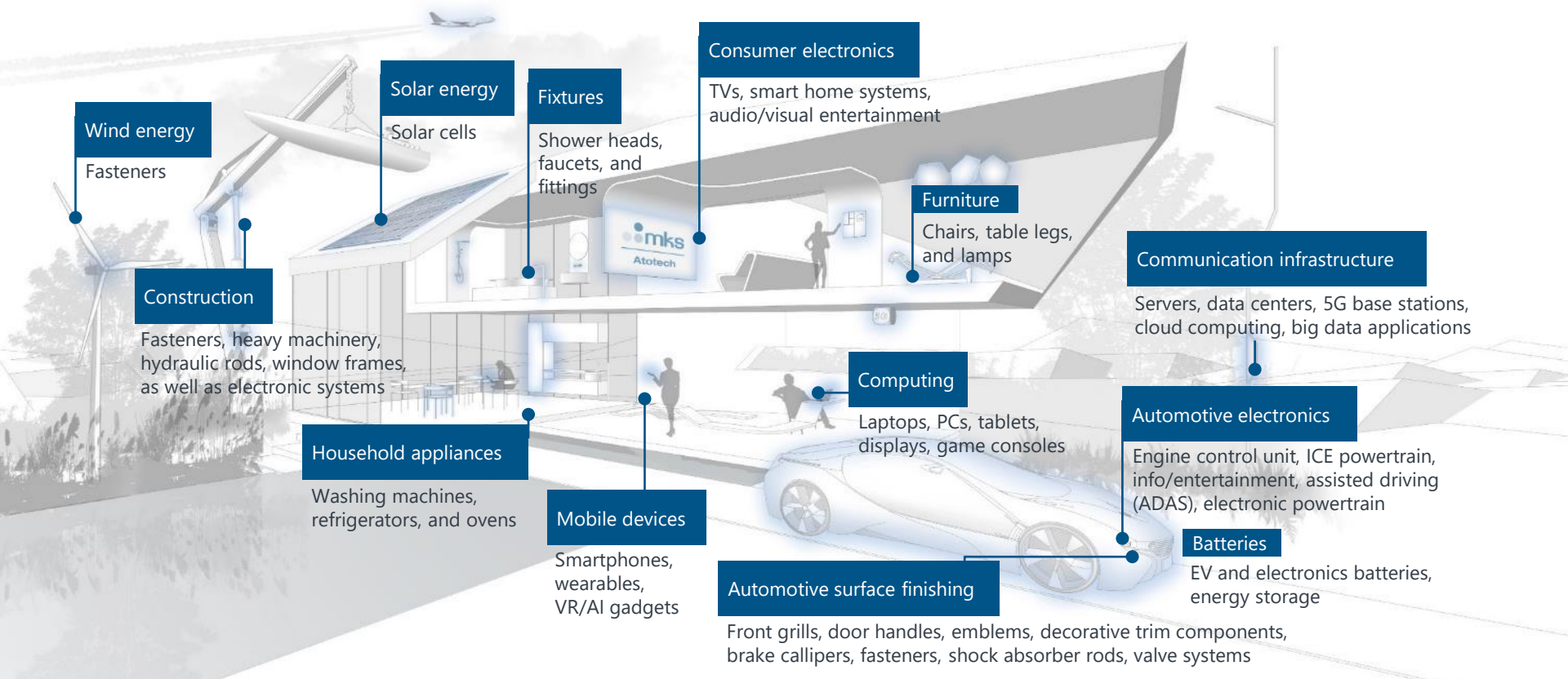
Electronics



General Metal Finishing (GMF)

We add value with innovation

Here is a look at some of the end-markets and products that utilize our technology



Our strategy



Best local service

TechCenters with production-sized lines for product qualification and training



Leading technologies

Meeting the industries' current and future requirements



Production know-how

Chemicals, systems and service solutions for the surface-finishing and electronics industry



Sustainable solutions

Sustainable systems and chemical processes to reduce environmental impact

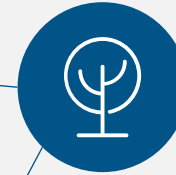


Our top priorities

- We create a safe working environment for our staff and customers
- We pay close attention to the smallest details in order to avoid any unforeseen incidents



Safety



Sustainability



Compliance

- We aim to find the balance between industrial innovation, sustainability and economic viability
- We develop industry-leading solutions to help customers conserve resources and reduce waste
- Our reputation is built on integrity and a comprehensive code of conduct
- We have stringent rules and a zero-tolerance policy when it comes to compliance and corporate governance

We are committed to operating our business responsibly

“

“At MKS, our goal is to develop products that enable our customers to be more successful, our planet more sustainable, and our communities safer and more productive.

