

**Acheson**

**LOCTITE**

**Multan**



**Lineguard**

**Alodine®**

**Teroson**

**CERAMISHIELD  
RobotIQ**

## Integrated solutions for the entire manufacturing value chain



Excellence is our Passion

High-quality and corrosion-resistant die-cast components pass through a number of process stages before they can be deemed 'complete'. Aside from the actual casting process, machining, component cleaning, pretreatment and final assembly all have a decisive influence on their value. Henkel is able to offer premium products covering all the manufacturing stages mentioned. Indeed, the company's portfolio includes everything from high-performance lubricants and lubricoolants to specialty cleaners, conversion coatings, adhesives and sealants. Henkel also supplies specific application equipment for water free systems compatible with the specific fluids that it handles. Henkel is able to ensure the ideal interplay between all the process stages, securing maximum value added at every turn.



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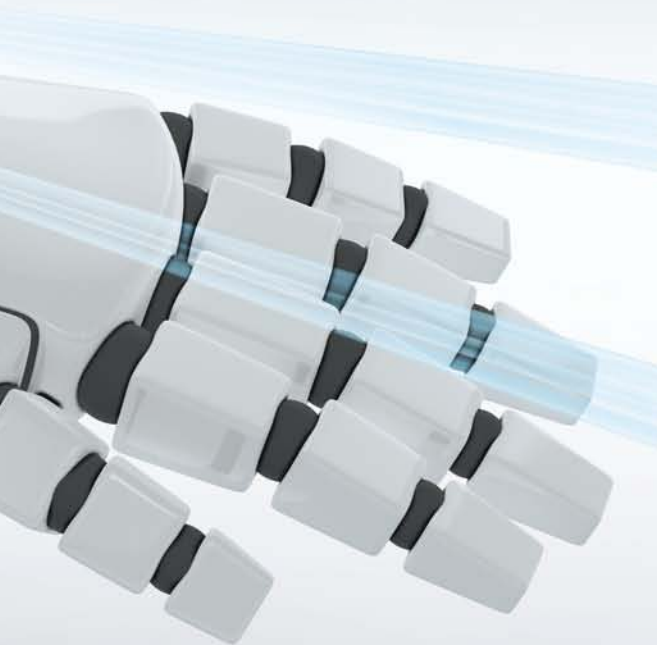
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# CASTING & IMPREGNATION

## Deltacast® CP

Release agent for the pressure die-casting of aluminum, magnesium and zinc components.

The Deltacast® CP range of water-based release agents are specifically designed for the pressure die-casting, thixo-casting and squeeze casting of aluminum, magnesium and other non-ferrous metals. All Deltacast® CP release agents provide superior release and lubrication at extremely cost-effective dilution ratios. The large range of Deltacast® CP formulations allows for specialist products for niche applications, e.g. very thin castings, radiators or structural castings.

### Benefits:

- Highly concentrated products and advanced formulation allow extremely high dilution ratios (up to 300:1)
- Patented formulations give market-leading release properties
- Very clean and paintable castings with high surface finish (e. g. special formulations for electronic applications)
- Higher wetting temperatures protect dies and allow higher production rates
- Wax-free formulations are available, reducing die maintenance and down-time
- Deltacast® CP release agents allow for highly optimized processes and maximum productivity

## Sustainability

### Water & wastewater:

High wetting temperatures reduce cooling-water needs.

### Energy & climate:

Highly concentrated products = reduced transport costs.



## Deltacast® Liquid Powder

Perfection in die management technology based on separation of film formation and thermal die management (cooling).

Deltacast® Liquid Powder is a completely integrated die cooling and lubrication process. It includes the process chemical, lubricant 'plug and go' container, application tool, electronic and hydro-pneumatic controls. Spray tool efficiency and flexibility are optimized when the system is mounted on a robot.

### Benefits:

- Reduced porosity and parts rejects
- Improved casting quality and surface finish
- Homogeneous film formation on dies across the widest possible temperature range
- Process chemical with excellent release properties
- Reproducible process

## Sustainability

### Materials & waste:

Deltacast® Liquid Powder technology based on separating of film formation and thermal die management minimizes wastewater to treat and vapor to extract.

