Adhesives, Sealants, Functional Coatings, and Services

Rail Sourcebook
HENKEL: YOUR TOTAL SOLUTIONS PROVIDER FOR THE RAIL INDUSTRY

SOLUTIONS FOR EVERY STEP OF YOUR PROCESS

BODY SHOP
METAL
• Metalworking Fluids
• Cleaning
• Corrosion Protection

PAINTING
• Cleaning
• Pre-Treatment
• NVH Solutions
• Underbody Coatings

BODY ASSEMBLY
CAR BODY
• Structural Bonding
• Composite Bonding
• Panel Sealing
• Exterior Panel Bonding

COMPONENTS
• Axel Bonding
• Wheel Assembly

ENGINEERING SERVICES
TESTING
ACOUSTICS LABS
ANALYTICAL SERVICES
More than 30 percent of our sales come from products launched in the past five years.

GLOBAL SUPPLY CHAIN
to maintain a reliable supply of products to our customers.

CUSTOMIZED SOLUTIONS
We can customize our products to fit your exact requirements.

WHY HENKEL?
Henkel will work with you to optimize your manufacturing process, identify improvements, and solve your toughest challenges.

WE’RE YOUR PARTNER EVERY STEP OF THE WAY.

BROAD PRODUCT PORTFOLIO
to provide the optimum solution for your challenges.

CUSTOMER PARTNERSHIP
to help make your designs more reliable and durable, and to help improve your processes.

EQUIPMENT SOLUTIONS
that can be easily integrated into your manufacturing process.

GLOBAL SUPPORT
no matter where in the world you’re located.

INNOVATION
More than 30 percent of our sales come from products launched in the past five years.

COMPREHENSIVE TESTING
10 R&D centers around the world for testing and analysis, staffed by 3,000 design and application professionals.

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Henkel’s global network of engineering and R&D centers is staffed by 3,000 design and application professionals. We offer complete engineering services from application and design support to process optimization, as well as a full array of analytical and testing services.
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YOUR PARTNER IN THE RAIL INDUSTRY

Innovations from Henkel deliver leading high-impact solutions worldwide through a broad technology portfolio – including engineered thermal and light cure acrylic, silicone, epoxy, and polyurethane adhesives, sealants and coatings. With our history and experience in the rail industry, our experts can help you find ways to optimize your manufacturing processes and drive down costs. We can help you reduce weight, increase durability, enhance reliability, and we’re continually developing innovations to help you succeed in the future.

LATEST INNOVATIONS INCLUDE:

**LOCTITE® HYBRID SOLUTIONS**

*LOCTITE®* general-purpose structural adhesives, powered by hybrid adhesive technology, are a breakthrough in structural bonding. They’re formulated to meet the rising demands in assembly design for:

- High performance structural bonding
- Multi-surface structural bonding
- Dissimilar substrate structural bonding
- Low hazard structural adhesives

**LOCTITE® 3D PRINTING SOLUTIONS**

Our materials and equipment are used in post-processing applications in bonding, cleaning, surface coatings, and impregnation. Our post-processing solutions improve printed parts performance.

- Wide range of printing technologies and features including the industry’s first printable silicone
- Partnership with industry leaders in printer development for ever-increasing range of capabilities
- New Advanced Customer Interaction Center in Ireland
HENKEL 3D PRINTING SOLUTIONS

3D PRINTING FOR INDUSTRIAL MANUFACTURING

To accelerate the industrial usage of 3D Printing solutions, Henkel offers a growing portfolio of high-performance adhesives and resins, along with services and equipment. This includes specialized enabling equipment for automation as well as solutions for curing, impregnation, and surface treatment in post-processing. This range of products and services has further strengthened the company’s additive manufacturing ecosystem and accelerates the integration of 3D printed parts into the industrial assembly and supply chain infrastructure.

Open LOCTITE 3D Printing Ecosystem
Portfolio of 3D Printing materials, hardware, and software solutions

Services
End-to-end services for parts production, design and engineering and post-processing

Accessory Equipment
Specialty Equipment solutions to enable more automated 3D mass production, e.g., Dispensing, Curing

Customized Materials
Improved and customized materials based on broad polymer technology portfolio

Printer Solutions
Best-in-class printer solutions from our Ecosystem Partners

Accessory Equipment
Specialty Equipment solutions to enable more automated 3D mass production, e.g., Dispensing, Curing

Customized Materials
Improved and customized materials based on broad polymer technology portfolio
APPLICATIONS

APPLICATION CATEGORIES

1. ANTI-GRAFFITI
2. ANTI-SLIP COATINGS
3. CABLE SEALING
4. COMPOSITE BONDING
5. FLOOR COVER BONDING
6. FLOOR PANEL BONDING
7. GENERAL SEALING
8. INSULATION BONDING
9. NVH
10. POTTING
11. PROTECTIVE COATINGS
12. STRUCTURAL BONDING
13. THREADLOCKING
14. WINDOW BONDING AND SEALING
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11. PROTECTIVE COATINGS
12. STRUCTURAL BONDING
13. THREADLOCKING
14. WINDOW BONDING AND SEALING

▲ SUBWAY / UNDERGROUND

▲ TRAMWAY / STREETCAR
APPLICATIONS

APPLICATION CATEGORIES
1. CLEANING AND METAL PRE-TREATMENT
2. THREADLOCKING, THREAD SEALING, GASKETING, RETAINING
3. PROTECTIVE COATING
4. TRAIN WASH CLEANERS
5. ANTI-SEIZE AND LUBRICANTS
6. PROTECTIVE COATINGS

BOGIE

DIESEL ENGINE
APPLICATION CATEGORIES

1. CLEANING AND METAL PRE-TREATMENT
2. THREADLOCKING, THREAD SEALING, GASKETING, RETAINING
3. PROTECTIVE COATING
4. TRAIN WASH CLEANERS
5. ANTI-SEIZE AND LUBRICANTS
6. PROTECTIVE COATINGS

- REMANUFACTURING CLEANER
- VEHICLE WASH SOLUTIONS
FUNCTIONAL COATINGS

BONDERITE®
THE RIGHT SOLUTION FOR EVERY SURFACE CLEANING PROCESS REQUIREMENT

Henkel supplies a broad portfolio of BONDERITE® cleaners that help metal processors increase efficiency and lower operating costs. BONDERITE cleaners are simple and efficient to use while significantly improving users’ environmental sustainability. A complete range of alkaline, neutral, and acidic cleaners ensures that there is a BONDERITE product for every cleaning requirement in four main categories: industrial and specialty, operational maintenance, new part cleaning and conversion, as well as remanufacturing.
BONDERITE® - INDUSTRIAL AND MAINTENANCE CLEANERS

BONDERITE® industrial and maintenance cleaners represent the highest efficiency and sustainability in industrial cleaning. Thanks to a wide range of alkaline, neutral, and acid cleaners, plus our field and laboratory services around the globe, you can be sure of the perfect solution for your cleaning needs.

WHY HENKEL BONDERITE

- Wide portfolio of alkaline, neutral, and acidic cleaning products that meet all application requirements
- 90 years of Henkel experience helping customers optimize their process and select the most appropriate products
- Ongoing research and product development efforts allow Henkel to be an industry leader in new technology
- Rigorous product testing in Henkel’s own R&D centers
- High level product and process analysis ensuring that customers are always following best practices
- Henkel service values shared throughout the organization with customer service at their core

THE RIGHT SOLUTION FOR EVERY CLEANING

Parts cleaning and metal pre-treatment cleaning:
Neutral, acidic, and alkaline cleaners for spray and immersion for cleaning as a pre-treatment prior to subsequent surface treatments, as well as interoperational cleaners after cutting, grinding, drilling, and honing

Maintenance cleaners:
Degreasers, vehicle cleaners, descalers, graffiti removers, paint strippers, hand cleaners, floor cleaners, parts cleaners, high pressure cleaners, ultrasonic cleaners, defoamers

Services:
Field tech service, laboratory analytical services, customer-specific product development
MAINTENANCE CLEANERS

One of the most important aspects of keeping rail vehicles rolling is keeping them clean. Henkel offers solutions that meet the day-to-day cleaning demands of the rail industry.

### EXTERIOR CLEANERS

<table>
<thead>
<tr>
<th>PRODUCT NAME</th>
<th>AP</th>
<th>EU</th>
<th>NA</th>
<th>HOW TO APPLY</th>
<th>PH</th>
<th>FEATURES</th>
<th>USES</th>
</tr>
</thead>
<tbody>
<tr>
<td>BONDERITE C-MC 3000</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray, Brush</td>
<td>Alkaline</td>
<td>Excellent general-purpose cleaner; foams to stay on vertical surfaces. Applied at room temperature up to 80°C.</td>
<td>Heavy oil, grease, dust, carbon, flash rust</td>
</tr>
<tr>
<td>BONDERITE C-MC 12300</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td>Spray, Brush</td>
<td>Neutral</td>
<td>Universal liquid cleaner for interior surfaces. Good for soil removal, and has small foaming effect. Ambient temperature application.</td>
<td>Dust and greasy indoor dirt</td>
</tr>
<tr>
<td>BONDERITE C-MC 30112</td>
<td>✔</td>
<td></td>
<td></td>
<td>Spray</td>
<td>Alkaline</td>
<td>Lower pH than competition allows for longer exposure without affecting paint job. Sticks to surfaces to better dissolve soils.</td>
<td>Insect removal from paint and windscreens</td>
</tr>
<tr>
<td>BONDERITE C-MC ACD-1166</td>
<td>✔</td>
<td></td>
<td></td>
<td>Spray, Brush</td>
<td>Acid</td>
<td>Acidic cleaner for automatic applications. Free of oxalic acid; works with hard water.</td>
<td>Iron and copper oxides, brake dust, mineral soiled, light organic dirt</td>
</tr>
<tr>
<td>BONDERITE C-MC GEL-7</td>
<td>✔</td>
<td></td>
<td></td>
<td>Brush, Wipe</td>
<td>Alkaline</td>
<td>Heavy-duty cleaner. Applicable on vertical and upside down surfaces.</td>
<td>Bogie cleaning</td>
</tr>
<tr>
<td>BONDERITE C-MC N DB</td>
<td>✔</td>
<td></td>
<td></td>
<td>Spray, Brush</td>
<td>Neutral</td>
<td>Safe and easy-to-use neutral cleaner. Suitable for automatic cleaning lines. Applied at room temperature (up to 50°C).</td>
<td>Oil, brake dust, carbon, environmental dirt</td>
</tr>
</tbody>
</table>

### GRAFFITI REMOVERS

<table>
<thead>
<tr>
<th>PRODUCT NAME</th>
<th>AP</th>
<th>EU</th>
<th>NA</th>
<th>HOW TO APPLY</th>
<th>PH</th>
<th>FEATURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>BONDERITE C-MC 245</td>
<td>✔</td>
<td></td>
<td></td>
<td>Brush, Wipe</td>
<td>Alkaline</td>
<td>Designed to completely remove graffiti ink shadow after cleaning processes.</td>
</tr>
<tr>
<td>BONDERITE C-MC 400</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td>Brush</td>
<td>Acid</td>
<td>Removal of external graffiti, available in 3 different viscosities, designed for manual cleaning, should be applied above 5°C.</td>
</tr>
<tr>
<td>BONDERITE S-ST 1302</td>
<td>✔</td>
<td></td>
<td></td>
<td>Spray, Brush</td>
<td>Alkaline</td>
<td>For removal of interior graffiti, great EH&amp;S ratings, requires room temperature application.</td>
</tr>
</tbody>
</table>

### PAINT GUN CLEANERS

<table>
<thead>
<tr>
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<th>NA</th>
<th>HOW TO APPLY</th>
<th>PH</th>
<th>FEATURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>BONDERITE C-MC 21130</td>
<td>✔</td>
<td></td>
<td></td>
<td>Spray, Immersion</td>
<td>N/A</td>
<td>Paint gun cleaner for solvent-based and water-based paints.</td>
</tr>
<tr>
<td>BONDERITE C-SO-283</td>
<td>✔</td>
<td></td>
<td></td>
<td>Spray, Immersion</td>
<td>N/A</td>
<td>Organic solvent paint gun cleaner for cleaning solvent-borne paint application equipment and metal surfaces.</td>
</tr>
</tbody>
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### PART CLEANERS

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<thead>
<tr>
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<tbody>
<tr>
<td>BONDERITE C-MC 90014</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td>Manual</td>
<td>Alkaline</td>
<td>Parts cleaner to replace solvents.</td>
</tr>
</tbody>
</table>

*Product highlighted = GO TO product*
NEW PART CLEANING AND CONVERSION COATINGS

PRODUCTS FOR METAL PRE-TREATMENT – CONVERSION COATING CLEANERS AND CONVERSION COATINGS

*Bonderite®* offers conversion coating cleaners and conversion coatings that can increase corrosion protection, adhesion, and performance of a substrate.

