The Seal of Quality

Reliable Sealing Results from High-Quality Impregnation Products and Services
When high-quality metal and electronic parts are required, Henkel is the ideal partner for sealing solutions along the entire automotive value chain.

What the industry needs
High-quality metal and electronic parts play a vital role in the automotive industry. The reliability and safety needs of today’s automotive industry require all parts be fully sealed against fluids, gases and other external influences. At the same time, the automotive industry is confronted with the increasingly demanding challenges of reducing costs, increasing productivity and complying with environmental regulations.

How we can help
As a world-leading supplier of porosity-sealing products and services, we can meet your reliability needs by sealing cast-metal parts and electronic components against leakage. Our sealing solutions can be provided from close-by or on-site impregnation service centers, all of which provide comprehensive evaluations and technical support to meet your sealing needs.

Where our solutions make a difference
At Henkel our mission is to enable our customers to tackle industry challenges with innovative product solutions and services. Our impregnation products and services are designed to provide superior quality for sealing porosities and leak paths in your parts and components. To achieve the highest reliability and quality assurance, we ensure our products are designed to be extremely versatile. They can withstand harsh environments while offering excellent resistance to attack from oils, gases, thermal cycling and other external influences.

Impregnation products and services also help you achieve your cost reduction goals by enabling your operations to run more efficiently, with increased quality accompanying improved productivity. Boasting an ever-expanding global presence at major OEMs and Tier 1 suppliers, Henkel is your ideal partner for sealing solutions along the entire value chain.

How you benefit

Process optimization
› Improved quality and better performance thanks to a best-in-class product portfolio
› Unmatched availability and flexibility from a high-speed impregnation service on-site or close-by
› Exceptional sealing quality thanks to clean, operationally efficient facilities
› Individual validation testing and on-site service staff to ensure tailored product and service concepts

Cost reduction
› Lower overall costs by reducing scrappage due to porosities and other structural defects

Sustainability
› Improved ecological footprint thanks to a recycling system to continuously recover impregnation resin from the wash water
UNMATCHED SERVICE – ON-SITE OR CLOSE-BY

Unique on-site impregnation

Our impregnation service centers offer you a fast and high-quality impregnation service. On-site, with one important advantage – temporary installation of a small but customized impregnation service center directly on site. This on-site solution brings you clear benefits:

> Optimized operation flow
> High-speed service
> Small, flexible and highly qualified Henkel team on site

Alternatively, you can benefit from a Henkel impregnation service center located close to your manufacturing facility. Whichever solution you choose – on-site or close-by – our specialist engineers will work hand in hand with your design, production and quality management staff to discuss every aspect of our impregnation portfolio and agree with you on the ideal solution to meet your specific needs.

Millionfold proof

Henkel guarantees provision of a high-quality, standardized and reliable impregnation service. At our strategically located centers we seal millions of components a year. Moreover, our impregnation centers collaborate closely with our R&D facilities to deliver the best solution for impregnating your parts.
Vacuum Impregnation Products and Services

HOW YOUR METAL PARTS BENEFIT

Added value of impregnation
Impregnation products from Henkel bring added value to your casting process by allowing you to make use of metal parts that would otherwise have to be scrapped due to structural defects. Although metal casting is a highly advanced technology, porosities and other defects can still occur during the manufacturing process. Our products have been developed to deliver consistently clean, leak-proof and sealed parts ready for just-in-time assembly. This applies to all casting alloys, sintered metals, ferrites, ceramics and composite materials.

Outstanding portfolio
Henkel’s complete product portfolio offers impregnation resins, systems and service. Our impregnation products meet the worldwide specification requirements of major automotive OEMs and components suppliers. They offer outstanding characteristics including resistance to chemicals and solvents, high temperature resistance and superior sealing.

Lifetime sealant
The Henkel impregnation sealants and sealing processes cause no damage or distortion to the parts. After impregnation, all parts are clean, free of corrosion or oxidation, and are ready for use without post-treatment. During the life cycle of the treated parts, the sealant will withstand oils (including aggressive synthetic, low-viscosity varieties), grease, virtually all acids, liquid fuels, gases, coolants and solvents. Continuous operating temperatures may range from -90°C to +200°C, while our products can also withstand short-term exposure to temperatures as high as 250°C.

Application examples for castings
- Engine blocks
- Cylinder heads
- Engine covers
- Clutch housing
- Gear boxes
- Pump components
- Filter housings
- Compressor components
- Cooling/oil pumps
Vacuum Impregnation Products and Services
HOW YOUR METAL PARTS ARE IMPREGNATED

With an unmatched portfolio of LOCTITE products and vacuum impregnation systems, we provide permanent and reliable sealing solutions to the problems of porosities and leakages.