Our commitment to operating our business in an environmentally and socially responsible manner, in tandem with our employees, customers, suppliers and communities, remains unwavering.”



John T.C. Lee
President and CEO
MKS

Our sustainability strategy and roadmap

Our strategic levers

1 Drive Sustainable Operations

We will aim to reduce the impact of our own products across CO2 emissions, water, waste and hazardous chemistry.

2 Innovate for sustainability

Our most important contribution is to innovate for sustainability and solve the most pressing sustainability challenges in our industry.

3 Partner for change

We recognize that driving sustainability in our industry needs deep collaboration across the value chain. We aspire to be your partner for change.

2023 – 2025 Sustainability roadmap



Our commitment to sustainability is recognized externally



ESG Risk score: Low (11.2)
Significantly lower compared
with peers and competition



We have adopted the industry
standard Responsible Business
Alliance ("RBA") Code of Conduct
as its Supplier Code of Conduct



Score: A
Above average in the
industry



We will set science-based
targets for emissions
reductions in 2023*



Score: 42
Continuously improving
our performance and
disclosures

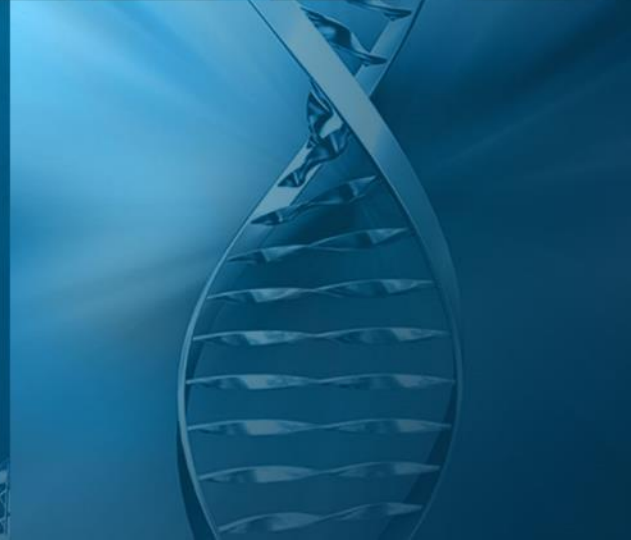


We will integrate climate risks
management into our
Enterprise Risk management
and set-up strong governance

* To be formalized in H1 2023

General Metal Finishing

Quick facts



Driving innovation through trust and collaboration



- Chemistry
- Plating equipment
- Auxiliary equipment
- Global service
- Software
- Decorative coatings / plating on plastics
- Corrosion protection coatings
- Wear resistant coatings
- Paint support technologies

Multiple tier suppliers and OEMs (examples)



End markets

- Automotive
- Construction
- Heavy machinery
- Sanitary ware
- White goods
- Energy
- Consumer electronics
- Jewelry, fashion

We are a total solutions provider - with proven track records of successful collaboration projects.

Raising technology standards for decades

Plating on plastics & decorative coatings

1992	TriChrome® Plus: Cr(VI)-free decorative chrome process
1997	Futuron®: First direct metallization process in the market
2005	Satilume® LongLife: Regeneration system for sating nickel processes significantly extending bath lives
2007	TriChrome® Plus: Cr(VI)-free decorative chrome process for automotive
2010	Adhemax®: State-of-the-art pretreatment for ABS and PC/ABS for automotive applications
2012	TriChrome® Shadow and Graphite: Cr(VI)-free decorative chrome process for automotive in unique dark shades NeoLink®: State-of-the-art direct metallization process
2013	Pd online controller: Tight control of Pd conc in activator reducing Pd consumption
2015	Trichrome® Ice: Cr(VI)-free decorative chrome process for automotive Helix®: Recovery system for Ni from rinse waters Cupracid® PV: Acid copper metallization process for photovoltaics
2022	Covertron®: First Cr-free plastics pretreatment process