### METAL PRE-TREATMENT: CONVERSION COATING CLEANERS

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<th>NA</th>
<th>How to Apply</th>
<th>PH</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bonderite C-AD 0470</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td>Immersion</td>
<td>N/A</td>
<td>Cleaning booster for immersion processes</td>
</tr>
<tr>
<td>Bonderite C-AD 5003</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td>Spray</td>
<td>N/A</td>
<td>Cleaning booster for spray processes</td>
</tr>
<tr>
<td>Bonderite C-AK 1574</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray, Immersion</td>
<td>Alkaline</td>
<td>Multi-metal cleaner, low foam</td>
</tr>
<tr>
<td>Bonderite C-S0 263</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td>Pre-Saturated Wipes</td>
<td>N/A</td>
<td>Manual Application</td>
</tr>
</tbody>
</table>

### METAL PRE-TREATMENT: CONVERSION COATINGS

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<tbody>
<tr>
<td>Bonderite M-CR 65000</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray, Immersion</td>
<td>Acid</td>
<td>Steel, galvanized steel, aluminum, based on trivalent chromium, with mil spec approval</td>
</tr>
<tr>
<td>Bonderite M-FE 700</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray, Immersion</td>
<td>Acid</td>
<td>Iron phosphate cleaner and coating for steel, low temperature cure 30°C, heavy-duty</td>
</tr>
<tr>
<td>Bonderite M-FE-500LT</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray, Immersion</td>
<td>Acid</td>
<td>Iron phosphate cleaner and coating for steel, low temperature cure 30°C, light-to-medium-duty</td>
</tr>
<tr>
<td>Bonderite M-NT 1200</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray</td>
<td>Acid</td>
<td>Phosphate-free substitute for zinc phosphating for steel, galvanized steel, or aluminum 2-component</td>
</tr>
<tr>
<td>Bonderite M-NT 1455-W</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Pre-Saturated Wipes</td>
<td>Acid</td>
<td>Manual application for multi-metals, chrome-free</td>
</tr>
<tr>
<td>Bonderite M-NT 1800</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Immersion</td>
<td>Acid</td>
<td>Phosphate-free substitute for zinc phosphating for steel, galvanized steel, or aluminum 2-component</td>
</tr>
<tr>
<td>Bonderite M-NT 2</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray</td>
<td>Acid</td>
<td>Offers improved corrosion resistance and can be used for steel, galvanized steel, and aluminum 1-component</td>
</tr>
<tr>
<td>Bonderite M-NT 30002</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray</td>
<td>Acid</td>
<td>Used on steel, galvanized steel, and aluminum based on trivalent chromium</td>
</tr>
<tr>
<td>Bonderite M-NT 40043</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray</td>
<td>Acid</td>
<td>Cleaner-coater, zirconium-based chemical conversion for steel, galvanized steel, and aluminum</td>
</tr>
<tr>
<td>Bonderite M-NT 5700-W</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Pre-Saturated Wipes</td>
<td>Acid</td>
<td>Manual application for aluminum only, passes AAMA specs, chrome-free</td>
</tr>
<tr>
<td>Bonderite M-NT 701/M-NT 41042</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray, Immersion</td>
<td>Acid</td>
<td>Cleaner-coater</td>
</tr>
<tr>
<td>Bonderite M-PP 866</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Immersion</td>
<td>Acid</td>
<td>Flexible PVDC-coating, light-to-medium-duty interior applications, cure before top coating</td>
</tr>
<tr>
<td>Bonderite M-PP 930</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Immersion</td>
<td>Acid</td>
<td>Hard epoxy-acrylic coating, ideal for harsh environments and tubular structures, can be co-cured with paint</td>
</tr>
<tr>
<td>Bonderite M-ZN 3410</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray, Immersion</td>
<td>Acid</td>
<td>Robust, easy-to-use, recommended GO TO product</td>
</tr>
<tr>
<td>Bonderite M-ZN 952/958</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray, Immersion</td>
<td>Acid</td>
<td>For creating tricaticonic zinc phosphate coating; compatible with most metals</td>
</tr>
</tbody>
</table>

*Product highlighted = GO TO product*
PRODUCTS FOR DERUSTING AND DESCALING

Incoming materials in rail often have mill scale and require removal of flash rust. Henkel offers derusting and descaling products that will remove soil, rust, and scale prior to conversion coatings – ultimately optimizing cost and labor.

<table>
<thead>
<tr>
<th>DERUSTING AND DESCALING PRODUCTS</th>
<th>AP</th>
<th>EU</th>
<th>NA</th>
<th>HOW TO APPLY</th>
<th>PH</th>
<th>FEATURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>BONDERITE C-AK 359</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray</td>
<td>Alkaline</td>
<td>Multi-metal degreaser; mild foaming</td>
</tr>
<tr>
<td>BONDERITE C-AK 5800</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray</td>
<td>Alkaline</td>
<td>Cleaner for steel and plastic</td>
</tr>
<tr>
<td>BONDERITE C-AK LNS</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spraying or High Pressure</td>
<td>Alkaline</td>
<td>Cleaner for aluminum</td>
</tr>
<tr>
<td>BONDERITE C-IC 172</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Derusting and Descaling (Prior to Conversion Coatings)</td>
<td>Acid</td>
<td>Phosphoric acid pickling product for steel</td>
</tr>
<tr>
<td>BONDERITE C-IC 182 C</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray, Immersion</td>
<td>Acid</td>
<td>Inhibited phosphoric acid pickling product for steel</td>
</tr>
<tr>
<td>BONDERITE C-IC NP 7300</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray, Immersion</td>
<td>Acid</td>
<td>Sulphuric acid pickling product for steel</td>
</tr>
<tr>
<td>BONDERITE C-MC 80</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spraying or High Pressure</td>
<td>Alkaline</td>
<td>Cleaner for steel and non-ferrous metals (light metals should be tested for compatibility)</td>
</tr>
<tr>
<td>BONDERITE C-NE 3300</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Immersion</td>
<td>Neutral</td>
<td>Universal neutral degreaser</td>
</tr>
<tr>
<td>BONDERITE C-NE 5088</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray</td>
<td>Neutral</td>
<td>Heavy-duty neutral degreaser; very robust chemistry; solvent-free</td>
</tr>
<tr>
<td>LOCTITE SF 7063</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Wiping, Immersion</td>
<td>Neutral</td>
<td>Maintenance shop use</td>
</tr>
<tr>
<td>LOCTITE SF 7070</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Wiping, Immersion</td>
<td>Neutral</td>
<td>Maintenance shop use</td>
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</tbody>
</table>

PRODUCT NAME = GO TO product

TEMPORARY CORROSION PROTECTION

Rust preventatives should be used in any area with more than 40% humidity in order to prevent metals from flash rusting.

<table>
<thead>
<tr>
<th>TEMPORARY CORROSION PROTECTION PRODUCTS</th>
<th>AP</th>
<th>EU</th>
<th>NA</th>
<th>HOW TO APPLY</th>
<th>PH</th>
<th>FEATURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>BONDERITE S-FN 7400</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray, Immersion</td>
<td>Alkaline</td>
<td>Steel and cast iron, can be painted over; 1 day of protection</td>
</tr>
<tr>
<td>BONDERITE C-NE 3300</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray, Immersion</td>
<td>Neutral</td>
<td>Multi-metal, protection and cleaner, 1-3 days of protection</td>
</tr>
<tr>
<td>BONDERITE S-PR 6776</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray, Immersion</td>
<td>Neutral</td>
<td>Multi-metal 1-6 weeks of protection</td>
</tr>
<tr>
<td>BONDERITE S-PR 3</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray, Immersion</td>
<td>N/A</td>
<td>Steel and cast iron, oil-based product, 3-6 months of protection</td>
</tr>
<tr>
<td>BONDERITE L-GP 5800</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray, Immersion</td>
<td>Alkaline</td>
<td>All metals, water-based emulsion, 1-6 weeks of protection</td>
</tr>
<tr>
<td>BONDERITE L-GP 4141</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray, Immersion</td>
<td>N/A</td>
<td>Steel and cast iron protection, oil-based, 3-6 months of protection</td>
</tr>
<tr>
<td>BONDERITE S-FN 503</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray, Immersion</td>
<td>Alkaline</td>
<td>Steel and cast iron protection, can be painted over; 1 day of protection</td>
</tr>
<tr>
<td>BONDERITE O-PC 100</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray, Immersion</td>
<td>N/A</td>
<td>Water-based PVDC-coating</td>
</tr>
<tr>
<td>BONDERITE O-PC 700</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray, Immersion</td>
<td>N/A</td>
<td>Water-based Alkyd-coating</td>
</tr>
<tr>
<td>BONDERITE O-PC 528 RFU</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray, Immersion</td>
<td>N/A</td>
<td>Solvent-based PVB-epoxy phenolic primer</td>
</tr>
</tbody>
</table>
**REMANUFACTURING PRODUCTS**

**PRODUCTS FOR REMANUFACTURING**

Henkel offers degreasers, derusting/descaling products, deoxidizing and decarbonizing products, cleaners and paint strippers – all formulated for remanufacturing. Henkel’s chemistries are formulated to be robust, strong, and aggressive enough to cut through heavy grease, oils, and paint coatings.

