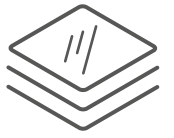


# Corrosion protection



Technology built to exceed  
industry standards

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General Metal Finishing

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Corrosion protection coatings

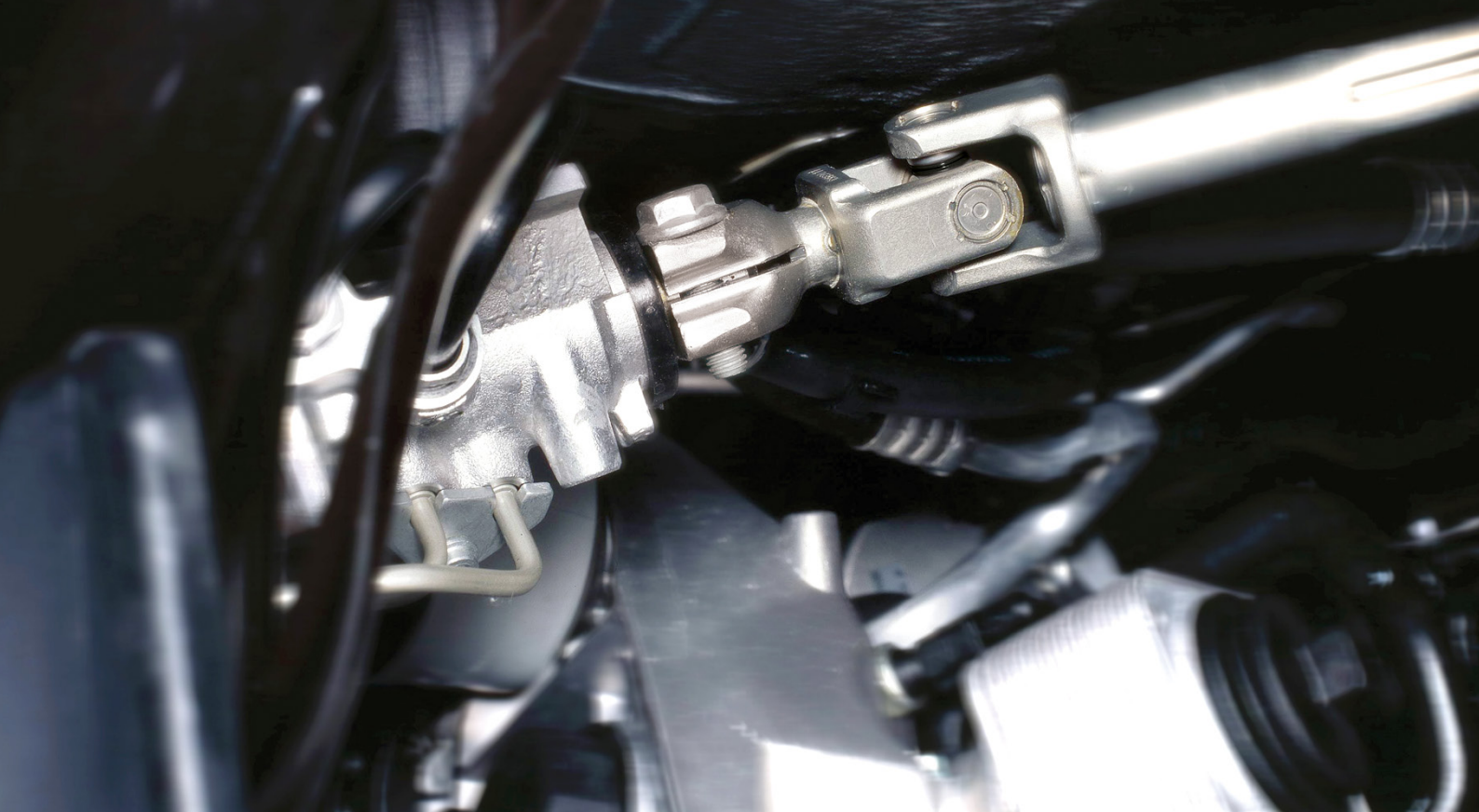
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[atotech.com](http://atotech.com)



# The best of corrosion protection





# We know corrosion protection

When it comes to high-performance corrosion protection, MKS' Atotech has the right solution. Both our Zn/Zn-alloy electroplating and zinc flake coating technologies greatly exceed industry standards. In order to maintain our technological leadership, we invested heavily in our worldwide TechCenters and our Corrosion Protection Competence Center in Trebur, Germany. Highly skilled R&D teams are committed to pioneering innovative solutions and setting benchmarks in the development of world-class corrosion protection processes, particularly when it comes to the combination of our two related technologies.

