



surface  
technologies



surface treatment | polymer

# Aalberts surface technologies

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Aalberts surface technologies is part of the worldwide leading and globally positioned technology company Aalberts N.V., in short Aalberts, with its 135 locations worldwide and more than 16,000 employees. We are one of the world's leading suppliers of functional surface refinements. In addition, we offer our customers an extensive range of surface technology process chemicals.

For more than 50 years, we have been improving component properties according to the local or global requirements of our customers. Our capabilities range from economically efficient coating of mass-produced small parts to individual solutions for sophisticated individual components. The investment power and financial strength of Aalberts enable us to realise large projects for our global key accounts.

# our values

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At Aalberts surface technologies, we place emphasis on

- Appreciation of our employees
- A close trusting relationship with our customers
- Close collaboration between customer design teams and process technology
- Consistent implementation of the respective national and European environmental regulations
- Development of suitable coating processes
- Durability and best functional coating properties
- Innovative energy management
- Meticulous quality management
- Numerous patented processes
- Project support from experts, right from the start
- Seamless digital documentation
- Social and environmental responsibility
- Solutions for individual customer requirements
- State-of-the-art rack technology and production facilities



## the coating makes the difference

Only very few materials naturally have all the desired properties. Whether **optimum sliding and non-stick properties** in mechanical engineering or the **elegant feel** of our smartphones, only high-quality surface coatings from Aalberts surface technologies transform a material into the product that meets your expectations.

Surface coatings are an **important refinement step**. Different requirements are placed on the respective coating depending on the product. **Technical aspects** are crucial in addition to **appearance**. In particular, these include **protection against corrosion or wear**.



Aalberts surface technologies also develops innovative technologies for e-mobility, from acoustics to battery and fuel cell technology to power tubes for e-bikes.

## our processes

Coating solutions for surfaces of all kinds, from development to application - for a better performance of your products. This is the quality of **Aalberts surface technologies**.

We develop **surface coatings according to your wishes!** Surface refinements facilitate and improve productivity in almost all industries. At Aalberts surface technologies we offer a **wide range of industrial coatings of the highest quality** and have in-depth and extensive expertise. Our specialists have undertaken the task of developing the appropriate surface for every application.

Industrial components often have to be particularly durable and resistant, as they can sometimes be exposed to extreme conditions: Heat, cold, compressive and tensile forces, strong friction or moisture can cause them problems. Whether **machine components** in industrial manufacturing production cycles or **transmission parts** in the new model of an **automotive group**: the demands on the properties of many material surfaces are high. But not all materials are suitable from the outset to meet these high demands. With our **refined and innovative processes**, we put the finishing touches to your products.

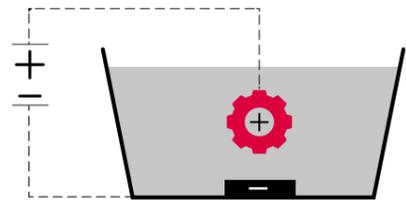


- Anti-friction coatings
- Antimicrobial coatings
- Corrosion protection coatings
- Decorative coatings
- Non-stick coatings
- Special coatings for e-mobility
- Traction coatings
- Wear protection



# coating solutions from A-Z

## Anodizing and hard anodizing



Anodizing is suitable for functional as well as decorative finishing of aluminium materials. Aluminium surfaces acquire good corrosion and wear protection. We also offer colored anodizing coatings. Hard anodizing is a particularly versatile coating with various process variants and post-treatment options. Aluminium oxide polymer composite layers are formed through anodic oxidation of the base material and simultaneous molecular bonding of the aluminium oxide layer with polymers. The layers are very wear-resistant and hard, showing increased corrosion resistance or improved anti-friction properties.

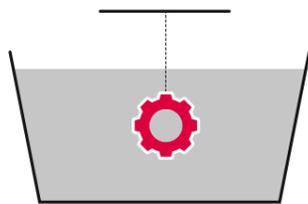


Colored anodized covers



Electroless nickel-plated turbocharger compressor wheels

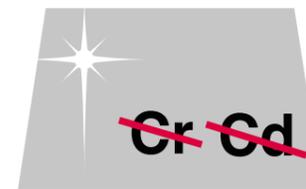
## Electroless nickel plating



Electroless nickel plating takes place as deposition without an external power source. The performance spectrum of the coatings ranges from chemical resistance, corrosion and wear resistance, dimensional accuracy and optimum anti-friction properties to electrical conductivity and increased hardness. The coatings are deposited uniformly and true to contour. An electroless nickel layer can also be produced with integrated polymers. This forms self-lubricating surfaces with high wear and corrosion protection. The wear resistance is also significantly increased by the inclusion of silicon carbide.