Wear resistant coatings

1995	DynaChrome®: Unique encapsulated hard chrome plating system for piston rods
1999	EDEN®: Unique long life electroless nickel process system
2017	BluCr®: First Cr(VI)-free hard chrome plating process in the market
2021	Fumalock®: PFAS-free mist suppressant for hard chrome plating
2021	Nichem® MP 75: Low temperature electroless nickel process Nichem® ONE MP: Single additive electroless nickel process



Raising technology standards for decades

Corrosion protection coatings

2015 **Zinni® 220:** State-of-the-art acid ZnNi for brake components for higher productivity
Tridur® DB: New generation high performance Co-free blue passivate for zinc nickel
Zintek® 300 HP: First black high-performance base coat high corrosion performance base coat

2016 **Zintek® Top XT:** Water-based top coat with excellent corrosion protection

2017 **Zintek® 200:** Premium silver base coat for outstanding corrosion protection, adhesion and coverage properties
Zintek® ONE HP: Inorganic silver zinc flake one layer base coat

2018 **Zinni® AL 450:** Alkaline ZnNi combining fast deposition rate and excellent LCD throw

2020 **CMA + closed loop:** Sustainable system for CN avoidance and wastewater reduction/elimination (barrel application)

2022 **XLINK 800:** Cross linker used with organic top coats to improve the performance ; CO₂ footprint, less material (spray applications)

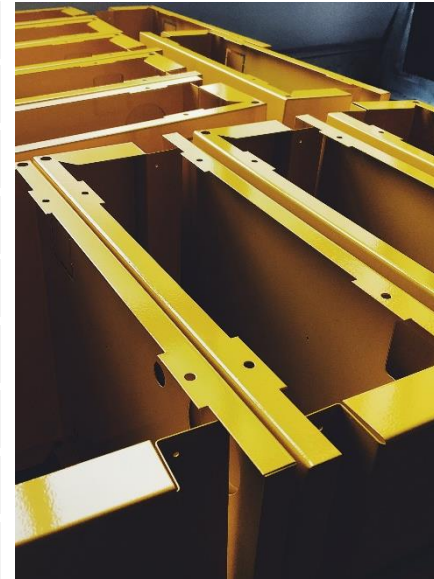
2023 **CMA + closed loop:** Sustainable system for CN avoidance and wastewater reduction/elimination (rack application)



Raising technology standards for decades

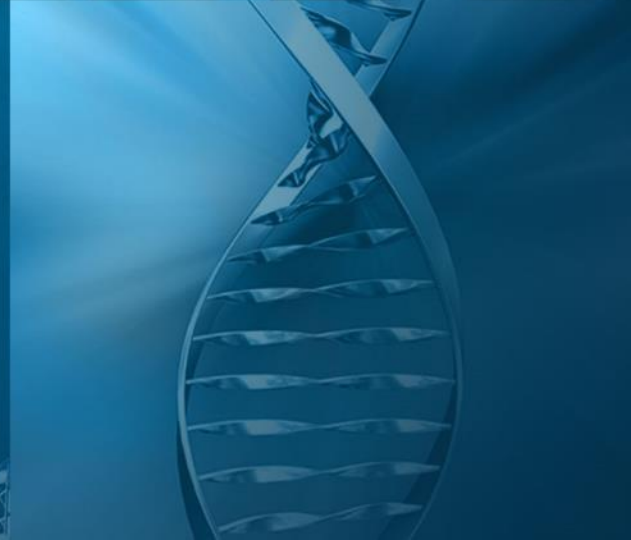
Paint support technologies

2016	UniPrep® D 315 LL: Long life, low temperature alkaline cleaners with superior cleaning performance at low operating temperatures
2017	Master Remover® 7000: Sustainable, low VOC, HAP-free process for paint removal of powder coatings
2019	KleerAid EZ Treat 2.0: simplified, cost effective and low maintenance paint overspray treatment
2020	UniPrep® ACS 100: Near neutral pH weld and laser descaler for spray applications
2020	Master Remover® ESPRIT and ESPRIT C: pre-assembled sustainable paint removal equipment for integrated systems approach, and its compact, lower cost version
	UniPrep® ISOtect: Specialized oil elimination equipment supporting UniPrep® long life cleaners
	Interlox® 377: Cr(III) conversion coating for greatly improved corrosion protection in pre-paint and passivation applications
2022	UniCoat® CTR: Zirconium-based cleaner coater for short system pretreatment applications
	UniPrep® ACS 1000P: Advanced weld and laser descaling process with enhanced ability for organic contaminant removal in single process step