Deltacast® Liquid Powder contributes to reducing waste costs and the environmental impact of your foundry.





## Deltacast® CG

Die coatings for the gravity and low pressure die-casting of aluminum and other non-ferrous metals.

The Deltacast® CG range of die coatings are specifically designed for gravity and low pressure die-casting of aluminum other non-ferrous metals. All Deltacast® release agents provide superior release and lubrication at extremely cost-effective dilution ratios. The large range of Deltacast® CG formulations allows the die-caster to select the precise surface texture required on each part of the die. In this way complex components can be cast with the required surface finish.

### Benefits:

- Easier product handling and more consistent coating through products that are much slower to settle when diluted
- Long-life coatings give maximum productivity, reducing the need for touch-up procedures
- Colored base coat gives visual indication of coating wear
- Extensive range from the coarsest to the finest coatings
- Ability to produce superior surface finish and therefore reduce machining operations. Alloy wheels can be cast without the need for machining on the outer face

## Sustainability

### Energy & climate:

Highly concentrated products = reduced transport costs.



## Loctite® Impregnation

Impregnation of various cast parts made of aluminum, cast iron or brass like engine blocks, oil sumps, cylinder heads/covers, gear-boxes, filter housings, fittings and many more.

Microporosity in parts made of cast metals and non-leakproof areas in electrical components may cause pressure leaks, inferior surface quality, corrosion and high reject rates. Loctite® vacuum impregnation can reliably seal porosities, shrinkage pores, capillaries and cracks.

### Benefits:

- Loctite® impregnation reduces overproduction and reject rate
- Our Resin (Resinol 90R) is an environmentally friendly recycling technology
- Loctite® Impregnation systems are fully automated processes with high capacity
- Excellent resistance to chemicals and temperature
- Excellent sealing result
- Cost saving
- Fast and flexible impregnation service
- All our Impregnation Service Centers and processes are certified according to ISO/TS 16949, ISO 14001 + BS OHSAS 18001

## Sustainability

### Energy & climate:

The impregnation process enables thin-walled diecast parts to be produced. This saves weight and contributes to environmental protection.

### Water & wastewater:

Loctite® vacuum impregnation incorporates a recycling system, with which impregnants are continuously recovered from the washing water and fed back into the impregnation process. The water is also reused.

### Materials & waste:

Impregnation reduces reject rates, so that parts can still be used and material and machines can be employed more efficiently.



# MACHINING

## Multan®

Multan® metal fluids for a broad range of powertrain applications, e.g. machining of engines, cylinder heads, turbochargers, gearboxes, steering and brake systems etc. They provide excellent performance for precision components.

The high-performance metalworking fluids of the Multan® product range are suitable for the economical cutting and forming of light metals, cast iron, steel alloys and non-ferrous metals. The cutting fluids and cleaners from Henkel are based on a modular system. Consistent use of the same patented emulsifier and corrosion protection modules ensures the best possible compatibility of the metal processing and cleaning stages.



### Benefits:

- Very good cleaning and cooling performance
- Minimal product consumption
- Low reject rate and good surface quality
- Highly compatible with aluminum surfaces
- Longer tool service life
- Inhibitors prevent corrosion of aluminum and non-ferrous metals

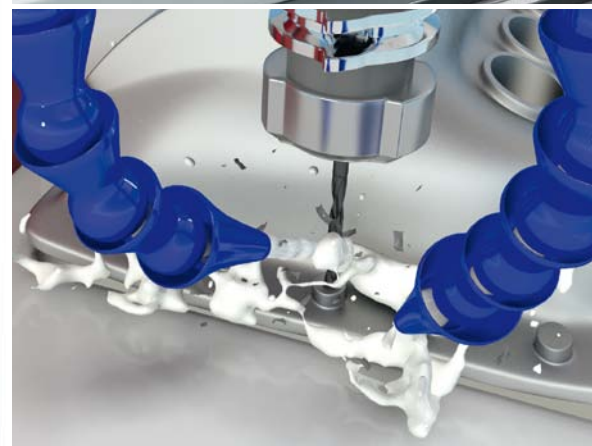
## Sustainability

### Water:

Reduced concentrate consumption.