# coating solutions from A-Z

## Chrome and cadmium substitute



For chrome and cadmium substitutes, we use a Physical Vapour Deposition (PVD) process and produce a pure, extremely thin aluminium layer in a high-vacuum process. The chromium substitute is suitable for almost all plastics and metals. The cadmium substitute is intended for steel and titanium components. In addition, we offer chromium-free passivations as protective layers on aluminium surfaces, which prevent or greatly retard corrosion of the base material.

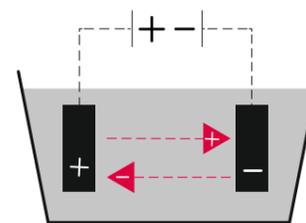


Cadmium substitute fixing elements



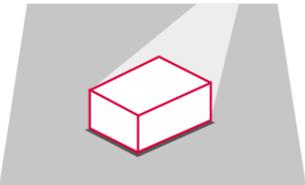
Electroplated tin elements

## Electroplating



Electrochemical deposition of a thin metallic layer on the surface of a conductive metallic component is called electroplating. This primarily improves the characteristics of a component such as, for example, wear resistance, corrosion resistance or anti-friction properties. We produce the following metallic layers: copper, gold, nickel, nickel sulfamate, silver, zinc, zinc-iron, zinc-nickel and tin.

## Anti-friction coatings



Dry lubricant anti-friction coatings are designed to reduce friction and surface wear as well as to avoid noises. The coating materials are water-soluble. Various methods of application are possible. The type of application method depends on the geometry and quantity of parts to be coated, the type of liquid coating material used (e.g. single or multiple component system) and the requirements of the final coating. All metals, light metals and plastics intended for industrial use can be treated, depending on the processing type. Depending on the process variant, anti-adhesive properties, wear protection, dry lubrication and corrosion protection are effectively combined.

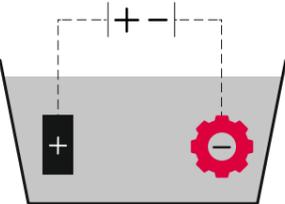


Lubricant coating



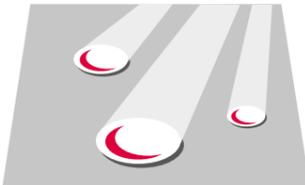
Cathodic dip painting

## Cathodic dip painting



Cathodic dipping means immersing a negatively charged workpiece in a paint bath containing positively charged particles. The component to be treated attracts the particles, forming an even coating on the entire surface. Once the layer of paint is applied, we finish the process by baking on a protective film. Cathodic dip coating is suitable for high quantities or complicated designs. The created layers are contour true, corrosion-resistant and impact-resistant. Cathodic dipping is an ideal topcoat for zinc surfaces and particularly beneficial for priming a conventional paint or for powder coating.

## Nanocoatings



With a nanocoating, nanoparticles bond firmly to the surface and ensure that dirt, water and other fluids are repelled (lotus effect). A nanocoating can be applied to virtually all materials. It is temperature-resistant and ideally suited for fine-pored materials and high-precision applications such as ultra-thin non-stick coatings for easy removal of molded parts from the mold or as a protective film for frequently cleaned surfaces like glass and facades.

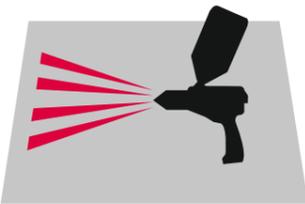


Nanocoating



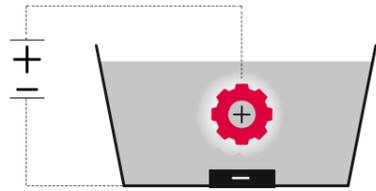
Wet painting

## Wet painting



Wet painting is used to apply a surface protection coat to materials that are both electrically conductive and non-conductive. This technology uses conventional solvent-based PUR paints, solvent-free water-based hydro paints or VOC-compliant high-solidity paints, which - due to their high proportion of solids - have a significantly lower solvent content compared with conventional paints. Wet painting allows the creation of attractive surfaces on virtually all substrates. Almost all options regarding color hues, structure and effect are possible.

## Plasma-chemical coatings



Plasma-chemical coatings are anodization processes in which an oxygen plasma discharges at the surface of the material during the process. White layers are suitable for the refining of magnesium and aluminium alloys. The coatings offer improved wear and corrosion protection as well as high hardness. Main properties of black layers, which can also be applied to titanium alloys, are low light reflection (5%), high light absorption (95%) and extremely good UV durability. That's why black work pieces can't lose their color. Plasma-chemically coated substrates offer absolute contour accuracy and dimensional stability and have a much higher bending fatigue strength than substrates with conventionally anodized layers.