Our solutions

Product portfolio and markets



General Metal Finishing

Product portfolio

Decorative coatings



Pretreatment, plating on plastics, copper, nickel, chrome, alloys, precious metal plating

Paint support technologies



Paint pretreatment (cleaners/degreasers, descalers, zirconium pretreatments, sealers, adhesion promoters)
Paint stripping (ferrous and light-metal paint removal)
Paint overspray treatment (water-borne, solvent-borne and mixed paint systems)

Corrosion protection coatings



Electroplating: Pretreatment, zinc and zinc alloys, post-treatment (passivates, lubricated/non-lubricated sealers)
Zinc flake coatings: Pretreatment, base coats, lubricated/non-lubricated, organic/inorganic top coats, base layer application for subsequent e-coat paint

Cleaner, stripper, pretreatment



Soak and electro cleaner, pickling additives, acid cleaner, activators, strippers and aluminum pretreatment

Wear resistant coatings



Hard chrome: Hard-chrome coatings, including a trivalent chromium alternative to hexavalent hard-chrome plating, fume suppressants, pre- and post-treatment
Electroless nickel: Pretreatment, electroless nickel, composite coatings, post-treatment

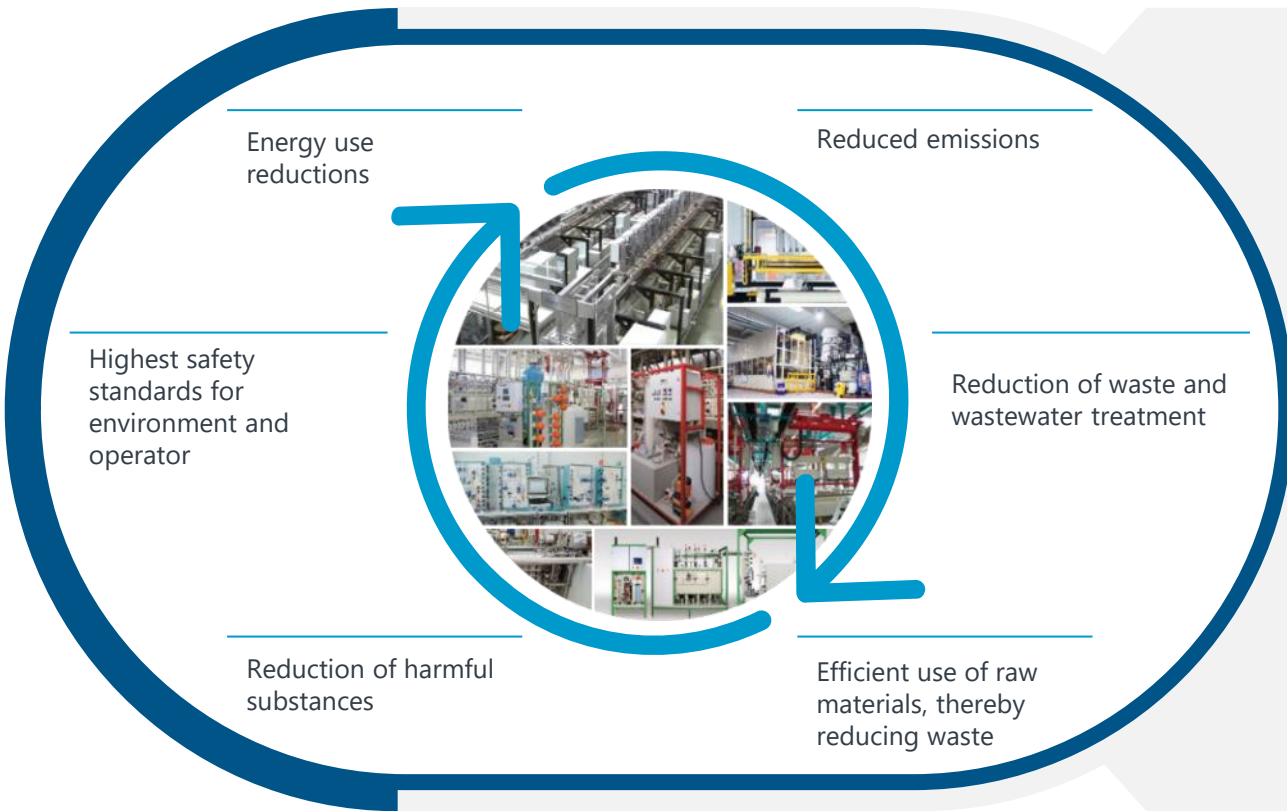
Production systems



Electroplating equipment (plating lines and auxiliary equipment) featuring a complete engineering package and perfectly matched concepts complementing GMF chemistry and services

Equipment technology

GMF plating lines and auxiliary equipment: Maximized efficiency with minimized environmental impact



Comprehensive systems and solutions approach combines chemistry, equipment, and service



Optimal results due to chemistry and equipment designed for each other