LOCTITE Circular Sealing System
Well suited for high-volume, fully automated impregnation solutions, the LOCTITE Circular Impregnation System (CIS) functions in five steps, beginning with the parts being placed in processing baskets and positioned in the CIS loading station. From there, the fully automated processing cycle for impregnation of the parts begins.

Step 1
> Dry vacuum
> Wet vacuum
> Sealant fills porosities, shrinkage cavities, capillary pores and cracks

Step 2
> Drip-off and spin
> Centrifuge removes excess sealant from part surfaces

Step 3
> Washing of parts
> Centrifuge prepares for rinsing step

Step 4
> Rinsing of parts
> Centrifuge prepares for curing step

Step 5
> Curing of sealant within part porosities
> Centrifuge removes surface water and dries parts

/nine.lf/zero.lf°C
With an unmatched portfolio of LOCTITE products and vacuum impregnation systems, we provide permanent and reliable sealing solutions to the problems of porosities and leakages.
Vacuum Impregnation Products and Services
HOW YOUR METAL AND ELECTRONIC PARTS ARE IMPREGNATED

Our unmatched portfolio of LOCTITE products and vacuum impregnation systems has recently been extended to include the LOCTITE Modular Impregnation System (MIS), which is particularly suitable for metal parts and electronic components.

LOCTITE Modular Sealing System
The LOCTITE Modular Impregnation System (MIS) offers production flexibility at an affordable investment price, and can function as a manual system or fully automated robotic system. LOCTITE MIS requires as few as two modules with a footprint of just 82 sq. ft./7.6 m², but can be extended to up to six modules with a capacity of up to 40 cycles per hour.

Fully automated LOCTITE MIS
Module One combines the vacuum impregnation and resin recovery process. Module Two combines the wash and resin cure process, reducing part movement and ensuring the entire part is clean and free of resin contamination.

Manual LOCTITE MIS
The manual version of LOCTITE MIS provides a cost-effective alternative to the fully automated process.

Step 1
- Dry vacuum
- Wet vacuum
- Sealant fills porosity, shrinkage cavities, capillary pores and cracks
- Centrifuge process to remove excess resin from part surface

Step 2
- Rotate and cascade wash of parts
- Rotate and cascade rinse of parts
- Wash away all excess resin from part

Step 3
- Rotate and cascade hot water cure
- Cure the sealant within part porosities
- Rotate and forced air dries parts

90°C
Vacuum Impregnation Products and Services

HOW YOUR ELECTRIC AND ELECTRONIC COMPONENTS BENEFIT

Sealed for good
Impregnation products from Henkel provide the ideal sealing solution for electrical and electronic components. Microscopic voids are inherent in many electronic assemblies, particularly where metals and plastics are assembled together. This can lead to customer complaints, lost production or even lost business. However, our resin solutions seal even microscopic gaps and leak paths in critical electrical and electronic components. Permanently sealing components protects them from moisture, solvents, fluxes and other corrosive agents.

Lasting product improvements
High-performance impregnation products from Henkel are designed for applications requiring greater flexibility and higher temperature and fluid resistance. After the impregnation process, components are clean and unchanged in their dimensions or appearance, and they remain flexible under conditions of thermal cycling. Our solutions allow fast processing of high part throughputs for low unit costs. Impregnation improves the durability and long-term reliability of components with no adverse effect on their solderability or electrical conductivity. Moreover, our innovative sealing solutions eliminate the need for costly and unsightly topcoats.

Industry-approved sealing solutions
Thanks to our unmatched portfolio of sealing resins and a fully automated high-speed vacuum impregnation system, we can offer outstanding sealing solutions for components such as powertrain electronics, connectors, power supplies, heating and air-conditioning systems, alternative energy vehicle (AEV) power generation systems, tire pressure monitoring systems, safety and driver assistance systems, and fuel delivery systems.

Application examples
- Connectors
- Sensors
- Plugs
- Coils and solenoids
- Plastic housings
- Plastic covers
- Overmolded electronics
- Cables
- Wire harness

Step 1
- Pre-process preparation of components

Step 2
- Dry vacuum
- Wet vacuum
- Sealant fills porosities, shrinkage cavities, capillary pores and cracks
- Centrifuge removes excess sealant from component surfaces

Step 3
- Drip-off and spin

Step 4
- Washing of parts
- Centrifuge prepares for rinsing step

Step 5
- Rinsing of parts
- Centrifuge prepares for curing step

Step 6
- Curing of sealant in component porosities
- Centrifuge removes surface water and dries parts

Step 7
- Post-process and packaging

The Seal of Quality
LOCTITE HIGH-PERFORMANCE IMPREGNATION PRODUCTS

Worldwide consistent quality and service offering with technical manufacturing footprints.