## **Two technologies, one trusted partner**

We develop leading corrosion protection solutions that balance functional, durable technology with contemporary aesthetics. Industry leaders worldwide choose Atotech as their trusted partner.

## **The best of both worlds**

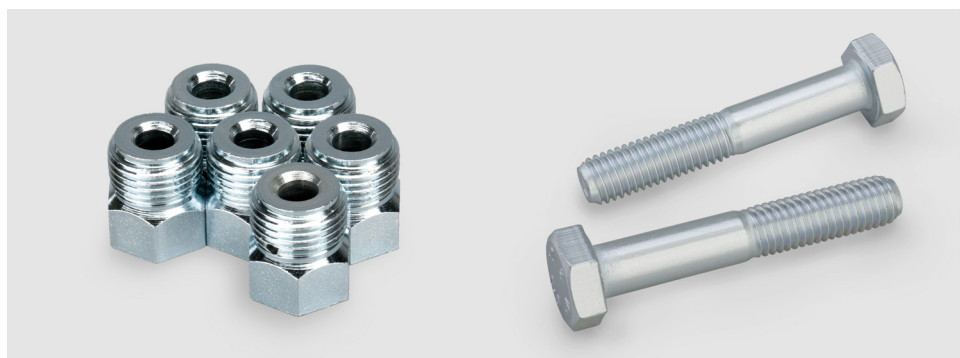
For specific applications, MKS' Atotech has developed a dual-action approach that leverages the combined benefits of our top coats with our zinc and zinc nickel coatings. Used in tandem, these products ensure the highest-quality corrosion protection and chemical resistance, as well as an exceptionally long-lasting appearance.

# Highest protection with electrolytic zinc and zinc alloy processes

MKS' Atotech product portfolio includes all varieties of zinc plating additives and a very comprehensive range of zinc nickel processes.

## Zinc electroplating processes

Our extensive range of zinc electroplating technologies includes first-rate chloride acid and cyanide-free alkaline zinc processes suitable for both rack and barrel applications. The excellent throwing power of our processes enhances overall productivity by allowing for the faster loading of parts.



**Zylite®:** Range of chloride acid zinc processes providing outstanding glossy coatings with superior covering properties and a stunning chrome-like appearance.

**Protolux® & Unizinc NCZ:** Cyanide-free alkaline zinc plating processes, providing ductile coatings with a bright surface appearance and outstanding thickness distribution, even on complex shapes.



## Auxiliary equipment

### ZYpHEX® regeneration system for acid zinc and zinc nickel electrolytes

ZYpHEX® is MKS' Atotech regeneration system for Zylite® acid zinc and Zinni® acid zinc nickel electrolytes. ZYpHEX® ensures that process conditions are consistent over extended operation times. This enables customers to increase production throughputs, saving both time and money.

# Zinc alloy electroplating processes

We are constantly improving and extending our zinc alloy electrolytes portfolio to ensure that we meet the highest standards of corrosion protection. Today, we offer a complete range of acid and alkaline zinc nickel electrolytes. The processes achieve outstanding corrosion protection by producing a real  $\gamma$ -phase zinc nickel structure.

MKS' Atotech acid zinc nickel processes produce unparalleled bright coatings. Matt and semi-bright zinc nickel coatings are also available. These solutions are particularly well-suited for the brake caliper industry, as the processes allow for direct plating on cast iron substrate. Our acid zinc nickel range is also perfectly suitable for hardened fasteners.

Our alkaline zinc nickel electrolytes are well known for their high efficiency, as well as for their ease of operation. They provide attractive bright to semi-bright deposits with exceptional corrosion protection – particularly on unusually-shaped parts.



**Zinni® 220:** A boric acid and ammonia-free acid zinc nickel electrolyte that provides improved throwing power, resulting in higher thickness in low current density areas.

**Reflectalloy®:** Used around the world and approved by global automotive OEMs, Reflectalloy® provides flexible handling and is especially suited for rack applications.

