

***BONDERITE***<sup>®</sup>

# **PROCESS SOLUTIONS FOR AUTOMOTIVE COMPONENTS**



Henkel Adhesive Technologies

# HENKEL, YOUR ***TRUSTED SOLUTIONS PARTNER***

Innovative technologies for metal forming, machining, cleaning and surface treatment, to meet lightweighting, cost efficiency, and sustainability goals.

# CONTENT\*

<b>Customer Challenges and Henkel Solutions Offering</b>	<b>4</b>
<b>Metal Forming</b>	<b>8</b>
Casting Lubricants	<b>10</b>
Forging Lubricants	<b>12</b>
Cold-Forming Lubricants	<b>13</b>
<b>Machining and Cleaning</b>	<b>14</b>
Machining and Grinding Fluids	<b>16</b>
Part Cleaners	<b>17</b>
<b>Surface Treatment</b>	<b>20</b>
Zinc Phosphate	<b>22</b>
Thin Film Process	<b>23</b>
Light Metal Process	<b>24</b>
Anodizing Sealing	<b>25</b>
MPP Process	<b>25</b>
LineguardX	<b>26</b>
Lineguard Process Control Equipment	<b>26</b>
<b>Global Presence</b>	<b>28</b>

\*Please consult with your local Henkel team regarding regional availability of products referenced in this brochure.

*HENKEL'S AIM IS TO PROVIDE*  
***SUSTAINABLE SOLUTIONS***  
*TO OUR* ***CUSTOMER'S***  
***CHALLENGES AND NEEDS...***



## METAL FORMING

- › Within its range of BONDERITE® Metal Forming products, Henkel offers an extensive line of casting, forging and cold forming lubricants.
- › Oil- and water-based high-pressure die casting lubricants are made for conventional and micro-spray applications.
- › Advanced forging lubricants are formulated leveraging Henkel's more than 100 years' experience in graphite processing. The portfolio covers oil- and water-based graphite lubricants, as well as graphite-free forging lubricants made for excellent performance under extreme pressure and temperature conditions.



## MACHINING AND CLEANING

- › Our environmentally-friendly range of machining fluids offers extended tool life, part cleanliness and long sump life.
- › Henkel provides a broad cleaner portfolio that includes neutral and alkaline cleaners for customized solutions.

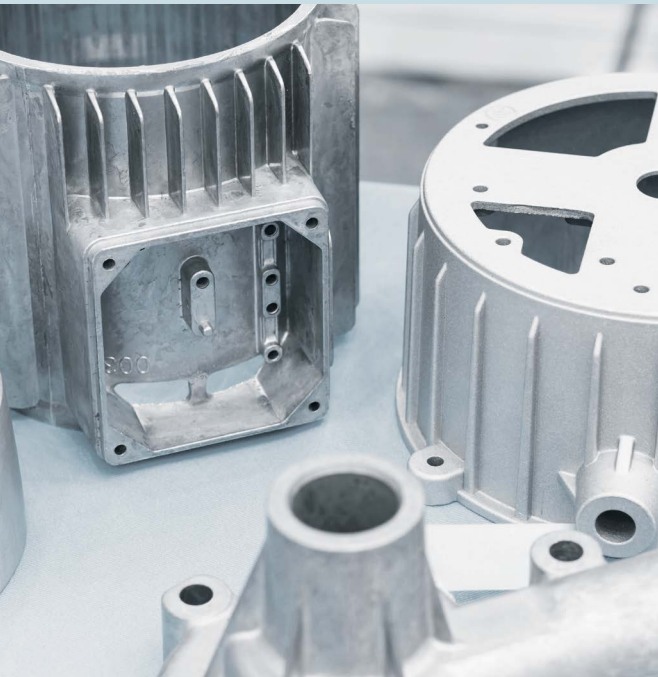


## SURFACE TREATMENT SOLUTIONS

- › Henkel is the global market leader in pretreatment technologies for multi-metal substrates and innovative chrome-free passivation processes for light metal components.
- › BONDERITE® pretreatment products are the industry standard for applications such as frames, steel wheels, aluminum wheels, axles, suspensions and seat frames, as well as structural parts and EV elements like battery boxes and battery coolers.



*...AND TO SUPPORT THEM*  
***WITH COLLABORATIVE***  
***PARTNERSHIPS AND***  
***COMPREHENSIVE***  
***SOLUTIONS.***



# HENKEL IS COMMITTED TO ENGINEERING EXCELLENCE AND YOUR COMMERCIAL SUCCESS, ACHIEVED THROUGH:



## UNMATCHED TECHNOLOGY PORTFOLIO

- › Henkel leads the market with **advanced thermal interface materials, adhesives and sealants, lubricants, cleaners and surface treatment solutions.**
- › Tapping into this complementary toolbox of materials together with our strong R&D competencies, **Henkel works to solve customers' engineering challenges.**



## PROCESS EXPERTISE

- › With over **60 years' experience in the automotive industry**, Henkel's global team of solution engineers has unparalleled application and process knowledge.
- › **Our team offers dedicated support** to co-develop sustainable production processes that meet large-scale manufacturing requirements.



