

# The Power of Henkel Technologies

Your single, worldwide source of superior adhesives, sealants, and surface treatments

Appliances are complex assemblies that have to meet high customer expectations. That means they must perform flawlessly under demanding operating conditions such as heat, cold, humidity, pressure, vibration, and chemicals.

In order to meet these challenges, Henkel offers a comprehensive collection of high performance products and services for the most demanding appliance applications. In fact, Henkel has the diversity and expertise to offer one-stop solutions across the appliance value chain.

## Surface Treatment Solutions

- Forming/stamping of metal
- Cleaning metal
- Promoting paint adhesion
- Improving corrosion resistance

## Equipment Solutions

- Dispensing systems
- Curing equipment
- Monitoring systems
- Custom development of equipment

## Cleaning Solutions

- Personal hygiene needs (such as hand cleaning)
- Environmental considerations (such as floor cleaners)

## Packaging Solutions

- The protection of goods and surfaces during assembly, manufacture, and transit

## Assembly Solutions

- Joining parts without spoiling the visual appearance of goods
- Making joints impermeable to gases, liquids and solids and resistant to corrosion
- Preventing heat and cold loss
- Providing insulation for sound absorption and vibration dampening

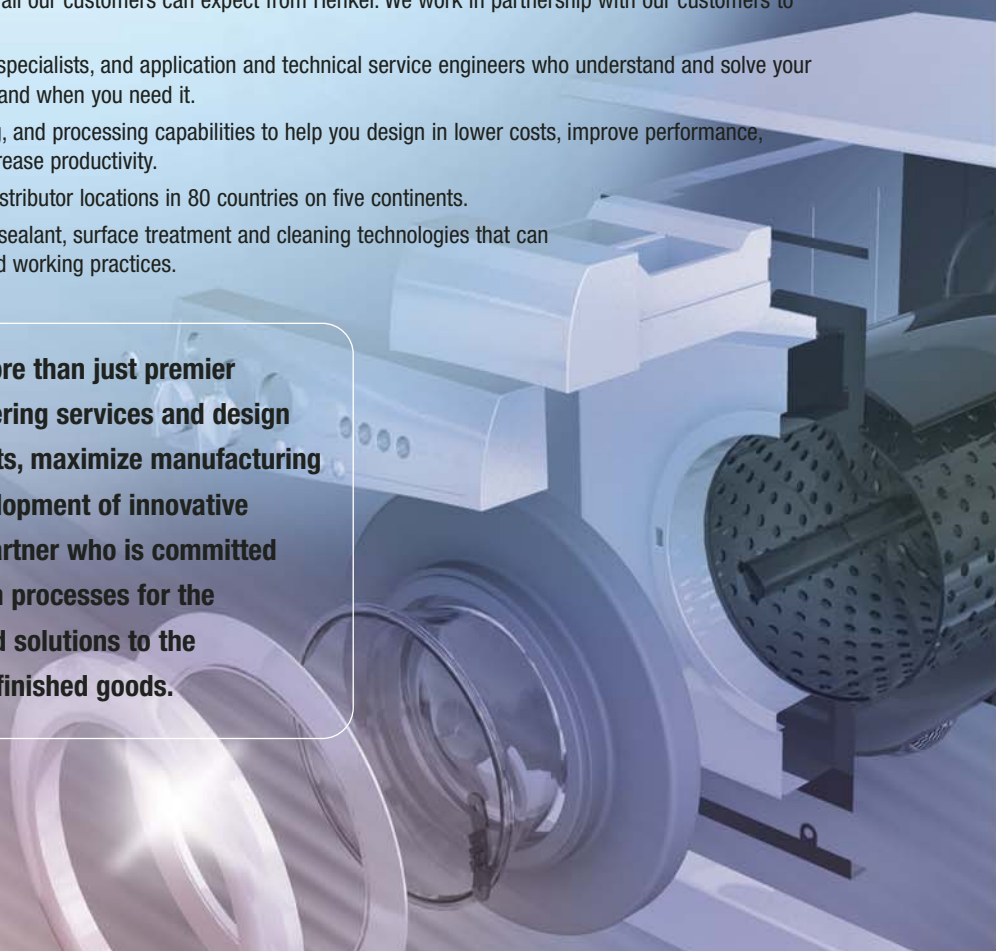
## Continuous Improvement Solutions

- Manufacturing Reliability Assurance
- Chemical Systems Management
- Professional Water Treatment Solutions
- Teardown Analysis

A range of high performance products isn't all our customers can expect from Henkel. We work in partnership with our customers to provide access to:

- Customer service representatives, R & D specialists, and application and technical service engineers who understand and solve your needs, providing unrivaled assistance as and when you need it.
- Sophisticated design, testing, engineering, and processing capabilities to help you design in lower costs, improve performance, reduce maintenance cycle times, and increase productivity.
- Manufacturing facilities and authorized distributor locations in 80 countries on five continents.
- An advanced understanding of adhesive, sealant, surface treatment and cleaning technologies that can deliver lower cost solutions with improved working practices.