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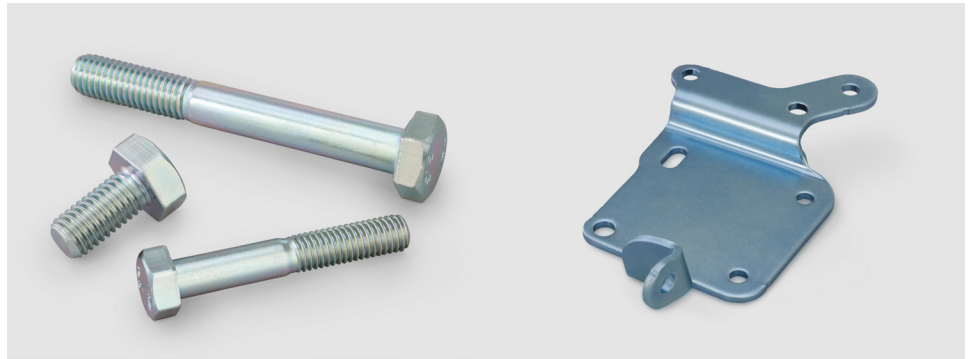
## Membrane anode technology for zinc nickel electrolytes

MKS' Atotech patented membrane anode technology for alkaline zinc nickel electrolytes increases process stability and enhances process throughput and overall coating quality, all with a reduced environmental footprint. Membrane technology ensures that the electrolyte always stays close to the status of a fresh made-up solution.

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# Passivates

MKS' Atotech product range also includes a vast array of conversion coatings. These supplementary finishes lend extra mileage to zinc or zinc alloy coatings. Our Cr(III)-based passivates come in black, blue, clear and iridescent finishes and are suitable for all zinc and zinc alloy surfaces. MKS' Atotech passivates feature a winning combination of excellent corrosion protection, striking aesthetic appeal and sustainable production.



**EcoTri® NF:** A fluoride-free, iridescent thick film passivate for zinc applications. Operating at a low temperature (between 25 - 40 °C), the zinc dissolution rate is reduced considerably during passivation.

**Tridur® DB:** A fluoride-free two-component deep blue passivate for zinc nickel surfaces. Suitable for both rack and barrel applications, Tridur® DB produces an even, attractive deep blue finish.



## Auxiliary equipment

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### Tricotect® ion exchange technology for passivates

MKS' Atotech production-proven ion exchange system Tricotect® selectively removes contaminating metals from high-performance passivates. Tricotect® allows for continuous online purification without interrupting production, providing a potentially unlimited bath life for the passivate.

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# Sealers

Suitable for all zinc and zinc alloy surfaces, MKS' Atotech line of sealers provides the very best in corrosion protection, thanks to a unique formula. Atotech also offers a selection of sealers with integrated lubricants. Developed especially for the fastener industry, these sealers allow customers to finely adjust the coefficient of friction within narrow working windows. The product range is also complemented by a series of black pigmented sealers designed to enhance protection and intensify black surface appearance. For unsealed surfaces, MKS' Atotech offers Cr(III)-based post-dips, which can be applied after passivation to meet the industry's corrosion protection requirements.



**Corrosil® Plus 319L:** Specifically developed to meet the needs of the automotive industry, Corrosil® Plus 319L provides a coefficient of friction of  $0.15\mu \pm 0.03$  for barrel applications. The deposited film provides a sleek, glossy appearance, making it the ideal choice for black surfaces.

**Sealer 300 W:** The patent-protected inorganic reactive Sealer 300 W family provides exceptional corrosion protection, even after assembling. During drying at temperatures above  $60\text{ }^{\circ}\text{C}$ , the sealer reacts with the underlying passivate to form a unique crack-free bond.

# Highest corrosion resistant standards with zinc flake technology

MKS' Atotech zinc flake coating technologies provide a high grade of corrosion protection, using combinations of specialized base and top coats. Largely embraced by the fastener industry, our coatings find widespread use within a variety of applications, ranging from fasteners, hose clamps, clips, brake components or chassis parts for the automotive industry, to special fasteners in the wind power, construction and other industries.

## Base coats

To comply with high industry corrosion protection requirements, a reliable, high-performance base coat is key. MKS' Atotech signature series of Zintek® base coats is comprised of both silver and black base layers. During baking, a conductive zinc aluminum coating with inherent cathodic protection is formed. The typical curing temperature during this step is between 200 - 250 °C. This controlled temperature prevents the hardened steel parts from softening during the process. Because the base coat is applied via a non-electrolytic dip spin, spray or dip drain technique, the risk of hydrogen embrittlement is eliminated. In line with MKS' Atotech environmentally approach, our base coats are free of nickel, lead, mercury cadmium, cobalt or Cr(VI).



**Zintek® 200:** MKS' Atotech premium silver base coat provides excellent adhesion and high impact resistance. Fasteners coated with Zintek® 200 can withstand more than 1,000 h of Neutral Salt Spray Testing.

**Zintek® ONE HP:** This silver inorganic zinc flake base coat provides reliable corrosion protection with only one coating layer. It's a particularly cost-effective process.