Water savings through 10-15% reduction in concentrate in the application emulsion.

Reduction in wastewater.







# CLEANING

## P3®

Broad range of cleaners for post-casting processes and cast parts such as engine, aluminum wheels and gearbox parts (gear wheels/shafts/housing).

P3 Neutracare® 6300 for low temperature applications and P3 Neutracare® 3300 with outstanding demulsifying properties are neutral cleaners, used in dip or spray processes.

P3® cleaners remove machining oils, emulsions, metal forming agents, dust and pigments from manufactured parts that have been shaped by metal cutting or metal forming processes.



### Benefits:

- Greater economic efficiency through simple bath maintenance (separator)
- No further additives needed for oil separation
- Consistently good corrosion protection, especially in association with long intermediate storage times
- Sprayable foam-free at virtually all temperatures and pressures – high-pressure sprays > 600 bar
- Suitable for steel, cast iron and aluminum alloys

## Sustainability

### Water & wastewater:

By using P3®, you achieve a reduction of up to 50 % in wastewater and a reduction of up to 30 % in water consumption.

### Materials & waste:

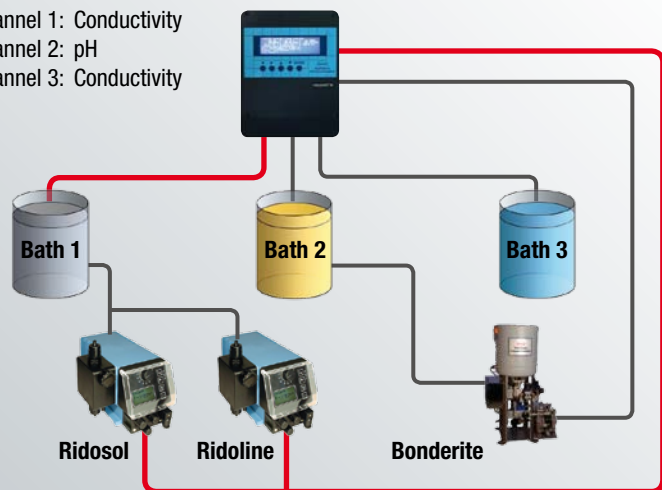
With P3®, you use up to 30% less cleaner and need no additives.

## Lineguard®

Henkel's equipment and systems for its surface treatment products and processes incorporate over 40 years of experience in the design, building, and maintaining metal treatment control systems with the latest technology PLC's, sensors and operator control interfaces. You can find the latest innovations in chemical pretreatment and pumping systems, PLC based or solid state process controllers, and a variety of process control modules to choose from to complete your system requirements.

Lineguard® – the intelligent, modular system for controlling metal pretreatment plants. Effective and efficient bath management.

Channel 1: Conductivity  
Channel 2: pH  
Channel 3: Conductivity



### Benefits:

- Measurement of up to 3 parameters with one instrument
- Easy to operate thanks to touchscreen
- Simple handling of chemical dosage and measurement
- Enhanced coating quality
- Fully automated solution
- Lower production costs

## Sustainability

### Materials & waste:

The Lineguard® system ensures that chemicals are utilized more efficiently, thus reducing the volume of waste. Overall, the system contributes to resource conservation.

### Health & safety:

The manual handling of chemicals makes considerable demands on occupational health and safety, and necessitates a high degree of caution even when carrying out daily routine tasks. The lower the amount of manual handling, the lower the number of incidents resulting in unplanned downtime. The Lineguard® system is a technical bath-control solution that improves process reliability and occupational health and safety.





# METAL PRE-TREATMENT

## Alodine®

Surface treatment for aluminum and magnesium parts (light metals, bodies, casting alloys).

Alodine® is the ideal corrosion protection for light metals. It ensures preparation and priming for painting and also covers the etch passivation as pretreatment for subsequent welding and/or bonding.