World-class service supports customers across entire plating process



Global network of experts to provide fast solutions on future customer and production needs

Equipment technology

GMF plating lines and auxiliary equipment: Maximized efficiency with minimized environmental impact

DynaPlus®

Highly efficient customized plating lines

> 350 DynaPlus®, with some of them in operation for more than 50 years



DynaChrome®

Unique production system for plating of shock absorber rods

Since 1998, the system has been the first choice for leading shock absorber rod manufacturers worldwide



Auxiliary equipment

Reducing resource and chemical consumption and wastewater, extending bath life, improving plating quality while maximizing production efficiency

- Ion exchange technologies for Cr(III) passivates, electrolytic nickel, trivalent decorative chrome and hexavalent hard chrome plating electrolytes
- Metal recovery systems for electrolytic nickel
- Membrane anode technology for alkaline zinc nickel
- Regeneration systems for acid zinc and alkaline zinc nickel electrolytes
- Electrodialysis system for electroless nickel
- Integrated production system for hard chrome plating
- Automated online analysis systems



Software and digital solutions

Complete ecosystem of solutions and service



Equipment

NEW



Software
and digital
solutions



Chemistry and
process



Service

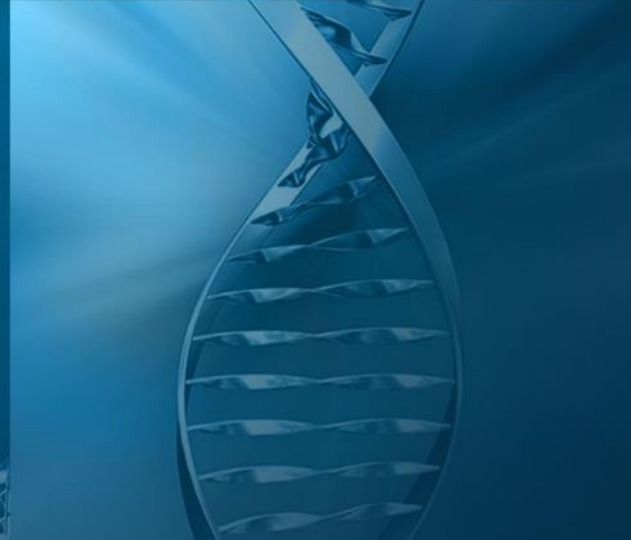


In 2020, we extended our internal competency to the development of **industrial software solutions and extend it to digital solutions based on IoT.**

We are the only major supplier to provide chemistry, equipment, software, and service in a comprehensive solutions-based package.