## EQUIPMENT SUPPORT

- › **Automatic dosing and process monitoring systems** for Henkel surface treatment, cleaner and lubricant solutions enable our customers to execute **more efficient processes.**
- › Henkel-branded solutions alongside partnerships with leading equipment suppliers **deliver broad resources for high-yield manufacturing outcomes.**

*Henkel's technical expertise combined with our market-leading formulations provide end-to-end success across the value chain, from liquid metal to the final component.*





# ENABLING CHEMISTRIES FOR **METAL FORMING**

BONDERITE® lubricants facilitate numerous metal forming applications including **casting, forging and cold forming**, and are **designed to support robust processes with short cycle times and excellent tool life**.

The **innovative PULS technology for cold forming** helps customers significantly **reduce processing time, avoid the use of hazardous material, and extend tool life** – all of which contribute to reduced processing costs.

## **CASTING LUBRICANTS**

*page 10*

## **FORGING LUBRICANTS**

*page 12*

## **COLD-FORMING LUBRICANTS**

*page 13*

## **SUCCESS IS OUR AMBITION**

Henkel technology solutions are designed to create value for our customers, helping them secure a competitive advantage.

## CASTING LUBRICANTS

### Features and Benefits:

- » High wetting temperatures and release properties to reduce cooling time, ensure optimal die protection and enable efficient production rates
- » Concentrated products to reach high dilution ratios up to 300:1; lower cost per part and reduced packing, handling and transport costs
- » Specific formulations to be applied pure or diluted through standard, minimal or micro-spray applications
- » Cleaner surfaces for enhanced performance in painting or bonding applications
- » Low build-up on dies, reducing maintenance operations

BONDERITE®	DILUTION	FEATURES AND BENEFITS
<b>L-CA CP 503 RANGE</b>	140 – 200	Various formulations for structural parts, low-Fe and sticky Al alloys, as well as magnesium casting.
<b>L-CA CP 579N</b>	40 – 120	Low wax product, no build-up, very good release and clean part surfaces.
<b>L-CA CP 747</b>	110 – 160	Particularly suited for heavy, long and thick-walled castings, such as gearboxes and engine blocks.
<b>L-CA CP 780</b>	150 – 250	Particularly suited for heavy, long and thick-walled castings, such as gearboxes and engine blocks.
<b>L-CA CP 786</b>	Ready for use	Oil-based, high-performance lubricant, suitable for micro-spray application.
<b>L-CA 791 L-CA 791C</b>	100 – 160	Low wax product for hot dies and castings with large dimensions. Universal and robust product, offering reduced part porosity over a wide range of temperatures. C-version offers additional biostability and corrosion protection for the die.
<b>L-CA 791N</b>	80 – 200	Highly versatile release agent suitable for almost any type of casting, especially thin-walled castings. Designed for spray application manually or automated.
<b>L-CA CP 794A</b>	150 – 300	Excellent metal flow for large and complex components. Castings on big presses with automatic application, particularly on hot dies. Suitable for heavy section castings.
<b>L-CA CP 794C</b>	150 – 250	High release performance with high shear stability and premium corrosion protection; suitable for heavy, long and thick-walled castings.
<b>L-CA CP 798</b>	40 – 120	High release properties for all types of aluminum parts
<b>L-CA CP 799</b>	40 – 150	Special development for self-curing alloys. No interference with subsequent processes such as bonding, welding and/or painting.
<b>L-CA CP 886</b>	70 – 90	Does not cause heavy build-up on dies, bad smell or stained casting.

BONDERITE®	DILUTION	FEATURES AND BENEFITS
L-CA CP 1002	60 - 160	Wax-free formulation, wide temperature range; suitable for conventional and micro-spray.
L-CA CP 1020N	40 - 120	Oil-wax mixture, very good migrating properties into deep cavities; suitable for a range of casting parts.
L-CA CP 1030N	40 - 120	High release performance and excellent bacteria protection (biostability); suitable for all types of aluminum parts.
L-CA 10020	50 - 150	High release properties and excellent wetting characteristics at high temperatures, resulting in high efficiency.
L-CA 10798	80 - 120	High efficiency lubricant capable of delivering cleaner castings consistently in order to reduce scrap rate and costs.
L-CA 10799	Up to 100	Release agent for pressure die casting of aluminum and magnesium alloys.
L-CA EV2022	No dilution	Oil-based, special development for self-curing alloys. No interference with subsequent processes such as bonding, welding and/or painting.
L-CA 57002	60 - 130	Water-based, wax-free lubricant, suitable for micro-spray application.

\*Please consult with your local Henkel team regarding regional availability of products referenced in this brochure.