### DEGREASING PRODUCTS

<table>
<thead>
<tr>
<th>PRODUCT NAME</th>
<th>AP</th>
<th>EU</th>
<th>NA</th>
<th>HOW TO APPLY</th>
<th>PH</th>
<th>FEATURES</th>
<th>STEEL</th>
<th>ALUMINUM</th>
<th>GALVANIZED</th>
<th>PLASTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>BONDERITE® C-AK 1574 MRO</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Immersion</td>
<td>Alkaline</td>
<td>One-step degreasing, derusting, and paint stripping of steel</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE C-AK 5520</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray</td>
<td>Alkaline</td>
<td>Steel and nonferrous metals degreasing</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE C-AK RM-21</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Immersion</td>
<td>Alkaline</td>
<td>One-step degreasing, derusting, and paint stripping of steel</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE C-MC 3000</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray and foam, Manual</td>
<td>Alkaline</td>
<td>Steel and plastic degreasing</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE C-MC 35020</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Immersion</td>
<td>Neutral</td>
<td>For large applications such as vessels, machines, and tanks</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE C-NE 175</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Immersion</td>
<td>Neutral</td>
<td>Multi-metal and plastic degreasing</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE C-NE 5175</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Immersion</td>
<td>Neutral</td>
<td>Contains some rust preventative</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE C-NE 5220-1</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray (low pressure)</td>
<td>Neutral</td>
<td>Multi-metal degreasing</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE C-SO 283</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Hand (wipe)</td>
<td>Neutral</td>
<td>Fast drying, blended solvent. Verify plastic compatibility before use.</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
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### STEEL DERUSTING/DESCALING PRODUCTS

<table>
<thead>
<tr>
<th>PRODUCT NAME</th>
<th>AP</th>
<th>EU</th>
<th>NA</th>
<th>HOW TO APPLY</th>
<th>PH</th>
<th>FEATURES</th>
<th>STEEL</th>
<th>ALUMINUM</th>
<th>GALVANIZED</th>
<th>PLASTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>BONDERITE C-AK 1574 MRO</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Immersion</td>
<td>Alkaline</td>
<td>One-step degreasing, derusting, and paint stripping</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE C-AK 338</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Immersion</td>
<td>Alkaline</td>
<td>Powdered, use on steel, galvanized steel, and aluminum</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE C-AK RM-21</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Immersion</td>
<td>Alkaline</td>
<td>One-step degreasing, derusting, and paint stripping</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE C-IC 182C</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray, immersion</td>
<td>Acid</td>
<td>Phosphoric acid pickling for steel</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE C-IC 3502</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Immersion</td>
<td>Acid</td>
<td>Pickling and derusting of iron and steel</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE C-IC NP 7300</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Immersion</td>
<td>Acid</td>
<td>Sulphuric acid, phosphate-free pickling for steel</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<tr>
<td>BONDERITE C-MC LAVOXYD</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray, immersion, Manual</td>
<td>Acid</td>
<td>Exterior train and tanker wash</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE C-NE 90200</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Immersion, spray</td>
<td>Neutral</td>
<td>Neutral and phosphate-free derusting</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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</tbody>
</table>

### ALUMINUM CLEANING AND DEOXIDIZING PRODUCTS

<table>
<thead>
<tr>
<th>PRODUCT NAME</th>
<th>AP</th>
<th>EU</th>
<th>NA</th>
<th>HOW TO APPLY</th>
<th>PH</th>
<th>FEATURES</th>
<th>STEEL</th>
<th>ALUMINUM</th>
<th>GALVANIZED</th>
<th>PLASTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>BONDERITE C-IC 172I</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Spray, immersion</td>
<td>Acid</td>
<td>Aluminum only</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE C-IC 3012</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Immersion</td>
<td>Acid</td>
<td>Cleaner and paint stripper in one (Use with S-ST 3012MM)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE C-IC 457</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Immersion</td>
<td>Acid</td>
<td>Aluminum only</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE C-MC 11110</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Immersion</td>
<td>Acid</td>
<td>Multi-metal including aluminum</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE S-ST 3012MM</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Immersion</td>
<td>Acid</td>
<td>Cleaner and paint stripper in one (Use with C-IC 3012)</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE S-ST 6776 LO AERO</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Immersion</td>
<td>N/A</td>
<td>Multi-metal cleaner (includes aluminum) with paint stripping ability</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
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<td>DECARBONIZING PRODUCTS</td>
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<tr>
<td>PRODUCT NAME</td>
<td>AP</td>
<td>EU</td>
<td>NA</td>
<td>HOW TO APPLY</td>
<td>PH</td>
<td>FEATURES</td>
<td>STEEL</td>
<td>ALUMINUM</td>
<td>GALVANIZED</td>
<td></td>
</tr>
<tr>
<td>BONDERITE C-AK 1574 MRO</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Immersion</td>
<td>Alkaline</td>
<td>Strong alkaline degreasing, derusting and decarbonizing of steel</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>BONDERITE C-AK 5948 DPM THICK</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Brush or spray</td>
<td>Alkaline</td>
<td>Clings to surfaces to degrease aluminum without harming paints</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>BONDERITE C-AK 9045-6 AERO</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Immersion</td>
<td>Alkaline</td>
<td>Water-based carbon remover</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>BONDERITE C-AK RM-21</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Immersion</td>
<td>Alkaline</td>
<td>Degreasing, derusting and paint stripping</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>BONDERITE C-MC GEL-7</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Brush or spray</td>
<td>Alkaline</td>
<td>Decarbonizing of aluminum</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PAINT STRIPPING PRODUCTS</th>
<th>USES</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRODUCT NAME</td>
<td>AP</td>
</tr>
<tr>
<td>BONDERITE C-AK RM21</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE S-AD 201</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE S-AD-18</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE S-AD-21</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE S-ST 3000</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE S-ST 301</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE S-ST 3012MM</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE S-ST 65</td>
<td>✔</td>
</tr>
<tr>
<td>▶ BONDERITE S-ST 6776 THIN</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE S-ST 6776 LO AERO</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE S-ST 9210</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE S-ST 99 A</td>
<td>✔</td>
</tr>
<tr>
<td>BONDERITE S-ST HOT 50</td>
<td>✔</td>
</tr>
</tbody>
</table>
ASSEMBLY SOLUTIONS

FASTER AND LOWER-COST ASSEMBLY WITH MORE DESIGN CHOICES

From structural bonding to seam sealing and window glazing, we provide a complete range of technologies that allow you to reduce or replace traditional mechanical fastening and sealing methods in a variety of assembly applications.

Bonded joints eliminate the cost of mechanical fasteners and welds, and allow dissimilar materials to be joined. These bonded joints distribute load more evenly allowing lighter gauge materials with tighter tolerances to be used. Replacing welds, rivets, and bolts also helps manufacturers eliminate leaks and reduce warranty claims. The end result is stronger, lighter, more economical vehicles with increased performance.
STRUCTURAL BONDING
– PANELS, WALLS, ROOFS, FLOORS

FROM WELD AND FASTENER REDUCTION TO ASSEMBLY OF DISSIMILAR SUBSTRATES

FOR USE BETWEEN FLEXIBLE SHEET METALS, RIGID CASTINGS/EXTRUSIONS, AND/OR COMPOSITE/PLASTIC MATERIALS

Primarily designed to replace welds, rivets, and other mechanical fasteners in the body, paint or trim shops, our wide range of high strength structural adhesives enable the assembly of non-metallic substrates and open new perspectives of lightweight designs.

The distributed load an adhesive provides versus the stress concentrations of mechanical fastening allows thinner, lower weight panels to be implemented – ultimately reducing weight.

WHY USE A STRUCTURAL ADHESIVE?

• Increase strength
• Seal, bond, and protect in one step
• Noise, vibration, harshness (NVH) damping
• Prevent corrosion
• Improve aesthetics
• Simplify designs
• Improve part performance
• Join dissimilar substrates
• Distribute stress evenly
• Reduce assembly time
• Reduce water leaks

WHERE TO USE A STRUCTURAL ADHESIVE:

• Skin to frame assembly
• Door and panel stiffener attachment
• Bracket attachment
• Plastic and composite components
• Aluminum and stainless components

DIFFERENT JOINT METHODS LEAD TO DIFFERENT STRESS DISTRIBUTION:

Bonding
- Even stress distribution
- Distribution over a large area

Welding
- Uneven stress distribution
- Concentration within small welding line
- Heat distorting of substrate

Spot Welding
- Produces read-through, (dimples on surface)
- Very irregular stress distribution
- Stress concentration at holes

Huck Bolts / Rivets / Bolting
- Very irregular stress distribution
- Stress concentration at holes
- Water ingress route
## STRUCTURAL ADHESIVE SOLUTIONS

<table>
<thead>
<tr>
<th>TECHNOLOGY</th>
<th>PRIMARY USES</th>
<th>ADVANTAGES</th>
<th>CONSIDERATIONS</th>
</tr>
</thead>
</table>
| Silane Modified Polymers (SMPs) | For plastic and treated/painted sheet metal where fatigue resistance, weather resistance, and elastic bonding are needed | • Primerless adhesion to most substrates  
• Excellent anti-flutter material  
• Great UV stability  
• No solvent, isocyanates or silicone  
• Good paintability after cure up to 3 days | • Poor adhesion on oily metal  
• Maximum temperature resistance  
• Low cohesive strength  
• Slow fixture and cure speed  
• Moisture-sensitive |
| Polyurethanes (PU) | For plastic and treated/painted sheet metal parts where fatigue resistance and elastic bonding are needed | • Excellent flexibility  
• Great for noise and vibration reduction  
• Great adhesion on plastics and painted metal  
• Great on dissimilar materials  
• Excellent paintability after cure up to 7 days | • Limited temperature resistance (1 hr. at 140°C/284°F)  
• Poor adhesion to bare and oily metal  
• Poor corrosion resistance  
• Contains isocyanates  
• Moisture-sensitive before cure  
• Multi-step surface preparation |
| Two-Part (2k) Acrylics | For a wide range of substrates including oily metal in body and trim shops where high cleavage and strength are required | • Excellent adhesion on plastic and metal  
• High peel and impact resistance  
• Excellent oily surface adhesion  
• Good corrosion resistance  
• High heat resistance (30 minutes at 200°C/428°F) | • Requires mixing and/or fixturing  
• Refrigerated storage  
• Strong odor (MMA) Modified Methacrylate Acrylics  
• Not weld-through capable (flammable)  
• May create read-through on thin metals |
| Two-Part (2k) Epoxies | For metal in body shops where high cleavage and strength are required | • High shear and impact strength on metal  
• Oily surface adhesion (heat cure)  
• Excellent moisture resistance  
• Excellent heat resistance (up to 1 hour at 220°C/428°F)  
• Weld-through compatible | • Slow fixture/cure times (2k)  
• Requires mixing and/or fixturing during cure  
• Poor elongation and damping  
• Below average oil tolerance  
• Poor adhesion to plastics |
| Two-Step Acrylics | For a wide range of substrates in body and paint shops where rapid on-demand fixturing is needed | • No mixing, cure on-demand  
• Good corrosion resistance  
• High strength on wide range of substrates  
• Light oily surface adhesion  
• High heat resistance (30 minutes at 200°C/428°F) | • Activator may contain solvents  
• Resin has moderate odor  
• Low cure-through depth, ~1 mm  
• Fillets remain uncured  
• Not weld-through capable |
| One-Part (1k) Epoxy | For sheet metal in body and paint shop applications as a flexible anti-flutter material as well as primary structure bonding to replace welds and other joining methods | • Wide range of expansions (0 to >1000%)  
• Good adhesion on oily metal  
• Weld-through capable  
• Unlimited open time; weld-through capable  
• High toughness and peel strength  
• Excellent washout resistance | • Limited to hidden/non-visible joints  
• Requires heat to cure  
• Can be induction or thermal cured |
BONDING AND SEALING WINDOWS / ELASTOMERIC BONDING

Designed to bond windscreens and side windows to the train body, our wide range of window bonding adhesives simplifies and improves the assembly process while improving torsional stiffness and vehicle safety.

WHY USE AN ELASTOMERIC STRUCTURAL PRODUCT?