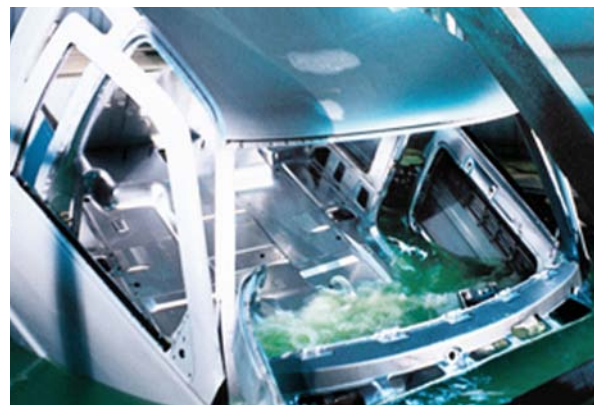
### Benefits:

- Chrome-free
- Excellent corrosion protection
- No regulated heavy metals
- Stable, efficient process
- Dipping or spraying application possible

### Sustainability

#### Materials & waste:

Reduced waste and thus less maintenance costs (compared to conventional zinc phosphating).  
Less water consumption.



# Alodine®

# ASSEMBLY

## Loctite® Gasketing

Sealing of metal-to-metal flange connections in vehicle powertrain, e.g. on the engine, gearboxes, axles, add-on housings, covers, etc.

Liquid gaskets from Loctite® like Loctite 5188 are extremely flexible and provide the most advanced anaerobic gasketing technology.

## Sustainability

### Materials & waste:

The liquid anaerobic gasketing product can be applied so precisely that just the voids and imperfections of the flange surfaces will be filled. Therefore no product will be wasted but long term sealing is guaranteed.

### Health & safety:

Henkel-Loctite® is a system supplier who does not just offer the product itself, but also takes care about the application of the anaerobic liquid product onto customer parts. Henkel-Loctite® dispensing systems guarantee workers will not come into contact with the chemical even during replacement of product packs in production lines.

### Benefits:

- Excellent adhesive strength and flexibility after long term operation at high temperatures
- Ideal for applications in vehicle powertrain
- Exhibits excellent adhesion to metals, and especially to aluminum
- Tolerates micro-movements in highly stressed flanges
- Suitable for applications involving contact with oil and coolants



## Teroson® A&S

Cast parts such as inner door elements, seat frames and shells as well as axis parts can be assembled with our specialty metal adhesives.

Henkel's product range offers diverse structural and crash-resistant bonding solutions for automotive applications. These innovative adhesives for metals and plastics replace conventional joining techniques such as welding, bolting, riveting and clinching.

### Benefits:

- High load transmission through high mechanical strength
- Tolerates oily substrates
- Excellent long-term stability and aging properties
- Wide product spectrum for almost all applications
- Considerable design freedom and optimized joint zones



## Sustainability

### Health & safety:

Crash-resistant structural adhesives are eminently suitable for bonding safety-critical parts requiring joints with good load transfer properties, as in vehicle front ends and add-on components. They increase the passive safety of the vehicle as a whole through highly efficient impact energy absorption and distribution in the event of a crash.



## CERAMISHIELD RobotIQ®

CERAMISHIELD RobotIQ® is a complete solution that combines a highly effective protective coating with a dedicated application unit.

The ceramic CERAMISHIELD® LW-1 coating protects welding nozzles and contact tips for extremely long periods with just one application through the entire welding temperature range.

The versatile, fully automatic application unit interfaces perfectly with both the welding robot and the specific production processes.

The result: uninterrupted welding, increased throughput rate and high-quality welding results which give you a valuable competitive advantage.



### Fully automatic application:

CERAMISHIELD RobotIQ® significantly reduces interruptions to the welding process.



#### Benefits:

- Vastly improved efficiency and productivity through a continuous welding process
- Higher quality of welding seams due to a cleaner process, which reduces scrap rates
- Reduced consumable costs for nozzles and contact tips as a result of the improved process
- More sustainability through a water-based solution and better working conditions

### Sustainability

#### Energy & climate:

More sustainability (water-based and solvent-free).  
Cleaner and safer production and working conditions.  
Sustainable, environmentally friendly production.



**CERAMISHIELD**  
**RobotIQ®**





Excellence is our Passion

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