Application Area: Castings

<table>
<thead>
<tr>
<th>LIS</th>
<th>Chemical type</th>
<th>Cure method</th>
<th>Appearance</th>
<th>Viscosity 23°C, mPa.s</th>
<th>Chemical resistance</th>
<th>Temperature resistance</th>
<th>Resin recycling</th>
<th>Application area</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCTITE IS 90R</td>
<td>Methacrylate</td>
<td>90°C</td>
<td>Clear, fluorescent</td>
<td>6 – 10</td>
<td>Excellent</td>
<td>-90°C to +200°C</td>
<td>Yes</td>
<td>Castings with typical porosity range</td>
</tr>
<tr>
<td>LOCTITE IS 88C</td>
<td>Methacrylate</td>
<td>90°C</td>
<td>Clear, fluorescent</td>
<td>8 – 10</td>
<td>Excellent</td>
<td>-90°C to +200°C</td>
<td>No</td>
<td>Castings with typical porosity range</td>
</tr>
<tr>
<td>LOCTITE IS 90C</td>
<td>Methacrylate</td>
<td>90°C</td>
<td>Clear, fluorescent</td>
<td>5 – 20</td>
<td>Excellent</td>
<td>-90°C to +177°C</td>
<td>No</td>
<td>Castings with typical porosity range</td>
</tr>
<tr>
<td>LOCTITE IS RTC</td>
<td>Methacrylate</td>
<td>Anaerobic</td>
<td>Clear, fluorescent</td>
<td>5 – 15</td>
<td>Excellent</td>
<td>-90°C to +204°C</td>
<td>No</td>
<td>Sealing macro porosities, powder metal parts with excellent washability performance</td>
</tr>
<tr>
<td>LOCTITE IS AT</td>
<td>Methacrylate</td>
<td>Anaerobic</td>
<td>Clear, fluorescent</td>
<td>5 – 15</td>
<td>Excellent</td>
<td>+177°C</td>
<td>No</td>
<td>Sealing macro porosities and powder metal parts with excellent washability performance</td>
</tr>
</tbody>
</table>

Application Area: Electronics

<table>
<thead>
<tr>
<th>LIS</th>
<th>Chemical type</th>
<th>Cure method</th>
<th>Appearance</th>
<th>Viscosity 23°C, mPa.s</th>
<th>Chemical resistance</th>
<th>Temperature resistance</th>
<th>Resin recycling</th>
<th>Application area</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOCTITE IS 9100</td>
<td>Methacrylate</td>
<td>Anaerobic</td>
<td>Clear, fluorescent</td>
<td>5 – 30</td>
<td>Excellent</td>
<td>-64°C to +177°C</td>
<td>No</td>
<td>Soft and flexible product for electronic parts with leak paths</td>
</tr>
<tr>
<td>LOCTITE IS 9110</td>
<td>Methacrylate</td>
<td>Anaerobic</td>
<td>Clear, fluorescent</td>
<td>36 – 66 at 25°C</td>
<td>Excellent</td>
<td>+200°C</td>
<td>No</td>
<td>Rigid and unrelentless product with excellent chemical and temperature resistance for electronic parts</td>
</tr>
</tbody>
</table>

Vacuum Impregnation Products and Services

HOW YOU BENEFIT FROM OUR LOCTITE IMPREGNATION SOLUTIONS

Loctite Cycle Impregnation System (CIS):
- **Process optimization**
  - Fast processing time and high capacity for impregnating high volume parts
- **Performance**
  - Fully automated system ensures constant high-quality performance
- **Cost reduction**
  - Designed for broad spectrum of parts without costs for specific fixtures
- **Sustainability**
  - Space-saving footprint (645 sq. ft./60 m²)
  - Environment-friendly: recycling performance drastically reduces resin and waste water
- **Safety & Comfort**
  - Enclosure and extraction ensures low noise pollution and emissions to protect employees and hardware
  - Fully automated system ensures high safety level

Loctite Modular Impregnation System (MIS):
- **Process optimization**
  - Best suited for small to mid-sized programs
  - Stainless steel construction with removable panels for easy maintenance access
  - Maximum flexibility for individually adaptable capacities thanks to modular design
  - Fast project responsiveness due to easy build and installation time
- **Performance**
  - Offers in-line design not available with the CIS system
  - Capable of processing parts as large as 30 x 18 x 18 inches (76.2 x 45.7 x 45.7 cm)
- **Cost reduction**
  - Fast lead and installation time
- **Sustainability**
  - Space-saving footprint (less than 82 sq. ft./7.6 m² for small version)
  - Environment-friendly: recycling performance drastically reduces resin and waste water
- **Safety & Comfort**
  - Enclosure and extraction ensures low noise pollution and emissions to protect employees and hardware
  - Fully automated system ensures high safety level

Benefits Electronics:
- **Process optimization**
  - High volume drop-in solution for leakage problems
- **Performance**
  - Intensive cleaning process for cosmetically clean parts
- **Cost reduction**
  - Sealing solution as a service, no investment required
- **Sustainability**
  - Reduces scrap of defect parts
- **Safety & Comfort**
  - Reliable long term solution