- Seal in/out heat, liquids, solids, and gases (e.g., moisture, dirt, and exhaust)
- Improve safety, aesthetics, and drag
- Airtight seal results in improved noise, vibration, and harshness (NVH) enhancements
- Higher strength for increased glass retention

WHERE TO USE AN ELASTOMERIC STRUCTURAL PRODUCT:

- Bonding and sealing windscreens
- Bonding of floor panels
- Sealing between panes of glass
- Stationary windows and sunroofs
- Backfilling large gaps and voids
- Bonding headliner and upholstery

MATERIALS: BONDING AND SEALING

- Moisture Curing Elastomeric Products Include:
  - High modulus single-component, PU-based adhesives
  - Low modulus single-component, SMP-based adhesives
- Controlled Curing Elastomeric Products Include:
  - Accelerated single-component, PU-and-SMP-based adhesives
  - Two-part (2k), SMP-based, elastomeric adhesives
- Primerless Elastomeric Products Include:
  - Single-component, moisture-cure or accelerated PU-and SMP-based adhesives
  - Two-part (2k), SMP-based elastomeric adhesives
  - Dual-component, SMP-based adhesives

TYPICAL WINDSCREEN INSTALLATION PROCESS

1. Clean/Abrade
   - Wipe bondline with solvent cleaner.
   - Abrade bondline to promote adhesion.

2. Activate/Prime
   - Wipe bondline with activator.
   - Apply primer to paint and glass to promote adhesion.

3. Apply Window Bonding Product
   - Apply adhesive to glass.
   - Position glass onto cabin before skin formation.

4. Fixture
   - Make final adjustments/alignments.
   - Fixture glass with tape or clamps until drive-away time.

5. Backfill
   - Seam seal gaps around glass.
   - Smooth bead with gloved finger or spatula.

CROSS SECTION OF TRADITIONAL WINDOW BONDING APPLICATION
ELASTOMERIC STRUCTURAL BONDING ADHESIVES

Elastomeric structural bonding adhesives are widely utilized to bond front windscreens and side glass to rail vehicles. These materials eliminate the need for rubber seals, leading to improved vehicle appearance. Elastomeric adhesives are also ideal for large panel bonding of specialty vehicle and rail structures. While increasing aesthetics, lightweighting the vehicle, and still maintaining structural strength, elastomeric adhesives also maintain elasticity for improvement of torsional stiffness and accommodation of differential thermal expansion.

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>CHEMISTRY</th>
<th>AP</th>
<th>EU</th>
<th>NA</th>
<th>COLOR</th>
<th>MIX RATIO</th>
<th>OPEN TIME (MIN.)</th>
<th>CURE TIME (HOURS)</th>
<th>TENSILE STRENGTH MPa</th>
<th>SHEAR STRENGTH STEEL - MPA</th>
<th>ELONGATION %</th>
<th>HARDNESS SHORE A</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCTITE® UK UK 8103 B15 / UK 5400</td>
<td>Polyurethane</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Beige</td>
<td>3.9:1 by volume</td>
<td>15</td>
<td>72</td>
<td>N/A</td>
<td>&gt;6</td>
<td>N/A</td>
<td>Panel lamination adhesive</td>
<td></td>
</tr>
<tr>
<td>TEROSON 939 FR</td>
<td>MS Polymer</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Black, Grey</td>
<td>1k</td>
<td>10</td>
<td>24</td>
<td>3.0</td>
<td>N/A</td>
<td>180</td>
<td>55</td>
<td>Flame-resistant, adhesive and sealant, DIN 6701 data available</td>
</tr>
<tr>
<td>TEROSON 939 FR / 9371 B</td>
<td>MS Polymer</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Black, Grey</td>
<td>Static Mix (10:1)</td>
<td>10</td>
<td>24</td>
<td>3.0</td>
<td>N/A</td>
<td>180</td>
<td>55</td>
<td>Greater depth of cure and cure independent of atmospheric moisture</td>
</tr>
<tr>
<td>TEROSON MS 9320 SF</td>
<td>MS Polymer</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Gray, Black</td>
<td>1k</td>
<td>10</td>
<td>24</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>30</td>
<td>Excellent for lamination and sealing</td>
</tr>
<tr>
<td>TEROSON MS 937</td>
<td>MS Polymer</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>White, Black, Grey</td>
<td>1k</td>
<td>15</td>
<td>24</td>
<td>3.0</td>
<td>N/A</td>
<td>220</td>
<td>50</td>
<td>General-purpose bonding, longer open time to allow part alignment faster setting than MS 939</td>
</tr>
<tr>
<td>TEROSON MS 939</td>
<td>MS Polymer</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>White, Black, Grey</td>
<td>1k</td>
<td>10</td>
<td>24</td>
<td>3.0</td>
<td>N/A</td>
<td>250</td>
<td>55</td>
<td>General-purpose bonding adhesive with very good environmental resistance</td>
</tr>
<tr>
<td>TEROSON PU 8590 N/M</td>
<td>Polyurethane</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Black</td>
<td>1k</td>
<td>30</td>
<td>27</td>
<td>8.0</td>
<td>6.0</td>
<td>450</td>
<td>65</td>
<td>General-purpose adhesive; Exclusive to India</td>
</tr>
<tr>
<td>TEROSON PU 8590 UHV BUS</td>
<td>Polyurethane</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Black</td>
<td>1k</td>
<td>25</td>
<td>24</td>
<td>8.0</td>
<td>5</td>
<td>450</td>
<td>60</td>
<td>Good UV resistance, smooths well, requires primer, DIN 6701</td>
</tr>
<tr>
<td>TEROSON PU 8630 HMLC</td>
<td>Polyurethane</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Black</td>
<td>Static Mix (1:1)</td>
<td>25</td>
<td>24</td>
<td>9.5</td>
<td>4.5</td>
<td>370</td>
<td>60</td>
<td>Two-part window bonder, warm-applied, long open time, rapid fixture</td>
</tr>
<tr>
<td>TEROSON PU 8900 LV</td>
<td>Polyurethane</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Black</td>
<td>1k</td>
<td>20</td>
<td>24</td>
<td>8.0</td>
<td>5</td>
<td>400</td>
<td>55</td>
<td>Primerless designed for bonding, DIN 6701 data available</td>
</tr>
<tr>
<td>TEROSON VR 5000</td>
<td>Solvent-based SBR</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Beige</td>
<td>Pre-mixed</td>
<td>10</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>TEROSON MS 9399</td>
<td>MS Polymer</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>White, Black, Grey</td>
<td>Static Mix (1:1)</td>
<td>30</td>
<td>24</td>
<td>3.0</td>
<td>2</td>
<td>150</td>
<td>55</td>
<td>High cure-through depth, DIN 6701 data available</td>
</tr>
</tbody>
</table>

- Product highlighted = GO TO product
## Rigid Structural Bonding Adhesives

Rigid bonders can be used for constant fixturing to hold primary structures together. They are used in place of mechanical fasteners and thereby reduce leaks, eliminate galvanic corrosion issues, improve vehicle aesthetics, and allow for lighter weight vehicles for better fuel efficiencies.

<table>
<thead>
<tr>
<th>Product</th>
<th>Chemistry</th>
<th>AP</th>
<th>EU</th>
<th>NA</th>
<th>Mix Ratio</th>
<th>Fixturing Time (Min.)</th>
<th>Cure Time (Hours)</th>
<th>Tensile Strength MPA</th>
<th>Shear Strength Steel - MPA</th>
<th>Elongation %</th>
<th>Hardness Shore D</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Loctite AA H3000</strong></td>
<td>Acrylic</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>1:1</td>
<td>15</td>
<td>24</td>
<td>28.2</td>
<td>28.6</td>
<td>25</td>
<td>N/A</td>
<td>Easy to use, one-to-one mix ratio</td>
</tr>
<tr>
<td><strong>Loctite AA H8000</strong></td>
<td>Acrylic</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>10:1</td>
<td>30</td>
<td>24</td>
<td>14.8</td>
<td>22.9</td>
<td>13</td>
<td>70</td>
<td>Robust, works on oily metal, excellent weather resistance</td>
</tr>
<tr>
<td><strong>Loctite EP 5089</strong></td>
<td>Epoxy</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>1:2, heat</td>
<td>N/A</td>
<td>10 min. at 155°C</td>
<td>&gt;30</td>
<td>31.1</td>
<td>9</td>
<td>68</td>
<td>Toughened heat cure epoxy, high shear, peel, impact, and thermal resistance</td>
</tr>
<tr>
<td><strong>Loctite AA 3560</strong></td>
<td>Acrylic</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>10:1</td>
<td>25 min.</td>
<td>24</td>
<td>19</td>
<td>21</td>
<td>30</td>
<td>69</td>
<td>Halogen-free, for tough, impact-resistant applications</td>
</tr>
</tbody>
</table>

Product highlighted = GO TO product

### Adhesive Features
- High strength bonds
- Can be used to bond dissimilar substrates

## Adhesives for Small Part Bonding

When dealing with smaller components, the strength requirements are often very different. With a small bond area, a much higher strength per contact area is required than with larger parts. Smaller parts can also have different requirements under influences such as thermal cycling.

<table>
<thead>
<tr>
<th>Product</th>
<th>Chemistry</th>
<th>AP</th>
<th>EU</th>
<th>NA</th>
<th>Mix Ratio</th>
<th>Fixturing Time (Min.)</th>
<th>Cure Time (Hours)</th>
<th>Tensile Strength MPA</th>
<th>Shear Strength Steel - MPA</th>
<th>Elongation %</th>
<th>Hardness Shore D</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Loctite EA 9450</strong></td>
<td>Epoxy</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Static Mix (1:1)</td>
<td>13</td>
<td>24</td>
<td>17</td>
<td>23</td>
<td>40</td>
<td>70</td>
<td>Ultra tough, impact resistant</td>
</tr>
<tr>
<td><strong>Loctite EA E-20HP</strong></td>
<td>Epoxy</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Static Mix (2:1)</td>
<td>20</td>
<td>24</td>
<td>39</td>
<td>23</td>
<td>8</td>
<td>80</td>
<td>High strength with exceptional toughness</td>
</tr>
<tr>
<td><strong>Loctite EA E-60HP</strong></td>
<td>Epoxy</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Static Mix (2:1)</td>
<td>60</td>
<td>24</td>
<td>35</td>
<td>30</td>
<td>9</td>
<td>80</td>
<td>High strength with extended cure life and exceptional toughness</td>
</tr>
<tr>
<td><strong>Loctite HY 4070</strong></td>
<td>Hybrid</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Static Mix (10:1)</td>
<td>1</td>
<td>24</td>
<td>15</td>
<td>25</td>
<td>5</td>
<td>65</td>
<td>Rapid curing product for metal and plastic part bonding</td>
</tr>
<tr>
<td><strong>Loctite HY 4080GY</strong></td>
<td>Hybrid</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Static Mix (1:1)</td>
<td>10</td>
<td>24</td>
<td>11</td>
<td>26</td>
<td>80</td>
<td>72</td>
<td>Rapid fixturing hybrid adhesive</td>
</tr>
<tr>
<td><strong>Loctite 480</strong></td>
<td>Cyanoacrylate</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>1k</td>
<td>2</td>
<td>24</td>
<td>20</td>
<td>26</td>
<td>N/A</td>
<td>N/A</td>
<td>Toughened instant adhesive</td>
</tr>
<tr>
<td><strong>Loctite HY 4090GY</strong></td>
<td>Hybrid</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Static Mix (1:1)</td>
<td>30</td>
<td>168</td>
<td>7.1</td>
<td>17</td>
<td>N/A</td>
<td>67</td>
<td>Rapid fixturing hybrid adhesive with maximum chemical resistance</td>
</tr>
<tr>
<td><strong>Loctite EA-E-120HP</strong></td>
<td>Epoxy</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Static Mix (2:1)</td>
<td>&gt;180</td>
<td>24</td>
<td>40</td>
<td>29</td>
<td>10</td>
<td>N/A</td>
<td>Non-sag epoxy with extended open time to allow alignment</td>
</tr>
</tbody>
</table>

Product highlighted = GO TO product

### Adhesive Features
- Rapid fixture
- Normally primerless
### ELASTOMERIC SEALANTS

Henkel’s elastomeric sealants are formulated to provide a long-term durable seal in both indoor and outdoor environments. Elastomeric sealants can provide the necessary elongation for movement between parts during expansion and contraction, can be used to seal gaps and areas where there may be leaks, and can keep foreign materials at bay. Henkel SMP materials are compatible with most paint systems to allow seamless blending with the exterior finish for enhanced vehicle aesthetics.