# FORGING LUBRICANTS

	BONDERITE®	FEATURES AND BENEFITS
GRAPHITE DISPERSIONS	L-FG F 31 or L-FG 570	Recognized as the industry benchmark. Finest graphite particle size available. Excellent metal flow, productivity and die life. Wide application range for an easy and robust forging process.
	L-FG F 31G	Cost effective water-based graphite lubricant for ferrous forging, particularly suitable for components like crankshafts.
	L-FG F 87	Stable concentrate with low graphite settlement. Fine graphite and binder for faster wetting.
	L-FG F 550	Versatile and reliable forging die lubricant to reduce die wear and optimize material flow in the forging of complex steel parts.
	L-FG F 568	Excellent film formation; state-of-the-art forging die lubricant supplied in concentrated form.
	L-FG F 581C	High-solids forging lubricant, optimized for process cost control.
	L-FG F 592	Ammonia-free, graphite dispersion ensures excellent performance and cost-efficiency.
	L-FG F 658	Ideal for hot forging and extrusion operations. No die cavity build up. Improved part quality and reduced press downtime.
GRAPHITE-FREE, SYNTHETIC FORGING LUBRICANTS	L-FG F 180	Excellent die adhesion, which assists in metal flow and prevents parts from sticking inside the die or to the punch.
	L-FG 497	Broad field for hot forging of ferrous metals on presses and hammers.
	L-FG F 605	Next-generation lubricant for medium- to heavy-duty forgings; promotes a cleaner working environment.
	L-FG 1105M	Recognized as the industry benchmark for non-graphite forging die lubricants. Suitable for a wide range of forging applications.
HEAVY DUTY, EXTRUSION	L-FG F 144/S	Supports extreme metal flow, especially backward extrusion of gas cylinders, rail wheels.
	L-FG F 344/2	Heavy forging, enhanced metal flow, especially well-suited for hot steel extrusion of gas cylinders and rail wheels.
ALUMINUM FORGING LUBRICANTS	L-FG 522	Graphite in oil dispersion for isothermal and non-isothermal forging operations.
	L-FG 593 AL	Water-based lubricant for complex forming operations; has high biostability.
	L-FG 599 AL	Graphite in oil/water emulsion, suited for multi-stage, warm forming of aluminium parts or orbital forging presses.
	OILDAG	Oil-based graphite lubricant, suitable for both ferrous and non-ferrous forging.

# COLD-FORMING LUBRICANTS

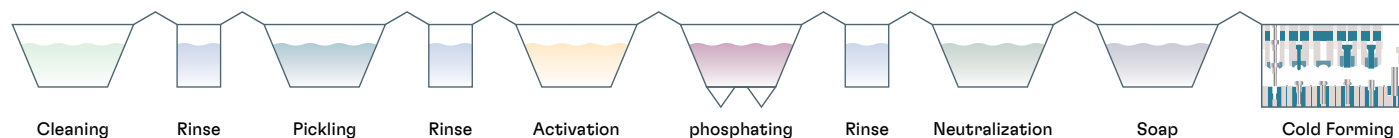
## POLYMER-BASED LUBRICANTS

### Features and Benefits:

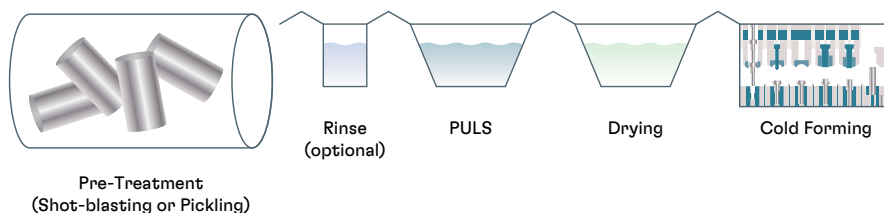
- » Extended tool life
- » No production stops for bath maintenance
- » No disposal of reactive soap & phosphate sludge
- » Lower bath disposal cost
- » Leanest cold forming process in the market

### Process set-up:

#### TRADITIONAL PROCESS: Up to 10 steps



#### PULS\* (POLYMER-BASED LUBRICANT) PROCESS: Reduce number of steps from 10 to 3



	<b>BONDERITE®</b>	<b>Cold Forming Performance</b>	<b>Boron</b>	<b>Zinc Phosphate</b>	<b>Applications</b>	<b>Removability</b>
<b>POLYMER-BASED COLD FORMING LUBRICANTS</b>	<b>L-FM FL 744</b>	Medium	Yes	Yes	Bolts, powertrain, wire, bars	Yes
	<b>L-FM FL 735</b>	High	Yes	Yes	Bolts, wire, bars	Yes
	<b>L-FM FL 835</b>	High	Yes	Yes	Powertrain, bars	Yes
	<b>L-FM FL 623</b>	High	No	No	Tubes, fittings, galvanized wire	No
	<b>L-FM FL 2020</b>	High	No	Yes	Powertrain, bars, fasteners	Yes
	<b>L-FM FL 2021</b>	High	No	Yes	Bolts	Yes

\*Parker Ultimate Lubrication System Licensed Technology from Nihon Parkerizing, Japan

\*Please consult with your local Henkel team regarding regional availability of products referenced.





# SOLUTIONS FOR ***MACHINING AND CLEANING***

**The innovative BONDERITE® line of machining fluids reduces coolant consumption by up to 70%, improves tool life, and ensures part cleanliness.** Prioritizing sustainability, Henkel's portfolio of coolants – including **boron-free solutions** – meets ever-increasing environmental standards.