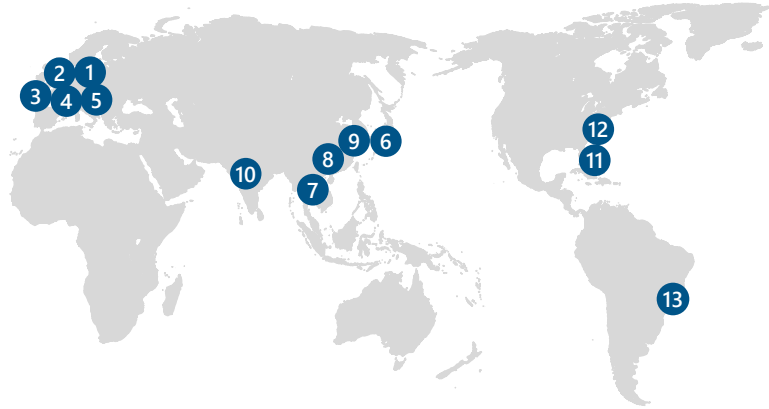
Unparalleled services

Industry leading
service network and
capabilities



Global TechCenters

Our industry leading support network



13 TechCenters worldwide dedicated to General Metal Finishing (2022)

- | | | | |
|----------------|----------------|-----------------|------------------------|
| 1 Berlin, DE | 2 Trebur, DE | 6 Yokohama, JP | 10 Manesar, IN |
| 3 Feucht, DE | 4 Milan, IT | 7 Guangzhou, CN | 11 Rock Hill, USA |
| 5 Jablonec, CZ | 8 Shanghai, CN | 9 Jangan, KR | 12 Burlington, CA |
| | | | 13 Taboao da Serra, BR |

Our global network enables

TechCenters:

- Qualification runs for customers and OEMs
- Pilot production for customers
- Material science and analytics investigations
- Prototype work
- Training for employees, customers, and OEMs
- Development testing
- Application work to reach production level
- Ongoing service after the sale
- Supplier qualification

On-site support:

- Provide training and support to increase efficiency
- Real-time troubleshooting to minimize downtime
- Proactive product development to anticipate and meet customers' needs

Inside our TechCenters

TechCenter Rock Hill
Deco/POP plating line



TechCenter Trebur
CRC plating line

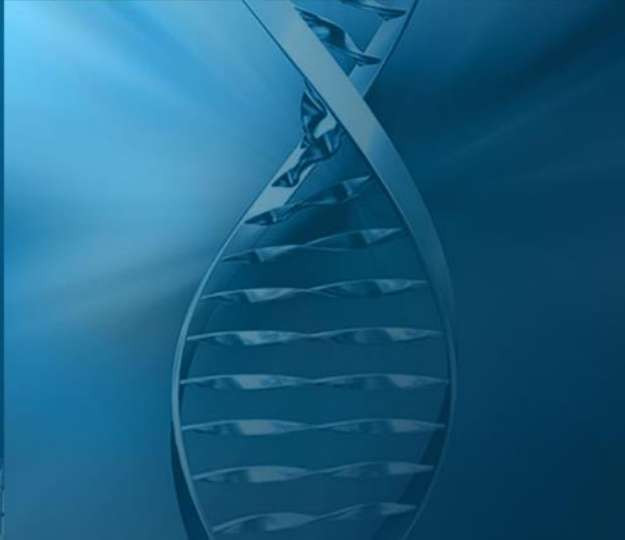


TechCenter Guangzhou
Deco/POP plating line



Sustainable solutions

Our contribution to a more sustainable plating industry



And our commitment to the industry remains strong



We have set a clear goal for ourselves: to be the leading supplier of sustainable plating and surface finishing systems

Our innovation focuses on key sustainability needs of our customers



Replacing harmful substances

Wherever possible, replacement of Pb, Ni, F, cyanide, Cr(VI), boric acid, NPE, NMP, Co, Cd, formaldehyde, PFAS



Pioneering green chemistry

We work intensively on developing green alternatives to the conventional processes and systems used in today's plating industries



Reduce resource consumption

Our systems and equipment are designed to use water, energy and raw materials with high efficiency, reusing and recycling wherever possible



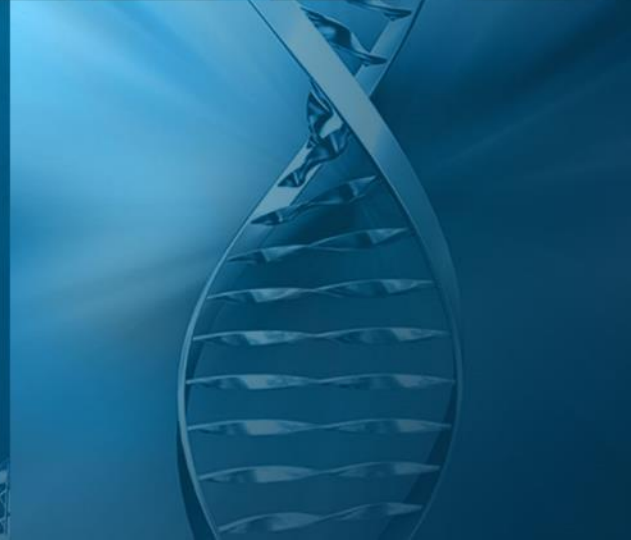
Improving circularity in our solutions

Our auxiliary equipment enables metal recovery, ion exchanges and electro dialysis for regeneration among other things