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>CHEMISTRY</th>
<th>AP</th>
<th>EU</th>
<th>NA</th>
<th>COLOR</th>
<th>CURE MECHANISM</th>
<th>OPEN TIME (MIN.)</th>
<th>CURE TIME (HOURS)</th>
<th>TENSILE STRENGTH MPA</th>
<th>SHEAR STRENGTH STEEL - MPA</th>
<th>ELONGATION %</th>
<th>HARDNESS SHORE A</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEROSON MS 930</td>
<td>MS Polymer</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Black, White, Grey</td>
<td>Moisture</td>
<td>30</td>
<td>24</td>
<td>0.9</td>
<td>N/A</td>
<td>490</td>
<td>25</td>
<td>Low modulus, high elongation sealant for interior and exterior usage</td>
</tr>
<tr>
<td>TEROSON 930</td>
<td>MS Polymer</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Black, White, Grey</td>
<td>Moisture</td>
<td>30</td>
<td>24</td>
<td>0.9</td>
<td>N/A</td>
<td>490</td>
<td>25</td>
<td>Low modulus, high elongation sealant for interior and exterior usage</td>
</tr>
<tr>
<td>TEROSON 935</td>
<td>MS Polymer</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>White, Black, Grey</td>
<td>Moisture</td>
<td>10</td>
<td>24</td>
<td>2.8</td>
<td>N/A</td>
<td>230</td>
<td>50</td>
<td>Interior and exterior sealing</td>
</tr>
<tr>
<td>TEROSON MS 660</td>
<td>MS Polymer</td>
<td>✔</td>
<td></td>
<td></td>
<td>Clear</td>
<td>Moisture</td>
<td>10</td>
<td>24</td>
<td>2.0</td>
<td>N/A</td>
<td>230</td>
<td>40</td>
<td>Interior sealing</td>
</tr>
<tr>
<td>TEROSON MS 9320 SF</td>
<td>MS Polymer</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Grey</td>
<td>Moisture</td>
<td>10</td>
<td>24</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>30</td>
<td>Sprayable low viscosity</td>
</tr>
<tr>
<td>TEROSON RB 2759</td>
<td>Rubber</td>
<td>✔</td>
<td></td>
<td></td>
<td>Grey</td>
<td>Solvent Evaporation</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Sealant for mechanically mounted windows</td>
<td></td>
</tr>
<tr>
<td>TEROSON RB 4006</td>
<td>Rubber</td>
<td>✔</td>
<td></td>
<td></td>
<td>Grey</td>
<td>Solvent Evaporation</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>Sealant for mechanically mounted windows</td>
<td></td>
</tr>
</tbody>
</table>

### ELASTOMERIC BONDING PRIMERS/CLEANERS

Most elastomeric bonding systems can benefit from the use of a primer in order to promote adhesion. Some primers also contain a UV blocking agent that when used for glass bonding, protects the bond line from UV light, and eliminates UV degradation of bond strength over time. Henkel provides a range of cleaners that are ideal for ensuring a clean surface for bonding products to deliver maximum performance.

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>CHEMISTRY</th>
<th>AP</th>
<th>EU</th>
<th>NA</th>
<th>COLOR</th>
<th>CURE MECHANISM</th>
<th>DRY TIME (MIN.)</th>
<th>ACTIVE TIME</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEROSON PU 8517H</td>
<td>Solvent</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Black</td>
<td>Evaporation</td>
<td>5</td>
<td>3 months</td>
<td>Long open time black primer that protects bonds from UV and improves adhesion on glass and ceramic frit.</td>
</tr>
<tr>
<td>TEROSON PU 8519P</td>
<td>Solvent</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Black</td>
<td>Evaporation</td>
<td>2</td>
<td>60 min.</td>
<td>Black primer that protect bond lines from UV and improve adhesion on materials, especially glass and ceramic frit.</td>
</tr>
<tr>
<td>TEROSON PU 8550</td>
<td>Solvent</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Clear</td>
<td>Evaporation</td>
<td>0.5</td>
<td>N/A</td>
<td>Cleaner for MS polymers and PU materials</td>
</tr>
<tr>
<td>TEROSON PU 8560</td>
<td>Solvent</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Clear</td>
<td>Evaporation</td>
<td>0.5</td>
<td>60 min.</td>
<td>Activator/cleaner containing silanes to improve adhesion MS polymers and PU materials</td>
</tr>
<tr>
<td>TEROSON SB 450</td>
<td>Solvent</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Clear</td>
<td>Evaporation</td>
<td>0.5</td>
<td>60 min.</td>
<td>Active cleaner that improves adhesion of MS polymer, PU, and silicone materials. Has UV marker to inspect application under black light to verify application.</td>
</tr>
<tr>
<td>TEROSON VR 20</td>
<td>Solvent</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Clear</td>
<td>Evaporation</td>
<td>0.5</td>
<td>N/A</td>
<td>Cleaner designed to be used in window glazing to clean surface and remove silicone residue</td>
</tr>
</tbody>
</table>

► Product highlighted = GO TO product
CREATE STRONGER AND QUIETER EQUIPMENT

Henkel’s solutions to reduce noise, vibration, and harshness (NVH) were originally designed for automotive vehicle cabins and are now used in rail equipment manufacturing. Our TEROSON® brand NVH solutions and LOCTITE® brand adhesives and sealants help enhance material properties and minimize noise.
Henkel is a leading source worldwide for NVH (noise, vibration, and harshness) solutions. We provide advanced NVH technologies and comprehensive design and engineering support to our customers. Henkel has been an NVH partner with the top automotive manufacturers for more than 20 years, and our expertise helps rail equipment manufacturers create dimensionally stronger and quieter products. Our TEROSON® brand NVH solutions and LOCTITE® brand adhesives and sealants help enhance material properties and minimize audible noises.

NVH PRODUCT PORTFOLIO AND TECHNOLOGIES

- Henkel offers a full portfolio of NVH solutions in five categories – reinforcement, damping, sealing, absorption, and barrier – detailed in Figure 1.
- Our portfolio covers 15 core technologies through the frequency range of 0.1 Hz up to 20 kHz. In addition, our capabilities allow us to provide solutions outside our core technologies.
- We provide effective solutions to airborne noise and structure-borne noise, as well as vibration and leakage.
- We help our customers achieve high performance sealing and save on process cost through automation.

VIBRATION RESPONSE TEST (FIGURE 2)

BEFORE

AFTER

Vibration response test for side panel. Red/yellow indicates high levels of vibration.

Test results for side panel using Henkel expandable material. Blue/green indicates low levels of vibration.
## NOISE, VIBRATION, AND HARSHNESS SOLUTIONS (FIGURE 1)

<table>
<thead>
<tr>
<th>DAMPING</th>
<th>SEALING</th>
<th>ABSORPTION</th>
<th>BARRIER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ATTENUATE VIBRATION</strong> of panel structure</td>
<td><strong>ISOLATE</strong> noise sources</td>
<td><strong>REDUCE</strong> reverberant noise</td>
<td><strong>BLOCK</strong> sound transmission</td>
</tr>
<tr>
<td>- Liquid applied sound deadener</td>
<td>- Semi-Structural Adhesive/Sealant</td>
<td>- Acoustic Barrier/Absorber</td>
<td></td>
</tr>
<tr>
<td>- Water-based damping</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- High damping foam</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Constrained layer pads</td>
<td>-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### SOLUTIONS

<table>
<thead>
<tr>
<th><strong>DAMPING</strong></th>
<th><strong>SEALING</strong></th>
<th><strong>ABSORPTION</strong></th>
<th><strong>BARRIER</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>- High loss factor performance</td>
<td>- Less welding</td>
<td>- High Sound Transmission Loss (STL) performance</td>
<td></td>
</tr>
<tr>
<td>- Structural vibration reduction</td>
<td>- Less corrosion</td>
<td>- High absorption performance</td>
<td></td>
</tr>
<tr>
<td>- Improves NVH performance</td>
<td>- Process cost savings through automation</td>
<td>- Tunable performance</td>
<td></td>
</tr>
<tr>
<td>- Converts vibration into thermal energy</td>
<td>-</td>
<td>- Complexity reduction</td>
<td></td>
</tr>
<tr>
<td>- Reduction in sound pressure levels</td>
<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Easy to apply on various substrates</td>
<td>-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### NVH TECHNOLOGY OVERVIEW

<table>
<thead>
<tr>
<th>FREQUENCY</th>
<th>AIRBORNE NOISE</th>
<th>STRUCTURAL NOISE</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 kHz</td>
<td><strong>BARRIER</strong></td>
<td><strong>DAMPING</strong></td>
</tr>
<tr>
<td>1 kHz</td>
<td><strong>ABSORPTION</strong></td>
<td><strong>REINFORCEMENT</strong></td>
</tr>
<tr>
<td>100 Hz</td>
<td><strong>SEALING</strong></td>
<td></td>
</tr>
<tr>
<td>20 Hz</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **BARRIER**: Multilayer with EVA Sound Insulation, Fiber (Nonwoven) Absorber, Open Cell Foam Absorber, Preformed Mastic Parts (Non-Expanding), Preformed Parts: Expandable Soft Foams
- **ABSORPTION**: Bitumen Sheets, Constrained Layer Damping Pads (CLD), Aqueous Synthetic Damping - Large Surface (rail), Liquid Applied Sound Deadener (LASD), Pumpable Anti-Flutter, Bonding With Semi-Structured Adhesives, Bonding With Structural Adhesives, Injection of Structural Hard Foams - RT - RIM, Preformed Parts: 3D Structural Foam - Thin Gauge Metal (auto), Preformed Parts: 2D Structural Tapes and Pads
- **SEALING**: Bonding With Structural Adhesives
- **DAMPING**: Bonding With Structure Adhesives
- **REINFORCEMENT**: Bonding With Semi-Structured Adhesives, Preformed Parts: 3D Structural Foam - Thin Gauge Metal (auto), Preformed Parts: 2D Structural Tapes and Pads
ACOUSTIC COATINGS/PADS FOR NOISE CONTROL

INTERIOR NVH COATINGS

Henkel is a leading provider of materials designed to be applied to the interior shell of rail coaches to reduce noise, vibration and harshness to ensure passenger comfort. These products are ideal for interior applications where there is a need to reduce sound from flat surfaces producing noise within a sealed structure.