**Neutral and alkaline cleaners offer temporary corrosion protection, long-term biostability, excellent cleaning performance, and low foaming** – even under high pressure. With an exceptionally broad range of products and chemistry platforms, **Henkel is uniquely positioned to develop customized and highly-efficient cleaning solutions.**

## **MACHINING AND GRINDING FLUIDS**

*page 16*

## **PART CLEANERS**

*page 17*

## **SAFETY IS OUR AMBITION**

Henkel machining, grinding and cleaning fluids deliver best-in-class results, while ensuring worker safety.

# MACHINING AND GRINDING FLUIDS

## Features and Benefits:

- » Best-in-class biostability
- » Up to 50% less consumption
- » Pre-cleaning of Parts
- » Cleaner machines and tools
- » Long sump life
- » High level of corrosion inhibition
- » Long Tool-Life
- » Recycling of C-NE 10640

BONDERITE®	DESCRIPTION	COMPATIBLE WITH
L-MR 21-60	Designed to resist bacterial contamination, extending the life of the fluid. Requires less defoamer due to reduced foaming characteristics.	Copper
L-MR 46-81	Water-soluble synthetic grinding fluid with good foam control, corrosion protection properties & grit setting characteristics	Steel / Cast Iron
L-MR 46-81 HP	Water-soluble synthetic grinding fluid with excellent foam control, corrosion protection properties & grit setting characteristics.	Steel / Cast Iron
L-MR 71-10L 1	Cost effective water-soluble, semi-synthetic grinding fluid with good foam control, corrosion protection properties & grit setting characteristics.	Steel / Cast Iron / AL
L-MR 71-10L 2	Water-soluble, synthetic grinding fluid with excellent foam control, corrosion protection properties, anti-bacterial & grit setting characteristics	Steel / Cast Iron / AL
L-MR 77-4	No addition of bactericides over the lifetime of the emulsion is necessary. Low topping up concentrations reduces product consumption.	Steel / AL
L-MR 10601	Fully synthetic (oil-free) coolant for most applications	Steel / Grey-Cast-Iron / AL
L-MR 11423	Boron- and mineral-oil free general purpose fully synthetic coolant only for grinding	Steel, Cast iron, (AL)
L-MR 11492	Fully synthetic (oil-free) coolant for grinding applications only.	Steel / Cast / Co-Carbide-Steel / (AL)
L-MR 21165	Semi-synthetic for use with non-ferrous applications.	Brass / Copper, Mg / Zn
L-MR 21637	Semi-synthetic with high lubricity for use with sensitive AL-alloys	AL / Steel / Stainless Steel/ Ti
L-MR 21718	Comprehensive semi-synthetic for most applications.	Steel / Grey-Cast-iron / (AL)
L-MR 21909	Semi-synthetic aviation product, 100% VOC-free.	Steel / Stainless Steel / AL / Titanium
L-MR B236	Superb wetting characteristics, excellent tramp oil rejection, suitable for most water conditions.	Steel / AL
L-MR B237	Superb wetting characteristics, excellent tramp oil rejection, suitable for most water conditions	Steel / AL
L-MR B400	High lubricity provides excellent versatility in most applications. Bio-resistant technology eliminates the need for tank-side additives.	Steel / AL
L-MR B637	Bio-resistant, boron-free, semi-synthetic fluid. Stable emulsion over time and across water conditions.	Steel / AL

# PART CLEANERS

## Features and Benefits:

- » Excellent cleaning performance
- » Top corrosion protection
- » Foam-free even under high pressure
- » Extended bath life and less wastewater
- » Sustainable, as recycling of old C-NE 10640 cleaner bath in L-MRs is possible

BONDERITE®	DESCRIPTION	COMPATIBLE WITH	FEATURES
<b>C-NE 270</b>	Neutral spray cleaner (> 20°C), salt-free.	Demulsifying non-ferrous metal cleaner, with lightening properties at AL-alloys	Best before liquid gasketing
<b>C-NE 400</b>	Neutral spray cleaner at low temperatures (> 20°C), salt-free.	All metals	Best temporary corrosion protection for interoperation storage
<b>C-NE 750</b>	Neutral spray cleaner for high and low temperatures (20 to 80°C)	Non-ferrous alloys	Suitable for high pressure process
<b>C-NE 3300</b>	Neutral, high demulsifying spray cleaner (30-60°C)	All metals	Best demulsifying properties for longer bath lifetime
<b>C-NE 5020</b>	Neutral spray cleaner for high and low temperatures (20 to 80°C)	Steel / Cast Iron / AL	Cost effective cleaner
<b>C-NE 5021/5021WH</b>	Neutral spray cleaner for high and low temperatures (20 to 80°C)	Steel / Cast Iron / AL	Suitable for spray & immersion cleaning process
<b>C-NE 5088</b>	Neutral spray cleaner at high temperatures (> 50°C), salt free.	All ferrous alloys	Excellent removal of MQL machining lubricants
<b>C-NE 5225</b>	Neutral spray cleaner for high and low temperatures (35 – 70°C), salt-containing.	Ferrous and aluminum alloys	Best cleaning performance for particles
<b>C-NE 6771</b>	Neutral spray cleaner for high and low temperatures (10 to 80°C)	Steel / Cast Iron	Rust preventative emulsion
<b>C-NE 10330</b>	Neutral spray cleaner after MQL operations. (MQL = Minimum Quantity Lubrication)	All metals (35 – 65°C)	Best cleaning performance when MQL lubricants used before cleaning

\*Please consult with your local Henkel team regarding regional availability of products referenced.