Automotive competence

A unique market
approach



Automotive competence

Surface finishing solutions for automotive applications



We have a thorough understanding of the automotive industries' needs and provide the process know-how making us the premier partner for the automotive industry providing the right finish for every requirement and application.



Automotive competence

Sustainable automotive solutions

Decorative coatings

Plastic pretreatment
Copper/nickel/chrome coatings

Wear resistant coatings

Functional chrome coatings
Electroless nickel coatings

Corrosion protection coatings

Zinc and zinc alloy coatings
Zinc flake coatings

Paint support technologies

Paint overspray treatment, pretreatment, stripping

Electronics

Wet chemicals and production technologies for printed circuit boards, semiconductors and functional electronics

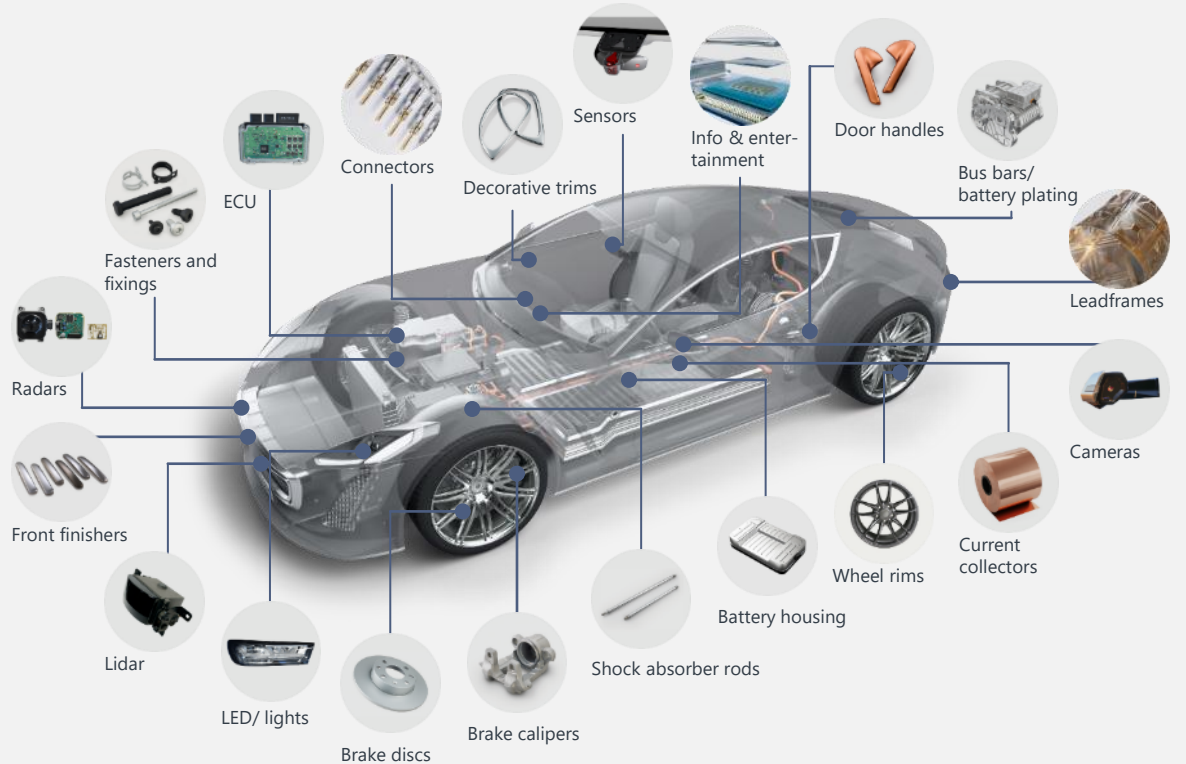
Plated components in combustion engine



Piston rods,
piston rings

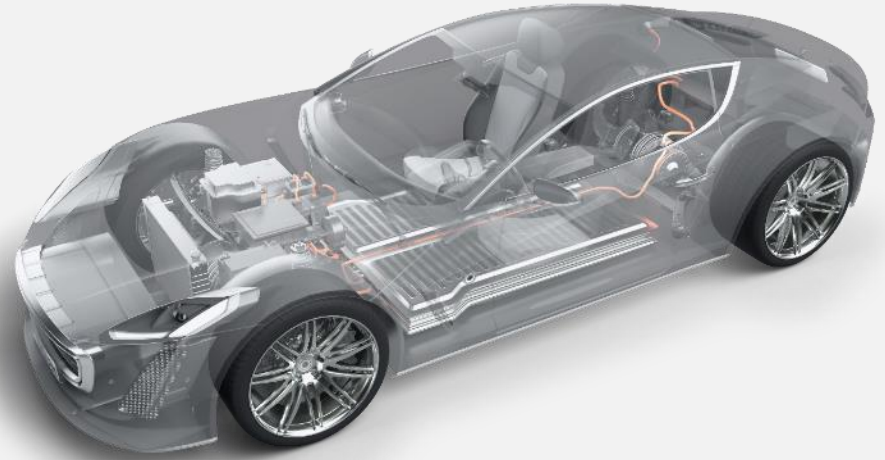


Fuel
rails



We already started to focus on sustainability decades ago

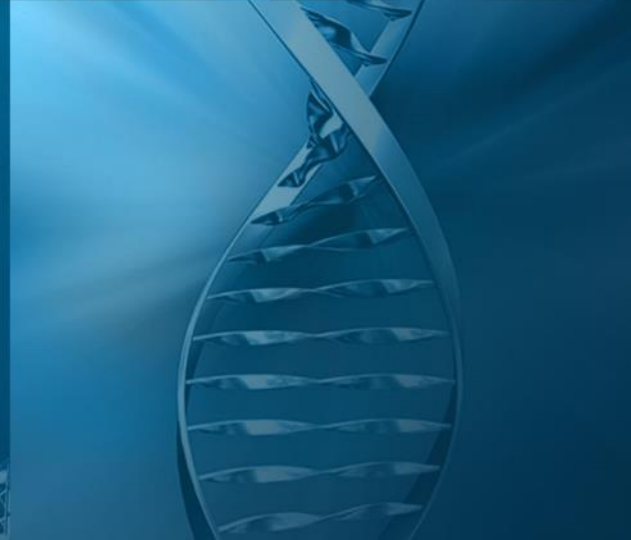
Our processes fulfill the requirements of the automotive industry and are approved by many OEMs.