**Zintek® 300 HP:** This black zinc flake base coat successfully delays white corrosion formation allowing for an exceptionally uniform deep black appearance.



# Top coats

Applied directly to either MKS' Atotech zinc flake base coats or electroplated zinc or zinc alloy layers, our line of organic and inorganic top coats form unique multipurpose coatings with additional benefits. As a natural match for our collection of base coats, both our organic and inorganic top coats are available in silver and black.

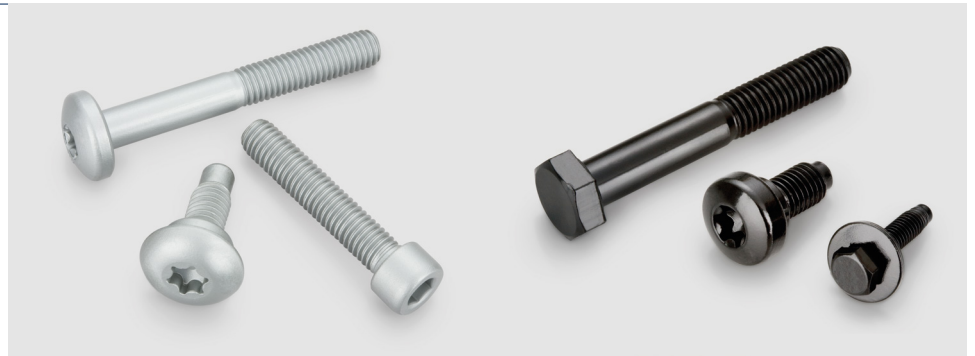
## Organic top coats



**Techseal®:** The organic Techseal® product line delivers best chemical resistance, uniform appearance and increased corrosion protection with controlled friction values.

**Techdip®:** The Techdip® range features products with enhanced UV-stability and inimitable adhesive properties. Products with Techdip® finishes also earn top marks in the Kesternich test 2.0.

## Inorganic top coats



**Zintek® Top XT:** Transparent inorganic top coat featuring first-class NSST and cyclic corrosion resistance on zinc flake base coats, as well as electroplated / passivated finishes, applied with only ~1µm.

**Zintek® Top Black S:** Appealing glossy black inorganic top coat applied with a very thin layer (~1µm) and providing excellent corrosion resistance, especially against white rust formation.



# Combining strongest technologies

Coating systems that combine zinc / zinc nickel, passivates and top coats are capable of providing extraordinary corrosion protection with an appealing and durable appearance. These combined coating systems allow the industry to keep up with continuous improvement requirements, such as the automotive industry's demands for both increased corrosion protection and improved appearance of electroplated parts. Atotech strives to provide high-end corrosion protection while avoiding visual changes, such as the appearance of white haze.

Atotech combines components of both corrosion protection technologies and has developed coating sequences that can fulfill these ambitious requirements. Besides a stable and attractive appearance, even after neutral salt spray testing (NSST), such layer combinations also exhibit temperature stability, chemical resistance, consistent coefficient of friction values and much more.

## Most common combinations

Silver top coat	Black top coat	Black top coat
Transparent passivate	Transparent passivate	Black passivate
Electroplated zinc or zinc alloy	Electroplated zinc or zinc alloy	Electroplated zinc or zinc alloy

# Setting industry benchmarks



## Automotive

MKS' Atotech processes fulfill the requirements of a substantial number of OEM specifications and are approved by automotive manufacturers worldwide. Atotech develops corrosion protection solutions that balance functional, durable technology with contemporary aesthetics.



## Wind energy

Fasteners for offshore plants have to meet the highest standards for corrosion protection and mounting. Using advanced chemistry to ensure optimal assembly and protection processes, Atotech produces sustainable products that meet all industries' requirements.



## Construction

Specifically developed to meet the demanding needs of the construction industry, MKS offers system solutions that provide superior corrosion protection even after bending. MKS' Atotech portfolio comprises bright, bright and bendable and matt systems.



## Heavy machinery

Our corrosion protection portfolio includes reliable, highly resistant solutions for heavy machinery hydraulic rods or pneumatic fittings for the agriculture, mining and oil and gas industries.



## Railway

In the railway industry, fasteners and brake components require top quality coatings. We offer two coating methods for railway applications, both of which are equally dedicated to perfecting corrosion protection.

## Did you know...

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10 TechCenters worldwide are dedicated to corrosion protection technologies

> 1,600

customers around the world rely on our corrosion protection technologies



We offer the most comprehensive product range of sustainable plating solutions

# End markets and industries MKS serves



Automotive



Sanitary



Heavy machinery



Construction



Household appliances



Energy