# PART CLEANERS

BONDERITE®	DESCRIPTION	COMPATIBLE WITH	FEATURES
C-NE 10640	Residue- and Boron-free neutral cleaner, with no foam, formulated to through a wide temperature range – ambient to 80°C and for Recycling into L-MR’s instead of wasting	Steel / Cast / AL	Best cleaning performance where residue-free is critical, recycling in L-MR coolants possible
C-NE N	Neutral rust and scale remover (20-70°C)	Ferrous and non-ferrous alloys	Removes scale and rust at low concentrations; cleans and ambient temperature
S-FN 6748	Oil-free cleaner for spray and immersion processes.	Steel / Cast / AL	Water-soluble rust-preventative
S-FN 6748B	Oil-free cleaner for spray and immersion processes.	Steel / Cast / AL	Water-soluble rust-preventative

\*Please consult with your local Henkel team regarding regional availability of products referenced.







# SOLUTIONS FOR ***SURFACE TREATMENT***

**Our surface treatment solutions yield high-end corrosion protection, from classical zinc phosphate to sustainable thin films conversion coatings.**

**Our Thin Film Processes use less energy and reduce both waste and water usage when compared to traditional Zinc Phosphate applications.**

**We offer specialized multi-metal** and applied to aluminum wheels, passivation of battery elements and other multi-metal and light-metal components.

## **RELIABILITY IS OUR AMBITION**

All Henkel solutions are engineered to optimize safety, reliability and efficiency of surface treatment processes.

### **ZINC PHOSPHATE**

*page 22*

### **THIN FILM PROCESS**

*page 23*

### **LIGHT METAL PROCESS**

*page 24*

### **ANODIZING SEALING**

*page 25*

### **MPP PROCESS**

*page 25*

### **LINEGUARDX & LINEGUARD PROCESS CONTROL EQUIPMENT**

*page 26*

## ZINC PHOSPHATE

### Features and Benefits:

- » Highest performance in corrosion protection
- » Suitable for steel, aluminum and galvanized surfaces
- » Low process temperature at 48 – 55°C
- » Up to 20% aluminum content is achievable
- > Full range of neutral descalers and etchants for steel and galvanized substrates

### Key products:

#### **BONDERITE® M-AC AL2000**

- > Liquid-based conditioner with enhanced shelf life and bath life which creates greater process efficiency

#### **Neutral Descaler:**

- » BONDERITE® C-NE N
- » BONDERITE® C-AD N5 additive
- » BONDERITE® C-IC 182

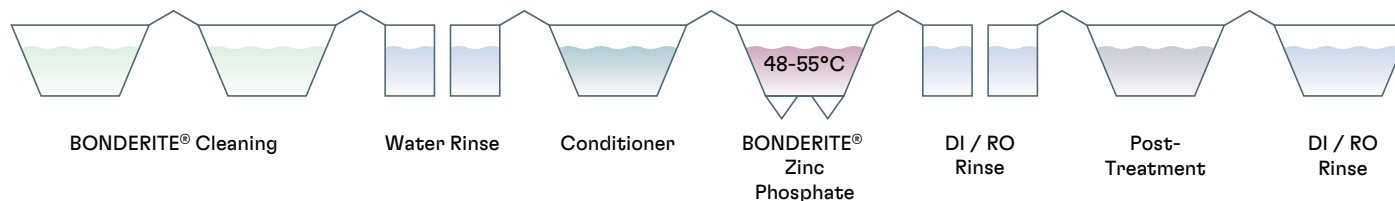
#### **Degreaser:**

- » BONDERITE C-AK 7163
- » BONDERITE C-AK 1022R1 (N&P&B free)
- » BONDERITE C-AK 1563

#### **Surfactant:**

- » BONDERITE C-AD 1020S (RT)
- » BONDERITE C-AD 1560

### Process set-up:



7 key steps – up to 20% aluminum is achievable

\*Please consult with your local Henkel team regarding regional availability of products referenced.