**With Henkel, you benefit from more than just premier products. We provide the engineering services and design consultation that will reduce costs, maximize manufacturing efficiencies, and enable the development of innovative appliances. You benefit from a partner who is committed to understanding your production processes for the purpose of providing value-added solutions to the complete manufacturing of your finished goods.**



# Profit from Reliability

## Continuous Improvement Solutions

### Manufacturing Reliability Assurance

It is estimated that maintenance costs contribute 8 to 12 % of the total product cost, which is the most out-of-control controllable expense in a plant. As part of our continuous improvement process for manufacturing reliability, Henkel experts will survey your manufacturing equipment to flag potential problem areas, and audit your plant's air, hydraulic, oil, or steam systems to identify leaks and calculate the toll they are taking on your budget. This process is measured, quantified, and documented through a variety of means including:

- Fewer equipment defects and failures
- Increased operating efficiency for decreased operating costs
- Enhanced product quality
- Greater employee initiative

### Chemical Systems Management

Henkel Chemical Systems Management has a single vision to help our customers reduce chemical usage and overall cost while improving effectiveness and safety. This unique partnership offers full-system support for chemical purchases, inventory management, environmental reporting, and process control. Special benefits include:

- Reduced complexity of product purchasing (one invoice per month)
- Non-core business delegated to a reliable partner (single supply source)
- Modern delivery systems (transparency)
- Total process cost reduction and streamlined logistics and procurement

### The Teardown Analysis

Our engineers can analyze your assemblies and help you build better products faster and more cost effectively. We're able to assist you at any phase of your production process, whether your latest innovations are already coming off the assembly line or are still on the drawing board integrating the following disciplines:

- Concept development
- Cost-out analysis
- Feasibility studies

## Henkel

Can serve as your one-stop supplier, providing adhesives, sealants and surface treatments in all technologies with an unparalleled level of knowledge, innovation and quality, as well as application diversity, reliability and customer support.

Our approach is one of flexibility – enabling us to adapt the solution in order to support your specific cost and service goals. We continuously reinvest in research and development so that we can meet, and in many cases, anticipate our customers' needs and goals.

In addition, our extensive network of technical support centers around the world provides you with unrivaled assistance when you need it.

So, when you work with Henkel, you get a partner who will work with you to find cost-effective solutions to all your manufacturing challenges. From design and product development through simulated testing of your manufacturing process and dispensing trials, no one adds more value to your business than Henkel. **To learn more about Henkel solutions for the appliance industry, log on to [www.henkel-appliance.com](http://www.henkel-appliance.com).**

**Together, we can set the trends for the appliance manufacturing market of tomorrow.**

---

**The data contained herein are intended as reference only. Please contact us for further assistance.**

### Henkel Corporation

Engineering, Assembly &  
Maintenance Technologies

1001 Trout Brook Crossing, Rocky Hill, CT 06067 U.S.A.  
• 800-562-8483 • [www.henkel.us](http://www.henkel.us) • [www.loctite.com](http://www.loctite.com)

### Henkel Canada Corporation

Engineering, Assembly &  
Maintenance Technologies

2225 Meadowpine Blvd., Mississauga, Ontario  
L5N 7P2 • 905-814-6511 • 800-263-5043  
(within Canada)

# Henkel Solutions for the Appliance Industry



# Unique Surface Treatments

Many different processes are used for the pre-treatment of appliance components to clean and work metal, promote paint adhesion and improve corrosion resistance. Some examples are washer and dryer shell stamping lubricants, conversion coatings for high visibility appliances, corrosion and detergent protection for washers and dishwashers, and cleaners for the removal of oils, grease, oxides, pigments, polishing or grinding pastes, oxidation, rust, or scale.

## Surface Treatment Solutions

### Stamping Lubricants

Many different processes are used to press, stamp, bend or pierce sheet metal into the required shapes and forms. One key to success is using the appropriate lubricant to produce a component without breaking or scoring its metal surface. Henkel provides a spectrum of metal forming lubricants.

### Pre-Treatments

Conversion coating is a pre-treatment process that converts a metallic surface to an inorganic surface. The process also chemically transforms a metal substrate into a non-metallic, adhesive bearing surface. The new surface has increased area and energy, improving the overall durability of the surface after it is painted.

Henkel provides a full line of Granodine<sup>®</sup>, Bonderite<sup>®</sup>\*\* and Duridine<sup>®</sup> pre-treatments for multi-metal or specific metal applications. Our pre-treatment product line includes cleaners, activators, zinc phosphates, iron phosphates, and final passivation.