ADHESIVE FEATURES

- Easy to apply
- Solvent-free
- Spray applied formula available
- Low VOC

<table>
<thead>
<tr>
<th>PRODUCT NAME</th>
<th>AP</th>
<th>EU</th>
<th>NA</th>
<th>SERVICE TEMPERATURE °C</th>
<th>COLOR</th>
<th>DRYING TIME (4 MM WET FILM) (DIN EN ISO 291) HOURS</th>
<th>LOSS FACTOR FOR 2 MM DRY FILM (DIN EN ISO 6721-3 (200°C, 200 HZ, SHEET STEEL 1 MM))</th>
<th>DENSITY, WET/DRY G/CM³</th>
<th>SOLIDS CONTENT %</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEROSON WT 112 DB</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>-50°C to 120°C</td>
<td>Beige</td>
<td>24</td>
<td>&gt;=0.22</td>
<td>1.40 / 1.20</td>
<td>67</td>
</tr>
<tr>
<td>TEROSON WT 123 FF</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>-50°C to 120°C</td>
<td>Beige</td>
<td>24</td>
<td>1.3-1.6 (wet)</td>
<td>66-72</td>
<td></td>
</tr>
<tr>
<td>TEROSON WT 123 FRF</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>-50°C to 120°C</td>
<td>Beige</td>
<td>24</td>
<td>&gt;=0.22</td>
<td>1.40 / 1.20</td>
<td>66-72</td>
</tr>
<tr>
<td>TEROSON WT 123 GR</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>-50°C to 120°C</td>
<td>Beige</td>
<td>24</td>
<td>&gt;=0.10</td>
<td>1.40</td>
<td>68-75</td>
</tr>
<tr>
<td>TEROSON WT 123 WF</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>-50°C to 120°C</td>
<td>Beige</td>
<td>24</td>
<td>&gt;=0.19</td>
<td>1.40 / 1.3</td>
<td>73</td>
</tr>
<tr>
<td>TEROSON WT 129</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>-50°C to 120°C</td>
<td>Beige</td>
<td>24</td>
<td>&gt;=0.19</td>
<td>1.34 / 1.2</td>
<td>70</td>
</tr>
</tbody>
</table>

Product highlighted = GO TO product

UNDERBODY PROTECTIVE COATINGS

TEROSON® protective coatings are designed to be applied to the bottom of rail carriages. They protect the bottom of the vehicle from stone and other damage by forming a continuous coating that is impact-and-water-resistant. The coatings ultimately maintain the structural integrity of the floor system and reduce noise to produce a quieter environment for passengers.

ADHESIVE FEATURES

- Easy to apply
- Noise reduction
- Anti-stone/chip

<table>
<thead>
<tr>
<th>PRODUCT NAME</th>
<th>AP</th>
<th>EU</th>
<th>NA</th>
<th>COLOR</th>
<th>DRYING TIME (4 MM WET FILM) (DIN EN ISO 291) HOURS</th>
<th>LOSS FACTOR FOR 2 MM DRY FILM (DIN EN ISO 6721-3 (200°C, 200 HZ, SHEET STEEL 1 MM))</th>
<th>DENSITY, WET/DRY G/CM³</th>
<th>SOLIDS CONTENT %</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEROSON WT 218</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Grey</td>
<td>22 - 48 depending on thickness applied</td>
<td>&gt;= 0.05</td>
<td>1.23</td>
<td>67</td>
<td>High Abrasion Resistance</td>
</tr>
<tr>
<td>TEROSON WT 218 FR 200</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Grey</td>
<td>21 - 48 depending on thickness applied</td>
<td>&gt;= 0.05</td>
<td>1.53</td>
<td>77</td>
<td>Good Fire Behavior</td>
</tr>
</tbody>
</table>

Product highlighted = GO TO product
ANTI-SLIP FLOOR COATINGS

Rail service workers often need to work on the roof or access areas using narrow passages. Coating these low-traffic, but potentially higher risk areas with our anti-slip floor coatings reduces job-related slips and falls and increases workplace safety. These coatings are also recommended for ramps, stairs, walkways, and other pedestrian service areas.

ADHESIVE FEATURES

- Roller, spray, and trowel applications available
- Can be used on multiple surfaces
- Good flexibility
- Work in wet environment
- Good chemical, moisture, and UV resistance
- Indoor and outdoor suitable

<table>
<thead>
<tr>
<th>PRODUCT NAME</th>
<th>AP</th>
<th>EU</th>
<th>NA</th>
<th>CHEMICAL BASE</th>
<th>COLOR</th>
<th>UV RESISTANT</th>
<th>WET EXPOSURE</th>
<th>RECOMMENDED PRIMER METAL SURFACES</th>
<th>RECOMMENDED PRIMER WOOD, TILE, AND POROUS SURFACES</th>
<th>USE FOR</th>
<th>ALSO KNOWN AS</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCTITE PC 2760 RAIL</td>
<td>✔</td>
<td></td>
<td></td>
<td>Epoxy</td>
<td>Black</td>
<td>Some</td>
<td>Intermittent</td>
<td>LOCTITE PC 7643 Metal Primer</td>
<td>LOCTITE PC 6241 Water-Based Primer</td>
<td>Wood, concrete, and metal surfaces to increase traction to minimize falls. Not for continuously wet environments.</td>
<td>Heavy Duty Pedestrian Grade</td>
</tr>
<tr>
<td>LOCTITE PC 6255</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td>Acrylic</td>
<td>Grey or Black</td>
<td>Yes</td>
<td>Yes</td>
<td>LOCTITE PC 7643 Metal Primer</td>
<td>LOCTITE PC 6253 Acrylic Primer</td>
<td>Best for metal surfaces subject to thermal cycling due to good flexibility.</td>
<td>Acrylic Pedestrian Grade</td>
</tr>
<tr>
<td>LOCTITE PC 6261</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td>Epoxy</td>
<td>Grey or Black</td>
<td>Some</td>
<td>Intermittent</td>
<td>LOCTITE PC 7643 Metal Primer</td>
<td>LOCTITE PC 6241 Water-Based Primer</td>
<td>Wood, concrete, and metal surfaces to increase traction to minimize falls. Not for continuously wet environments.</td>
<td>Heavy Duty Pedestrian Grade</td>
</tr>
</tbody>
</table>

For metal surfaces we recommend a primer to ensure optimal adhesion and service life.

Anti-slip floor coatings can be applied by the OEM manufacturer or the end transit or rail operator.
MACHINERY ADHESIVES AND MAINTENANCE

THREADLOCKING, THREADSEALING, RETAINING, GASKETING, LUBRICATING, AND REPAIRING WITH LOCTITE® PRODUCTS

Henkel's wide range of LOCTITE® threadlocking, thread sealing, gasketing, and retaining products help manufacturers increase reliability and reduce downtime. Our innovative and reliably engineered adhesives replace mechanical locking and sealing methods, prevent loosening from vibration, strengthen the assembly, and protect against leaks and corrosion.
THREAD SEALANTS

LOCTITE® anaerobic thread sealants prevent leakage of gases and liquids. Designed for low pressure and high pressure applications, they fill the space between threaded parts and provide an instant, low pressure seal. When fully cured, they seal to the burst strength of most pipe systems. Thread Sealants prevent loosening from shock and vibration, as well as fill air voids to prevent leakage of fluid/gas being sealed.

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>AP</th>
<th>EU</th>
<th>NA</th>
<th>TYPICAL USE</th>
<th>COLOR AND APPEARANCE</th>
<th>VISCOSITY (CP)</th>
<th>TEMPERATURE RANGE</th>
<th>PRESSURE RESISTANCE (PSI)</th>
<th>RECOMMENDED PRIMER</th>
<th>AGENCY APPROVALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCTITE® 542 PIPE SEALANT</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Hydraulic lines, smaller pneumatic fittings</td>
<td>Brown</td>
<td>2,000</td>
<td>-65°F to 300°F (-54°C to 149°C)</td>
<td>10,000</td>
<td>SF 7088, SF 7471 or SF 7649</td>
<td>DVGW WRAS</td>
</tr>
<tr>
<td>LOCTITE® 5452 THREAD SEALANT</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Pneumatic hydraulic sealant, no fillers</td>
<td>Purple</td>
<td>29,000/200,000 thixotropic</td>
<td>-65°F to 300°F (-54°C to 149°C)</td>
<td>10,000</td>
<td>SF 7088, SF 7649 or SF 7471</td>
<td>ABS, CFIA</td>
</tr>
<tr>
<td>LOCTITE® 545 PIPE SEALANT</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Hydraulic lines, smaller pneumatic fittings</td>
<td>Purple</td>
<td>14,000</td>
<td>-65°F to 300°F (-54°C to 149°C)</td>
<td>10,000</td>
<td>SF 7088, SF 7649 or SF 7471</td>
<td>UL Classified for U.S., CFIA Listed, NSF / ANSI 61</td>
</tr>
<tr>
<td>LOCTITE® 561 PIPE SEALANT</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>General-purpose, portable, overhead</td>
<td>White Paste</td>
<td>Semisolid</td>
<td>-65°F to 300°F (-54°C to 149°C)</td>
<td>10,000</td>
<td>SF 7088, SF 7649 or SF 7471</td>
<td>DVGW, NSF P1</td>
</tr>
<tr>
<td>LOCTITE® 567 THREAD SEALANT</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>For stainless steel and all other metal fittings; designed for Taper/ Taper NPT Fittings</td>
<td>White</td>
<td>540,000</td>
<td>-65°F to 400°F (-54°C to 204°C)</td>
<td>10,000</td>
<td>SF 7088, SF 7649 or SF 7471</td>
<td>UL Classified for U.S., ABS, CFIA Listed, NSF / ANSI 61, ULC Classified for Canada</td>
</tr>
<tr>
<td>LOCTITE® 577 THREAD SEALANT</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>For European taper to straight piping standard</td>
<td>Yellow</td>
<td>24,000/80,000 Thixotropic</td>
<td>-65°F to 260°F (-54°C to 180°C)</td>
<td>10,000</td>
<td>SF 7088, SF 7649 or SF 7471</td>
<td>DVGW, NSF P1</td>
</tr>
</tbody>
</table>

LOCTITE® PRIMERS

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>AP</th>
<th>EU</th>
<th>NA</th>
<th>COLOR</th>
<th>VISCOSITY (CP)</th>
<th>BASE</th>
<th>ON-PART LIFE</th>
<th>DRY TIME</th>
<th>APPLICATION</th>
<th>AGENCY APPROVALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCTITE® SF 7088 PRIMER</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Teal</td>
<td>Semisolid</td>
<td>No solvent</td>
<td>30 days</td>
<td>None</td>
<td>Anaerobics</td>
<td>N/A</td>
</tr>
<tr>
<td>LOCTITE® SF 7471 PRIMER</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Amber</td>
<td>2</td>
<td>Acetone / Isopropanol</td>
<td>7 days</td>
<td>30 to 70 seconds</td>
<td>Anaerobics</td>
<td>MIL-S-22473E for existing designs, ASTM D-5363 for new designs</td>
</tr>
<tr>
<td>LOCTITE® SF 7649 PRIMER</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Clear / Green</td>
<td>2</td>
<td>Acetone</td>
<td>30 days</td>
<td>30 to 70 seconds</td>
<td>Anaerobics</td>
<td>MIL-S-22473E for existing designs, ASTM D-5363 for new designs, NSF / ANSI 61, NSF P1, CFIA Listed</td>
</tr>
</tbody>
</table>

ADVANTAGES VERSUS TRADITIONAL SEALANT TYPES

- Single component – clean and easy to apply or automate
- Allows for precision alignment, versus PTFE tapes which do not allow adjustment
- Can be used on any size of pipe fitting
- Resists vibration and shock loads
- Protect mated threaded areas against corrosion and galling
THREADLOCKERS

LOCTITE® threadlockers dramatically increase the reliability of threaded assemblies. Available as liquid and semisolid adhesives, LOCTITE threadlockers are applied to the threads of a fastener and cure to a hard thermoset plastic when situated between metal surfaces. They cure in the absence of air and completely fill the gaps between mating threads to lock and seal threads and joints. Threadlockers bond metal fasteners to prevent loosening from shock and vibration, as well as fill voids to seal and protect threads from rust and corrosion.