# ZINC PHOSPHATE

## HENKEL FLEX- OR "TWO-STEP"-TECHNOLOGY

### Features and Benefits:

- » Up to 85% aluminum content in the metal mix
- » 50% less hazardous sludge generation
- » Less maintenance, less chemical cleanings
- » 50% less free fluoride usage in phosphate stage
- > Reduced cost from the first m<sup>2</sup> of aluminum in the metal mix

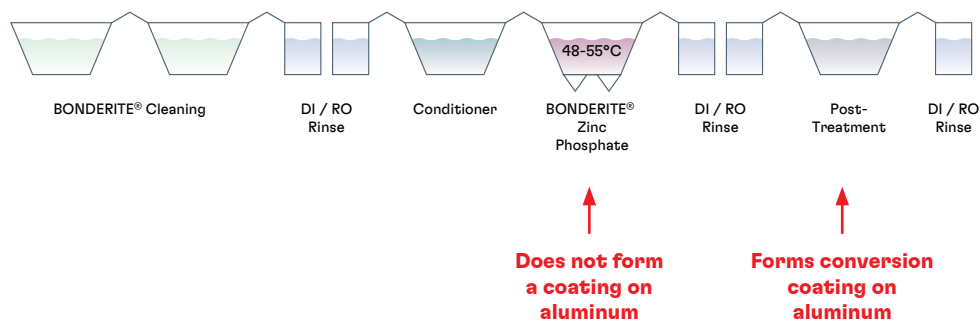
### Key products:

**BONDERITE® M-ZN 958 MU/R**

**BONDERITE® M-ZN 2798**

**BONDERITE® M-ZN 2792**

### Process set-up:



# THIN FILM PROCESS

## HENKEL THIN-FILM TECTALIS PROCESS

### Features and Benefits:

- » Up to 100% aluminum content in the metal mix
- » Free of hazardous heavy metals
- » Ambient temperature processing reduces energy consumption
- » Zero sludge production lowers maintenance resource requirements
- » Facilitates a streamlined process with fewer stages
- » Reduced water use yields less wastewater
- > Suitable for all metals

### Key products:

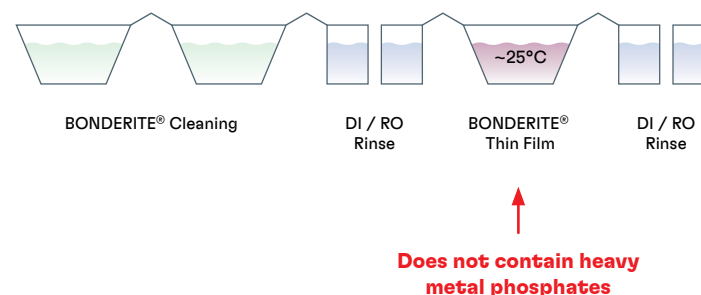
**BONDERITE® M-NT 20121**

**BONDERITE® M-NT 1820**

**BONDERITE® M-NT 1850**

\*Please consult with your local Henkel team regarding regional availability of products referenced.

### Process set-up:



\* Greenfield site



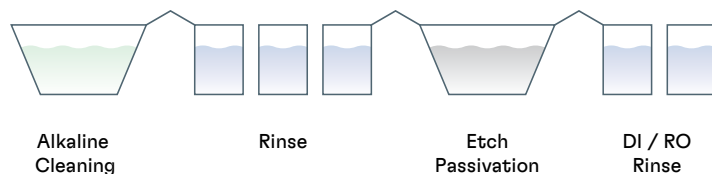
# LIGHT METAL PROCESS

## ETCH PASSIVATION PROCESS

### Features and Benefits:

- » Simple, ultra-short process set-up
- » Etch-passivation of aluminum components
- » Flexible process for cleaning and Ti-based passivation
- » Stable surface conditions and resistance for up to 6 months
- » Excellent welding and adhesive bonding of components, even after extended storage periods
- » OEM-approved

### Process set-up:



### Key products:

#### Degreaser:

- » BONDERITE® C-AK 1563-1
- » BONDERITE® C-AK 5831 ECO
- » BONDERITE® C-AK 14415

#### Surfactant:

- » BONDERITE® C-AD 1270
- » BONDERITE® C-AD 5003
- » BONDERITE® C-AD 1020S (RT)

#### Etch-Passivation:

- » BONDERITE® M-NT 2040 (R2)

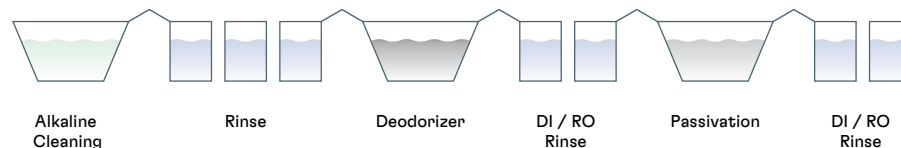
\*Please consult with your local Henkel team regarding regional availability of products referenced.

## LIGHT METAL PASSIVATION PROCESS

### Features and Benefits:

- » Flexible process layout
- » Best-in-class corrosion performance
- » Excellent paint adhesion
- » Robust, easy-to-control process
- » Automated process control and dosing with Henkel Lineguard system
- » Titanium- or Titanium/Zirconium-based + Polymer for adhesion

### Process set-up:



### Key products:

#### Degreaser:

- » BONDERITE® C-AK 1563
- » BONDERITE® C-AK 1563-1 / C-AD 5003
- » BONDERITE® C-AK 5831 ECO
- » BONDERITE® C-AK G414
- » BONDERITE® C-AK G818 (N&P FREE)
- » BONDERITE® C-AK 14415

#### Surfactant:

- » BONDERITE® C-AD 1270
- » BONDERITE® C-AD 5003
- » BONDERITE® C-AS 1020S (RT)

#### Deoxidizer:

- » BONDERITE® C-IC HX-357
- » BONDERITE® M-NT 2040
- » BONDERITE® C-IC 4902

#### Passivation:

- » BONDERITE® M-NT 400
- » BONDERITE® M-NT 4595 R5
- » BONDERITE® M-NT 4595 R5-NT
- » BONDERITE® M-NT 4850-2
- » BONDERITE® M-NT 5200

## ANODIZING SEALING

### TWO-STEP SEALING PROCESS

Unique sealing technology for anodized aluminum protects automotive exterior aluminum parts that are exposed to harsh environments. Typical applications are exterior trim parts and interior decorative elements.