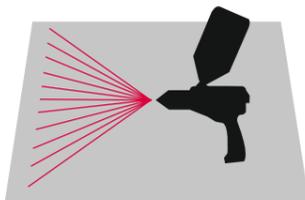


Uncoated and white plasma chemically coated magnesium tube



Polymer coating in the food industry

## Polymer coatings

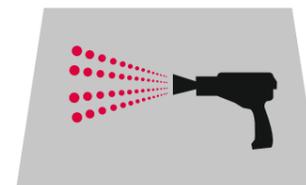


Polymer coatings can be applied to a wide variety of base materials and offer long-lasting protection. They are particularly well anchored mechanically to the substrate. Additional enhancement layers allow non-stick coatings to be combined with improved sliding properties and/or high wear resistance. The use of special polymers allows hydrophobic surfaces to be created and reliably prevents various substances, such as adhesives, rubber, synthetic materials or food ingredients, from sticking to these surfaces. The targeted alteration of the surface structure using defined roughness profiles enhances the non-stick effect by reducing the contact area. Our polymer coatings are FDA-approved and therefore used primarily for food production.

## Powder coating

In powder coating, the electrical effects support the even coating by the paint powder. Through a subsequent thermal treatment, the melting powder forms a uniform and very well adhering surface coating. The layers produced have very good scratch resistance, high impact protection and excellent corrosion protection. They are very weather and temperature resistant.

In addition to excellent functionality, powder coating offers a wide range of decorative possibilities: We have an extensive color palette available with all shades from the Pantone, NCS and RAL color systems.



# coating solutions from A-Z

## Screw locking



Vibrations and movement of materials are detrimental to the security of connections and can lead to instability. We at Aalberts surface technologies have developed high-performance coatings that we apply to screw connections subject to extreme stress – enabling them to resist unusually high load. For screw locking, we have all the coatings required on the market and all licensed coatings available. Our thread locks are used primarily in the automotive industry and the construction industry – where people and machines have to be reliably protected. We coat all kinds of connecting elements, in many different sizes and screw variations, to make them more secure and to improve sealing: screws, nuts, grub screws and special parts.



Nuts and bolts with adhesive thread pre-coating



Aluminium component with partially coated surfaces

## Selective coatings

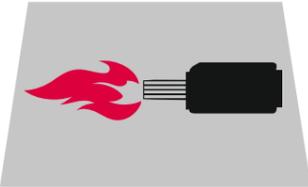


Selective coating means precise treatment of defined surface areas. We are able to selectively create a hard anodized layer on defined areas of an aluminium component. The advantage of selective coating is that any mechanical reworking of the surface is eliminated. Component surface areas which are to be left uncoated are covered, inside a tool, with an integrated sealing system. An electrolyte is pumped from a reservoir into the tool and it passes between the free component surface and the tool housing. In addition, we offer also on request selective coatings such as hard chrome, gold or nickel-phosphorus to improve wear resistance or electrical conductivity.

For partial wear protection of aluminium components, partial oxidation by laser may be considered.

# coating solutions from A-Z

## Thermal spraying



Various metal alloys or hard metals are used in powder or wire form as coating materials for thermal spraying. They are melted or fused and accelerated onto the component to be coated. Components can be, for example, drive shaft bearings and turbine and compressor rotors. Thermal spraying is particularly suitable for restoring the geometry and function of worn components using our fast and flexible repair service. Thermally sprayed coatings with their surface hardness give excellent wear protection. Through the targeted combination of materials and coatings, further durability and excellent functionalities are achieved.



Thermal spraying



Automotive and medical components with DLC coating

## Vacuum coating



When the coating to be applied has to be especially thin, the best results are achieved in a vacuum. We control the chemical reactions and reduce impurities to a minimum. After all, extremely fine coatings can reach their potential only with a high degree of purity.

Our atomically anchored nanolayers are based on two advanced vacuum coating processes: Via electric arc (PVD process) metal is vaporised, ionised and then hurled onto the workpiece in an electric field. Reactive gases make it easy to create surfaces such as carbides, oxides or nitrides. Plasma Enhanced Chemical Vapour Deposition (PECVD) enables gaseous substances to be deposited on the substrate at less than 200°C. This technology is ideal for extremely hard „diamond-like carbon“ coatings. The most important properties of the vacuum coatings are non-stick properties, wear and corrosion protection, protection against cold welding and, in the field of medical technology, biocompatibility and hypoallergenicity.

### Sealing



The surfaces of aluminium alloys and anodizing layers are sealed with the aid of a dipping varnish. Very uniform layers are created, even on complex components with internal surfaces such as bores or cavities. Sealing the surface increases corrosion resistance and significantly increases alkali resistance. It is biocompatible and safe for use with foodstuffs in accordance with FDA regulations.