Audi, Bentley, BAIC, BMW, CAT, CBI, Changan, Cupra, DAF, Daihatsu, Daimler Truck, Ducati, FAW, Ferrari, Ford, GAC, Geely, GM, Great Wall Motors, Harley-Davidson, Honda, Hyundai-Kia, Iveco, JLR, Mahindra, MAN, Maruti Suzuki, Mitsubishi, NIO, Nissan, Piaggio, Porsche, Renault, Renault Trucks, Rolls Royce, Scania, Seat, Skoda, Stellantis (FCA, PSA, FIAT, Maserati, Opel), SAIC, Tata, Tesla, Toyota, Volvo Cars, Volvo Trucks, VW, and many more

Learn more online: [Automotive approvals](#)

Summary



Leading surface finishing solutions

Today, we are the **partner of choice** for thousands electroplating and surface finishing components manufacturers worldwide.

We have been a **highly reliable and trusted global partner for more than 120 years** with a proven track record of long-term development and business partnerships.

We are the only company of its scale to provide a **total systems approach** combining chemical processes, plating equipment and service.

We understand and deliver the **complete surface finishing process** for best possible production results considering **performance and the environment**.



With our **expert plating technology service and sales teams** for chemistry and equipment, we can provide unparalleled service worldwide.

While meeting global demand for technologies and chemicals, we seek to contribute to a more **sustainable plating industry** through our products and solutions.

We are the **premier partner** for the automotive and many other industries providing the **right finish for every requirement**.

Thank you!

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