#### Features and Benefits:

- » Improved anti-corrosion performance against alkaline media and as observed in salt spray testing
- » Highly-effective sealing process
- » No impact on anodizing oxide thickness

#### Key products:

##### **BONDERITE® M-ED 11053**

- » Nickel complex used at sealing step 1

##### **BONDERITE® M-ED 11036**

- » Organic polymer used at sealing step 2

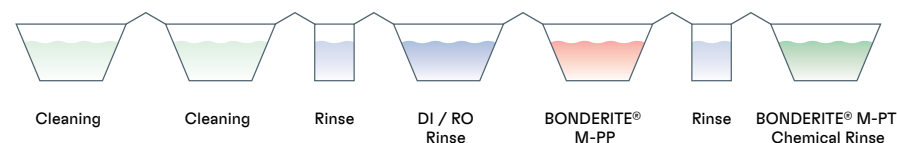
## MPP PROCESS

### AUTOPHORETIC COATING PROCESS

#### Features and Benefits:

- » Low cure temperature for processing of fully-assembled components
- » Flexible and impact-resistant coating
- » Functional UV protection
- » Unlimited throwing power
- » Inside and outside part protection
- » Uniform low-gloss appearance

#### Process set-up:



#### Key products:

##### **BONDERITE® M-PP 930™**

- » Excellent corrosion protection for demanding application such as vehicle frames and chassis parts
- » Co-cure compatible (M-PP-coating and topcoat in ONE oven cure)
- » No application limitation for part size, shape, density or complexity
- » Cure profile at 185 – 210°C

## LINEGUARDX

### SMART MANUFACTURING SYSTEM

BONDERITE® LineguardX is an innovative smart manufacturing execution system (MES) for remote monitoring and predictive maintenance. It can help improve manufacturing operations by allowing better control and continuous monitoring of coating systems.

#### Features and Benefits:

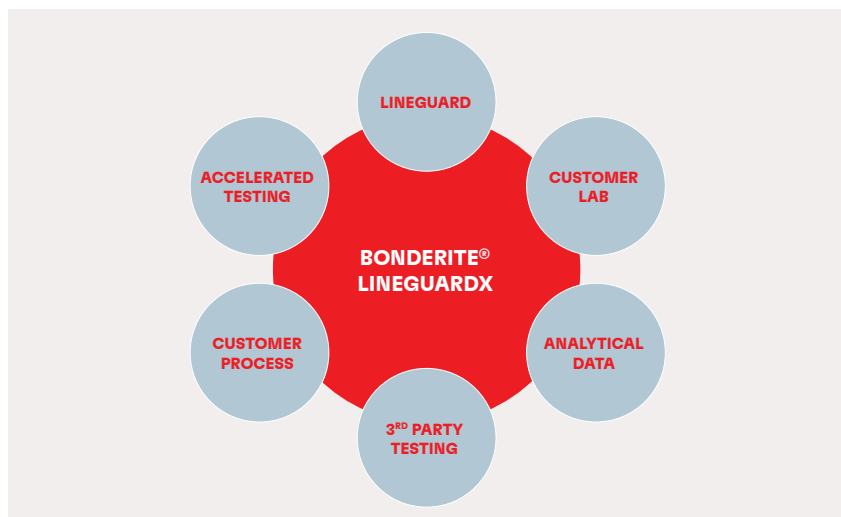
- » Early warning of pending danger
- » Increased quality
- » Reduced scrap rate
- » Reduced downtime
- » Ongoing customer support

## LINEGUARD PROCESS CONTROL EQUIPMENT

Henkel's Lineguard equipment and systems incorporate over 40 years of experience in the design, building, and maintaining of metal treatment operations.