### Zinc flake coating



The zinc flake finishing process is non-electrolytic. Techniques such as dip-spinning, spraying, dip coating or wet painting apply extremely corrosion-resistant zinc flake coatings. In contrast to other finishes, they permanently prevent damage caused by hydrogen embrittlement. Our sophisticated coating processes are ideal for complex shapes and bulk solids. Zinc flake coatings are used throughout the world in the automotive and construction industries as cathodic anti-corrosion coatings. In combination with post-treated thin organic or inorganic coatings, these can also provide color, chemical resistance, low electrical conductivity, and screw connection properties. If required, relubrication or screw locking is also possible.



# at home in all industries

Whether the strict food industry regulations or the high corrosion protection requirements of automobile manufacturers - every **industry** is faced with special challenges. First-class industrial coatings from Aalberts surface technologies are specifically developed according to these requirements and contribute daily to the success of **numerous customers from various industries.**

We refine over one billion components per year for all key industries!

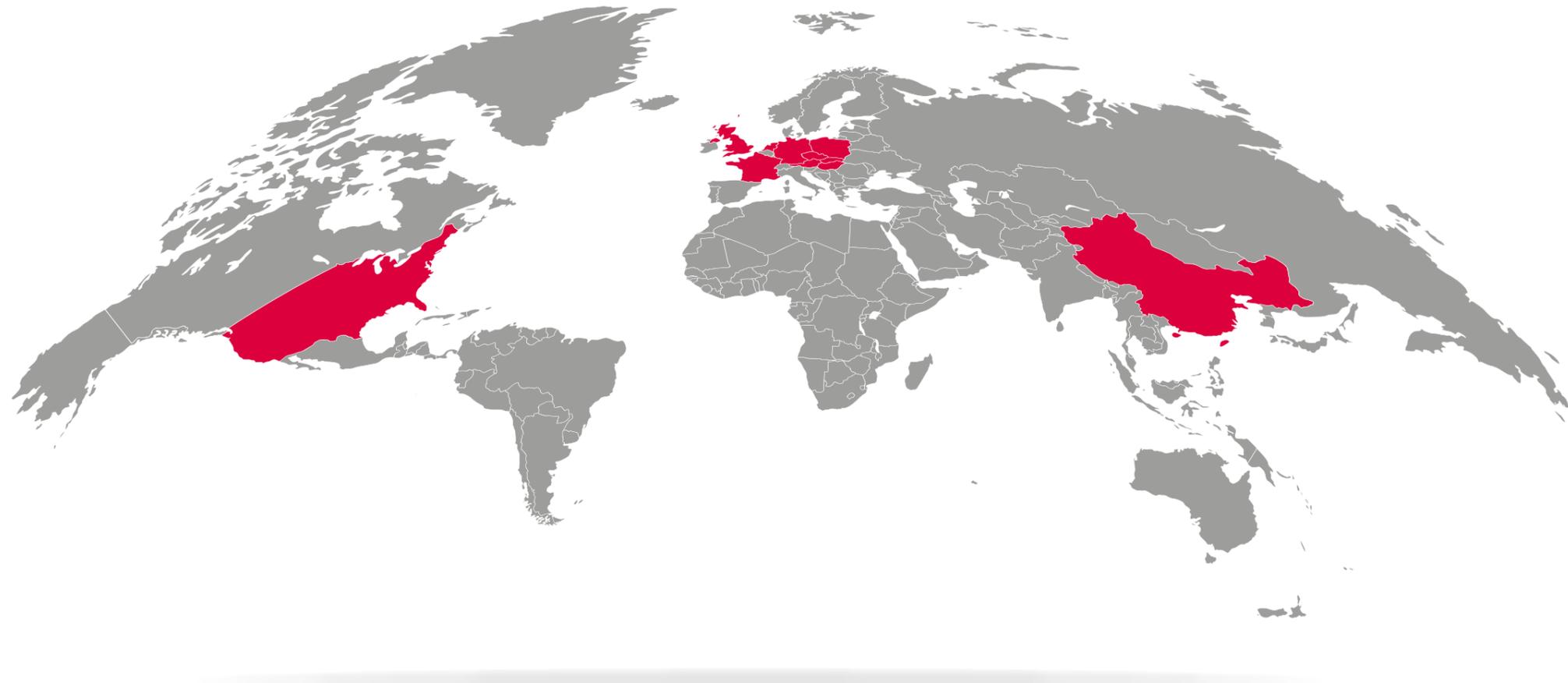


a strong global network

locations in europe, asia and the USA

think global - best practice local

high quality standards in all plants



## our strengths

- Coating expertise
- Process diversity
- Industry expertise



## we are certified according to

- ISO 14001
- ISO 9001
- ISO 50001
- ISO 9100
- IATF 16949
- Nadcap



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