<table>
<thead>
<tr>
<th>ADVANTAGES VERSUS TRADITIONAL MECHANICAL LOCKING DEVICES</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Fill air void to seal and protect threads from rust and corrosion</td>
</tr>
<tr>
<td>• Single component – clean and easy to apply or automate</td>
</tr>
<tr>
<td>• Can be used on various sizes of fasteners – reduced inventory costs</td>
</tr>
<tr>
<td>• Prevents unwanted movement, loosening, leaks, and corrosion</td>
</tr>
<tr>
<td>• Resist vibration</td>
</tr>
</tbody>
</table>

**KEY FEATURES**

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>AP</th>
<th>EU</th>
<th>NA</th>
<th>TYPICAL USE</th>
<th>PACKAGE TYPE AND SIZE</th>
<th>COLOR</th>
<th>VISCOSITY** (CP)</th>
<th>TORQUE*** (In.-Lbs.)</th>
<th>TEMPERATURE RANGE</th>
<th>CURE SPEED (STEEL AT 25°C)</th>
<th>AGENCY APPROVALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Fasteners</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>LOCTITE 222 THREADLOCKER</strong></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Small screws under 1/4 in.</td>
<td>10 ml bottle 50 ml bottle</td>
<td>Purple</td>
<td>1,200 / 5,000</td>
<td>Thixotropic</td>
<td>53 / 30</td>
<td>-65°F to 300°F</td>
<td>Fixture – 20 min. Full – 24 hrs.</td>
</tr>
<tr>
<td><strong>LOCTITE 243 BLUE THREADLOCKER</strong></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>1/4 in. to 3/4 in. bolts with light oil contamination</td>
<td>50 ml bottle 250 ml bottle 1 liter bottle</td>
<td>Blue</td>
<td>1,300 / 3,000</td>
<td>Thixotropic</td>
<td>230 / 40</td>
<td>-65°F to 360°F</td>
<td>Fixture – 10 min. Full – 24 hrs. NSF/ANSI 61, CFIA Listed</td>
</tr>
<tr>
<td><strong>LOCTITE 248 BLUE THREADLOCKER</strong></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>1/4 in. to 3/4 in. bolts, overhead, pre-dispersed, hard-to-reach areas</td>
<td>9 g stick 19 g stick 260 in. roll</td>
<td>Blue</td>
<td>Semisolid</td>
<td>110° / 43</td>
<td>-65°F to 300°F</td>
<td>Fixture – 5 min. Full – 24 hrs. CFIA Listed</td>
<td></td>
</tr>
<tr>
<td><strong>LOCTITE 249 BLUE THREADLOCKER TAPE</strong></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>1/4 in. to 3/4 in. bolts, overhead, pre-dispersed, hard-to-reach areas</td>
<td>260 in. roll</td>
<td>Blue</td>
<td>Tape</td>
<td>74 / 47</td>
<td>-65°F to 300°F</td>
<td>Fixture – 30 min. Full – 24 hrs. CFIA Listed</td>
<td></td>
</tr>
<tr>
<td><strong>LOCTITE 263 HIGH STRENGTH THREADLOCKER</strong></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Primerless, high strength</td>
<td>50 ml bottle 250 ml bottle 1 liter bottle</td>
<td>Red</td>
<td>400 / 600</td>
<td>290 / 290*</td>
<td>-65°F to 360°F</td>
<td>Fixture – 10 min. Full – 24 hrs. NSF/ANSI 61, CFIA Listed</td>
<td></td>
</tr>
<tr>
<td><strong>LOCTITE 268 HIGH STRENGTH THREADLOCKER – HIGH STRENGTH</strong></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Up to 3/4 in. bolts, overhead, pre-dispersed, hard-to-reach areas</td>
<td>9 g stick 19 g stick</td>
<td>Red</td>
<td>Semisolid</td>
<td>220° / 34</td>
<td>-65°F to 300°F</td>
<td>Fixture – 5 min. Full – 24 hrs. CFIA Listed</td>
<td></td>
</tr>
<tr>
<td><strong>LOCTITE 270 THREADLOCKER</strong></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Primerless, high strength</td>
<td>50 ml bottle 250 ml bottle 1 liter bottle</td>
<td>Red</td>
<td>400 / 600</td>
<td>290 / 290*</td>
<td>-65°F to 360°F</td>
<td>Fixture – 10 min. Full – 24 hrs. NSF/ANSI 61</td>
<td></td>
</tr>
<tr>
<td><strong>LOCTITE 290 THREADLOCKER</strong></td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Medium/high strength, wicking grade for preassembled parts and weld sealing</td>
<td>50 ml bottle 250 ml bottle 1 liter bottle</td>
<td>Green</td>
<td>25 / 55</td>
<td>90 / 260</td>
<td>-65°F to 300°F</td>
<td>Fixture – 20 min. Full – 24 hrs. MIL-S-46163A for existing designs, ASTM D-5363†, NSF/ANSI 61, NSF P1, CFIA Listed</td>
<td></td>
</tr>
</tbody>
</table>

* Product highlighted = GO TO product

* Break loose value.
† For new designs.
RETAINING COMPOUNDS

LOCTITE® anaerobic retaining compounds secure bearings, bushings, and cylindrical parts into housings or onto shafts. They achieve maximum load transmission capability and uniform stress distribution, and eliminate fretting corrosion. Applied as a liquid, they form a 100% contact between mating metal surfaces, eliminating the need for expensive replacement parts, time-consuming machining or the use of mechanical methods.

ADVANTAGES VERSUS CONVENTIONAL ASSEMBLY METHODS
- High shear strength – augments or replaces press fits
- 100% contact – eves distribution of load and stress
- Eliminates fretting and backlash in keys and splines
- Fills air voids to seal and protect from corrosion and fretting
- Relaxes part tolerances

<table>
<thead>
<tr>
<th>PRODUCT</th>
<th>AP</th>
<th>EU</th>
<th>NA</th>
<th>TYPICAL USE</th>
<th>COLOR</th>
<th>MAXIMUM GAP FILL (DIAMETER-INCHES)</th>
<th>VISCOSITY (CP)</th>
<th>SHEAR STRENGTH STEEL / STEEL (PSI)</th>
<th>TEMPERATURE RANGE</th>
<th>CURE SPEED*</th>
<th>RECOMMENDED PRIMER</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCTITE® 540 RETAINING COMPOUND</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>Cup / core plug adhesive sealant</td>
<td>Blue</td>
<td>N/A</td>
<td>7,000 to 12,000</td>
<td>2,030</td>
<td>-65°F to 300°F (-54°C to 149°C)</td>
<td>N/A</td>
<td>SF 7649 or SF 7471</td>
</tr>
<tr>
<td>LOCTITE® 603 RETAINING COMPOUND</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>For close-fitting parts with light contamination</td>
<td>Green</td>
<td>0.005 in.</td>
<td>125</td>
<td>3,770</td>
<td>-65°F to 300°F (-54°C to 149°C)</td>
<td>Fixture - 10 min. Full - 24 hrs.</td>
<td>SF 7088, SF 7649 or SF 7471</td>
</tr>
<tr>
<td>LOCTITE® 620 RETAINING COMPOUND</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>For high temperature applications</td>
<td>Green</td>
<td>0.015 in.</td>
<td>8,500</td>
<td>3,800</td>
<td>-65°F to 450°F (-54°C to 232°C)</td>
<td>Fixture - 1 hr. Full - 24 hrs.</td>
<td>SF 7088, SF 7649 or SF 7471</td>
</tr>
<tr>
<td>LOCTITE® 638</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>High strength, primerless, oil tolerant, for slip-fitted products</td>
<td>Green</td>
<td>0.010 in. (0.25 mm)</td>
<td>2,500, 4,500</td>
<td>3,335</td>
<td>-65°F to 355°F (-54°C to 180°C)</td>
<td>Fixture - 4 min Full - 24 hrs.</td>
<td>Not Required</td>
</tr>
<tr>
<td>LOCTITE® 648 RETAINING COMPOUND</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>Fast fixturing for close-fitting parts, high strength for stainless steel</td>
<td>Green</td>
<td>0.006 in.</td>
<td>500</td>
<td>3,900</td>
<td>-65°F to 355°F (-54°C to 180°C)</td>
<td>Fixture - 5 min. Full - 24 hrs.</td>
<td>SF 7088, SF 7649 or SF 7471</td>
</tr>
<tr>
<td>LOCTITE® 660 RETAINING COMPOUND</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>For repair of worn machinery parts</td>
<td>Silver</td>
<td>0.020 in.</td>
<td>250,000 / 1,500,000 Thixotropic</td>
<td>3,335</td>
<td>-65°F to 300°F (-54°C to 149°C)</td>
<td>Fixture - 20 min. Full - 24 hrs.</td>
<td>SF 7088, SF 7649 or SF 7471</td>
</tr>
<tr>
<td>LOCTITE® 668 RETAINING COMPOUND</td>
<td>✓</td>
<td>✓</td>
<td>Bonding of cylindrical fitting parts</td>
<td>Green</td>
<td>0.005 in.</td>
<td>Semisolid</td>
<td>610</td>
<td>2,610</td>
<td>-65°F to 400°F (-54°C to 204°C)</td>
<td>Not Required</td>
<td>SF 7649 or SF 7471</td>
</tr>
</tbody>
</table>

* Product highlighted = GO TO product
* Varies with substrates.
GASKETING

GASKETING PRODUCTS
LOCTITE® gasketing products are self-forming gaskets that provide a perfect seal between components, with maximum face-to-face contact, eliminating flange face corrosion. They form a low-pressure seal immediately on assembly and fully cure in 24 hours, providing a joint that will not shrink, crack, or relax. They are available as anaerobic products for rigid flanges and silicone products for flexible flanges.

LOCTITE ANAEROBIC GASKETING PRODUCTS

<table>
<thead>
<tr>
<th>PRODUCTS</th>
<th>AP</th>
<th>EU</th>
<th>NA</th>
<th>COLOR</th>
<th>TYPICAL USE</th>
<th>GAP FILL (INCHES)</th>
<th>CURED STATE</th>
<th>VISCOSITY (CP)*</th>
<th>TEMPERATURE RANGE</th>
<th>CURE SPEED</th>
<th>RECOMMENDED PRIMER</th>
<th>SPECIFIC GRAVITY</th>
<th>AGENCY APPROVALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCTITE 510</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Red</td>
<td>High temp. applications, excellent solvent resistance</td>
<td>Unprimed – 0.010 Primed – 0.020</td>
<td>Rigid</td>
<td>90,000 / 500,000 Thixotropic</td>
<td>-65°F to 400°F (-54°C to 204°C)</td>
<td>Unprimed – 4 to 24 hrs. Primed – 30 min. to 4 hrs.</td>
<td>SF 7088, SF 7471 or SF 7649</td>
<td>1.16</td>
<td>N/A</td>
</tr>
<tr>
<td>FLANGE SEALANT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>LOCTITE 518</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Red</td>
<td>For all metals, including aluminum flanges</td>
<td>Unprimed – 0.010 Primed – 0.050</td>
<td>Flexible</td>
<td>800,000 / 3,750,000 Thixotropic</td>
<td>-65°F to 300°F (-54°C to 149°C)</td>
<td>Unprimed – 4 to 24 hrs. Primed – 30 min. to 4 hrs.</td>
<td>SF 7088, SF 7471 or SF 7649</td>
<td>1.13</td>
<td>NSF / ANSI 61, CFIA Listed</td>
</tr>
<tr>
<td>FLANGE SEALANT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOCTITE 5128</td>
<td>✔</td>
<td></td>
<td></td>
<td>Red</td>
<td>For all metals, including aluminum flanges</td>
<td>Unprimed – 0.010 Primed – 0.020</td>
<td>Highly Flexible</td>
<td>10,000 / 50,000 Thixotropic</td>
<td>-65°F to 300°F (-54°C to 149°C)</td>
<td>Unprimed – 4 to 24 hrs. Primed – 30 min. to 4 hrs.</td>
<td>SF 7088, SF 7471 or SF 7649</td>
<td>1.10</td>
<td>N/A</td>
</tr>
<tr>
<td>FLANGE SEALANT</td>
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<td></td>
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</tr>
</tbody>
</table>

* NOTE: Different test methods were used. Please see SDS, or consult with Henkel Engineering for test specifications.