#### Features and Benefits:

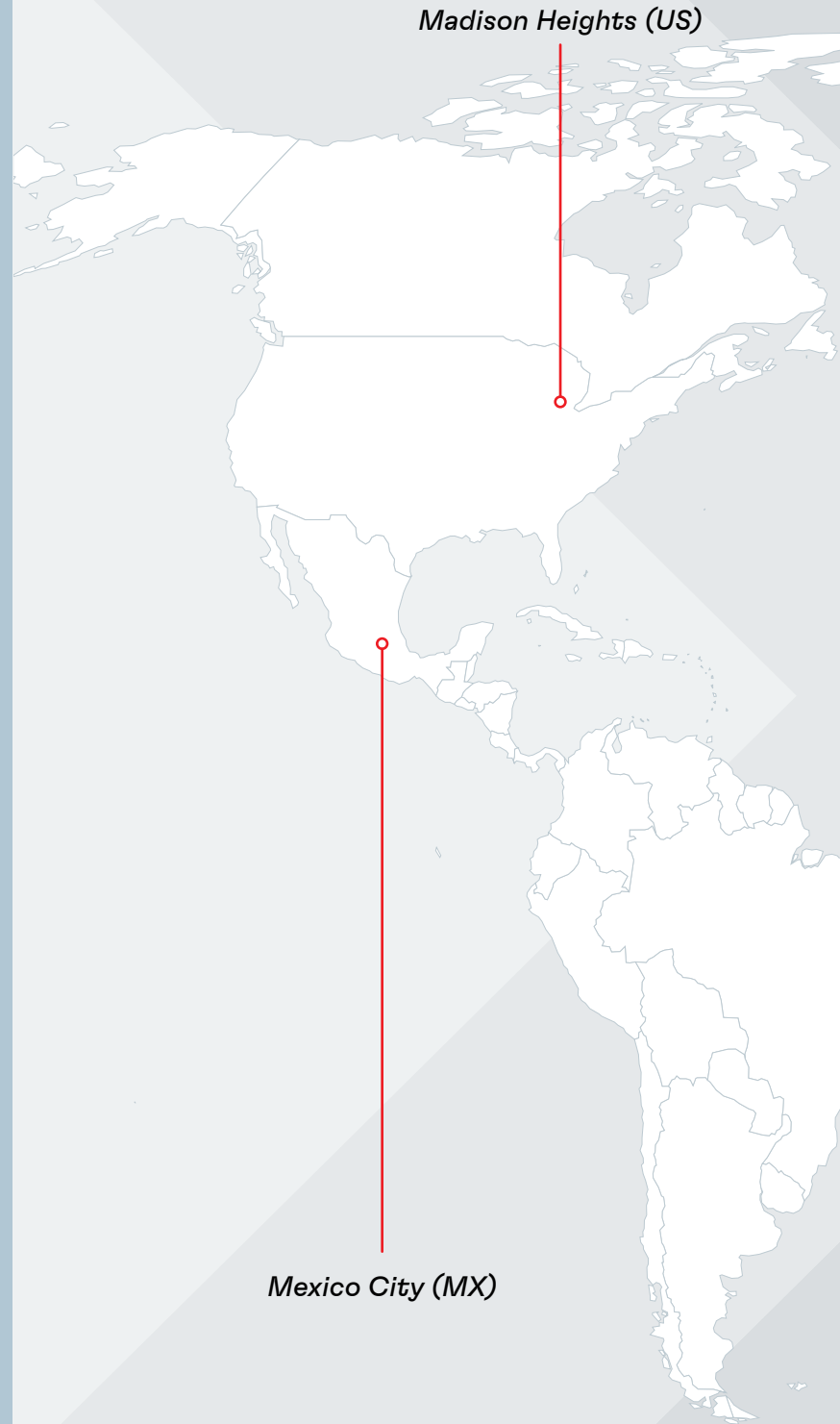
- » Versatile, modular system
- » Automated bath control & product dosing
- » Accurate dosing & enhanced process control
- » Higher process quality
- » Reduced consumption of water & chemicals
- » Data-logging of all relevant bath parameters
- » Ready for IoT 4.0 – remote access and data analysis





# GET IN TOUCH WITH OUR **GLOBAL TEAM OF TECHNOLOGY EXPERTS**

Henkel, your trusted solution partner.





*Düsseldorf (GER)*

*Istanbul (TK)*

*Eumesong (KOR)*

*Isogo (JPN)*

*Shanghai (CHN)*

*Pune (IND)*

*Johannesburg (SA)*

*São Paulo (BRA)*

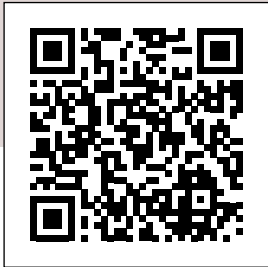


**BONDERITE®**

# *SHAPE, DEFINE, PROTECT* **THE FUTURE**

Automotive Component Processing Solutions

**VISIT US ONLINE**



The information provided herein, especially recommendations for the usage and the application of our products, is based upon our knowledge and experience. Due to different materials used as well as to varying working conditions beyond our control we strictly recommend to carry out intensive trials to test the suitability of our products with regard to the required processes and applications. We do not accept any liability with regard to the above information or with regard to any verbal recommendation, except for cases where we are liable of gross negligence or false intention. The information is protected by copyright. In particular, any reproductions, adaptations, translations, storage and processing in other media, including storage or processing by electronic means, enjoy copyright protection. Any exploitation in whole or in part thereof shall require the prior written consent of Henkel AG & Co. KGaA. Except as otherwise noted, all marks used in this document are trademarks and/or registered trademarks of Henkel and/or its affiliates in the US, Germany, and elsewhere. © Henkel AG & Co. KGaA, DSGN0045088 (06/2025)