LOCTITE SILICONE GASKETING PRODUCTS

<table>
<thead>
<tr>
<th>PRODUCTS</th>
<th>AP</th>
<th>EU</th>
<th>NA</th>
<th>COLOR</th>
<th>CONSISTENCY</th>
<th>OIL RESISTANCE</th>
<th>TEMPERATURE RANGE (INTERMITENT)</th>
<th>SEALING TIME</th>
<th>AGENCY APPROVALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCTITE SI 587 BLUE, HIGH PERFORMANCE RTV SILICONE GASKET MAKER</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Blue</td>
<td>Paste</td>
<td>Increased oil resistance</td>
<td>-75°F to 500°F (-59°C to 260°C)</td>
<td>Tack-free – 30 min. Full strength – 24 hrs.</td>
<td>NSF P1, CFIA Listed, ABS</td>
</tr>
<tr>
<td>LOCTITE SI 5900</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Black</td>
<td>Paste</td>
<td>Oil / water resistant</td>
<td>-65°F to 500°F (-54°C to 260°C)</td>
<td>Tack-free – 30 min. Full strength – 24 hrs.</td>
<td>NSF P1, CFIA Listed</td>
</tr>
<tr>
<td>LOCTITE SI 5699 GREY, HIGH PERFORMANCE RTV SILICONE GASKET MAKER</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Grey</td>
<td>Paste</td>
<td>Increased oil resistance</td>
<td>-75°F to 625°F (-59°C to 329°C)</td>
<td>Tack-free – 30 min. Full strength – 24 hrs.</td>
<td>CFIA Listed</td>
</tr>
</tbody>
</table>

* Product highlighted = GO TO product
# ANTI-SEIZE LUBRICANTS

**ANTI-SEIZE LUBRICANTS**

LOCTITE® anti-seize products provide lubrication as well as protection against rust, corrosion, seizing and galling. Anti-seizes are typically the products of choice for high temperature applications because of their unique ability to provide protection in extreme temperature conditions. Each product contains a combination of solid lubricating agents resulting in different high temperature limits and lubricities.

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Also Known As</th>
<th>AP</th>
<th>EU</th>
<th>NA</th>
<th>Color</th>
<th>Solid Lubricating Agent</th>
<th>Torque Coefficient</th>
<th>Temperature Range Celsius</th>
<th>&quot;Metal Free (Y/N)&quot;</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCTITE LB 771</td>
<td>Nickel Anti-Seize</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Silver</td>
<td>Nickel/Graphite</td>
<td>0.13</td>
<td>-30°C to 1315°C</td>
<td>N</td>
<td>Best for very high temperature applications</td>
</tr>
<tr>
<td>LOCTITE LB 8007</td>
<td>CS-A Copper-Based Anti-Seize</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Copper</td>
<td>Copper/Graphite</td>
<td>0.16</td>
<td>-30°C to 980°C</td>
<td>N</td>
<td>Copper based formula Aerosol Version spray can</td>
</tr>
<tr>
<td>LOCTITE LB 8008</td>
<td>CS-A Copper-Based Anti-Seize</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Copper</td>
<td>Copper/Graphite</td>
<td>0.16</td>
<td>-30°C to 980°C</td>
<td>N</td>
<td>Copper based formula</td>
</tr>
<tr>
<td>LOCTITE LB 8009</td>
<td>Heavy Duty Anti-Seize</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Grey</td>
<td>Calcium Carbonate/Graphite</td>
<td>0.16</td>
<td>-30°C to 1315°C</td>
<td>Y</td>
<td>Metal Free, all metals but especially Stainless Steel and Aluminum</td>
</tr>
<tr>
<td>LOCTITE LB 8023</td>
<td>Marine Grade Anti-Seize</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Black</td>
<td>Calcium Sulfonate</td>
<td>0.18</td>
<td>-30°C to 1315°C</td>
<td>Y</td>
<td>Works well for high humidity, fresh and salt water exposure. Very high wash out resistance. Best for salt metals. Protects aluminum and ferrous surfaces from seizure</td>
</tr>
<tr>
<td>LOCTITE LB 8044</td>
<td>Zinc Anti-Seize</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Grey</td>
<td>Zinc</td>
<td>0.15</td>
<td>-30°C to 400°C</td>
<td>N</td>
<td>Copper based formula semi-solid stick</td>
</tr>
<tr>
<td>LOCTITE LB 8065</td>
<td>CS-A Copper-Based Anti-Seize</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Copper</td>
<td>Copper/Graphite</td>
<td>0.16</td>
<td>-30°C to 980°C</td>
<td>N</td>
<td>Copper based formula semi-solid stick</td>
</tr>
<tr>
<td>LOCTITE LB 8070</td>
<td>Heavy Duty Anti-Seize</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Grey</td>
<td>Calcium Carbonate/Graphite</td>
<td>0.16</td>
<td>-30°C to 1315°C</td>
<td>Y</td>
<td>Metal Free, all metals but especially Stainless Steel and Aluminum semi-solid stick</td>
</tr>
<tr>
<td>LOCTITE LB 8150</td>
<td>Silver Grade Anti-Seize</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Silver</td>
<td>Graphite/Aluminum</td>
<td>0.18</td>
<td>-30°C to 870°C</td>
<td>N</td>
<td>Standard Anti-Seize for most applications. Very robust Standard Anti-Seize for most applications. Very robust Aerosol version of LB 8150</td>
</tr>
<tr>
<td>LOCTITE LB 8151</td>
<td>Silver Grade Anti-Seize</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Silver</td>
<td>Graphite/Aluminum</td>
<td>0.18</td>
<td>-30°C to 870°C</td>
<td>N</td>
<td>Standard Anti-Seize for most applications. Very robust Aerosol version of LB 8150</td>
</tr>
<tr>
<td>LOCTITE LB 8507</td>
<td>Nickel Anti-Seize</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>Silver</td>
<td>Nickel/Graphite</td>
<td>0.13</td>
<td>-30°C to 1315°C</td>
<td>N</td>
<td>Best for very high temperature applications. Aerosol version of Product 771</td>
</tr>
</tbody>
</table>

**KEY ADVANTAGES OVER GREASE ALTERNATIVE**

- Allows for disassembly following high temperature service
- Protects from galling and seizure under high stress environment
GAP FILLING SOLUTIONS

BODY FILLERS
During production there is always a requirement to produce a smooth seamless design. Due to material constraints and tolerances, products are required to build up surfaces in order to get a flush finish. This is especially noticeable where FRP parts are bonded to metal parts like end caps. FRP is dimensionally less stable than metal so body fillers are employed in the finishing operation prior to painting.

Henkel offer a wide range of such products, but due to regional chemical regulations each area has a unique offering. Please contact your Henkel representative for the local offering.

POTTING
Many devices require sealing for environmental protection or tamper resistance. In the case of electrical parts, one of the most common requirements is making sure that they are sealed from exposure to water. A common solution is to use a low viscosity material called a potting compound. The low viscosity characteristic of the resin allows it to flow around and encapsulate electronic components within a structure in order to protect them from moisture.

Product selection is based on many requirements such as chemical resistance, process time, accuracy, health and safety, cure time, fixture time, cost, color, etc. Henkel is unique in the market in that we offer options in virtually every major adhesive chemistry which allows us to recommend the best solution for the customer based on specific needs.

OTHER GAP FILLING SOLUTIONS
Henkel is willing to go beyond standard application issues and work with you to solve design challenges that you have never seen before. With our extensive portfolio and experience, it is a core part of our culture to develop innovative solutions.

For more information, please contact your local representative.
Regulatory testing requirements and approvals are in place in order to ensure passenger safety in case of an emergency. Collectively, the testing is known as FST: Fire, Smoke, and Toxicity testing, working towards keeping passengers safe in case of an emergency.

**EN 45545**
This Fire, Smoke, and Toxicity approval applies to the European Union (EU) countries and is one of the most widely used employed standards. It details level of protection, HL1 to HL3. It also covers specific application ranges, referred to as R1 to R26. Qualification is completed to specific application ranges, as no blanket qualification exists. Henkel products meet a number of application ranges within this standard.

**NFPA 130**
This approval is part of the National Fire Protection Association (NFPA) standard 130 which covers passenger rail. It is mandatory in the USA, but adopted in most countries of the Americas, as well as many other parts of the world. Henkel has a range of products that meet this standard as it has a single test for all adhesives.

**BSS 7239**
This Boeing standard is employed for toxicity of gas produced in a fire. No pass/fail criteria exists; testing only requires that a quantitative reading be measured. Henkel can provide the results for a range of products.

**SMP-800C**
This aerospace toxicity of gas produced in a fire test is similar to BSS 7239, but contains a pass/fail criterion. Henkel has data on a range of products.

**ASTM E-1354**
This test is widely used to calculate the heat generated during a fire within a rail vehicle by its manufacturer. Its goal is to determine if a vehicle fire would produce enough energy to damage infrastructure such as a tunnel or bridge, which could cripple a rail line.

**TB/T3139**
This test applies to China only and is a analysis of chemical content. Henkel has data on a range of products.

**Other Regulatory Requirements**
Beyond these tests additional country specific test exist for many other countries such as India, Japan, Russia and others.

RAIL – as part of public infrastructure requires many local and regional approvals. Contact your local Henkel to learn more about regulations in your area.
In addition to offering the **broadest product portfolio** in the adhesives industry, Henkel provides an array of services to help our rail equipment customers **optimize** their manufacturing process, **improve** efficiency and **reduce** overall costs.

**THE FOLLOWING SERVICES ARE AVAILABLE WORLDWIDE:**

**MANUFACTURING EXCELLENCE**

Henkel has decades of success optimizing manufacturing processes. We can analyze your complete manufacturing process and provide tailor-made recommendations on how to reduce production cycle times and rejection rates, thereby lowering your overall costs and increasing your productivity.

**LAB TESTING**

Henkel’s testing capabilities can provide complete data on our product recommendations. Whether you want to analyze a single component of your production process or review the complete system, our labs can provide all the data you need.

**CUSTOMER TRAINING**

Henkel offers a wide selection of customized training programs to help customers learn the details of our product technologies and how to apply them effectively. We can also train you to use our custom-designed equipment efficiently. Our Technology Days provide additional training and demonstrations of our newest innovations.

**VALUE CALCULATORS**

Using our Value Calculators, our adhesives specialists can accurately analyze the total cost of your adhesive processes and determine your savings potential. Simply arrange an appointment with our specialists, and they will visit your production facilities to conduct an in-depth analysis.

**ANALYTICAL SERVICES**

Henkel provides comprehensive analyses of all steps in your manufacturing process using our own industry experts. We will identify problem points on the production line and recommend improvements to the manufacturing process. These services can also include equipment teardowns, surface analysis, and testing.
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