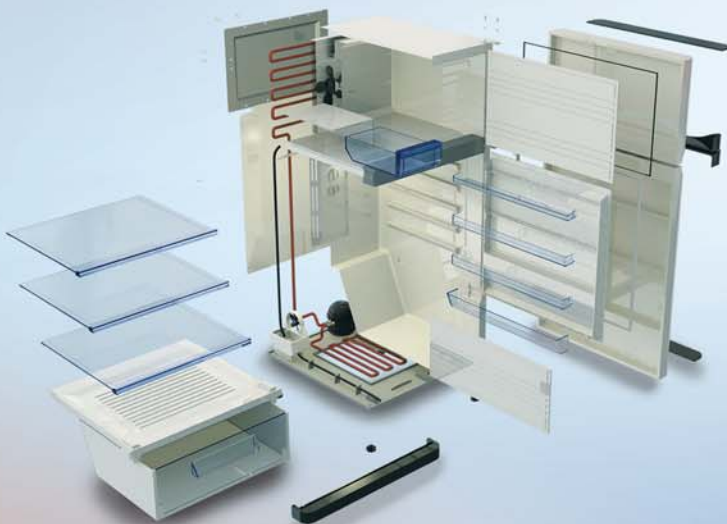
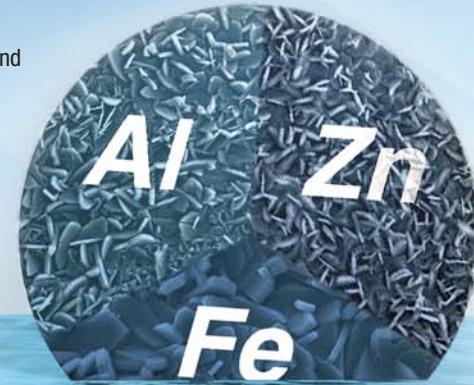
Henkel also offers the ACC<sup>®</sup> line of coatings which offer corrosion protection on surfaces by means of autodeposition and without the use of electrical current. Because of a self-deposition process, our ACC<sup>®</sup> coating has the unique ability to coat wherever it wets, without limitations by electric field distribution.

\* Bonderite<sup>®</sup> is not available in all countries until 2005. Please contact your local Henkel representative for availability in your country.

## Cleaning Solutions

Whenever metals have to be prepared for additional process steps such as pre-treatment, galvanizing, coating or enameling, they first need to be thoroughly cleaned and degreased.

Henkel offers a comprehensive range of Ridoline<sup>®</sup> and alkaline, neutral and acid P3<sup>®</sup> cleaners for such purposes.



Refrigerator

## Application Areas & Examples

### Cleaning

- Metal
- Glass
- Plastic

### Metal Bonding

- Magnets on motor
- Compressor to pan
- Support brackets on cooktops

### Plastic Bonding

- Knobs on control panel
- Door handles
- Name tags
- Laminated panels to ABS or PS frames
- PVC to glass shelves
- Door assemblies
- Door seals



Dishwasher

# Advanced Adhesives and Sealants

## Assembly Solutions

The design and manufacture of appliances poses numerous assembly, mounting, fastening and sealing challenges. These not only involve the manufacture of goods, but also their long term durability and maintenance needs.

Henkel adhesives and sealants have been specified by the world's major appliance manufacturers for more than 30 years.

### Hysol® and Technomelt® Hot Melt Adhesives

Used for bonding a variety of substrates, including difficult-to-bond plastics. They are ideal for applications that require high-speed manufacturing, bonding versatility, very large gap filling, fast green strength, and minimal shrinkage. These products are solvent-free and contain environmentally friendly materials with no harmful VOCs.

### Terostat® Adhesives and Sealants

Include butyl and polyisobutylene plastic systems used for foam stop or sound dampening applications and MS polymer food compliant elastic adhesives and sealants.

### Loctite® Engineering Adhesives and Sealants

The respected name when it comes to high technology engineering applications in the appliance industry. There are adhesives which lock and seal threaded fasteners and fittings, join plastics, metals, glass and other substrates, or retain bearings and cylindrical assemblies. In addition, we provide a broad range of adhesives and sealants, including anaerobics, acrylics, cyanoacrylates, epoxies, light cures, silicones and urethanes, to meet a variety of application requirements.

### Macroplast® Polyurethane Adhesives

Various one and two-component polyurethanes and reactive hot melts for structural bonding of components. Typical applications include the bonding of top lids on washing machines and refrigerators.

### Macromelt® Low Pressure Molding Adhesives

Thermoplastic hot melts based on polyamide for injection moulding. This product range is used for electronic component enclosure to protect against moisture and mechanical stressing, and includes the sealing, insulating and fixturing of harnesses and connectors.

#### Pre-Treatment

- Phosphating:  
Shell/cabinet  
Door & unit parts
- Autodeposition Coating:  
Unit parts

#### Potting & Encapsulating

- Connectors
- Armature windings

#### Threadlocking/Sealing

- Fasteners & fittings
- Dishwasher blades
- Hinges on door assemblies
- Fittings on gas dryers and washers
- Compressors
- Fan motors

#### Stamping, Forming, Cutting Lubricants

- Shells/cabinets
- Doors

#### Low Pressure Molding

- Connectors
- Control panels

#### Thermal Transfer

- Refrigerator & freezer liners
- Range & cooker

#### Retaining

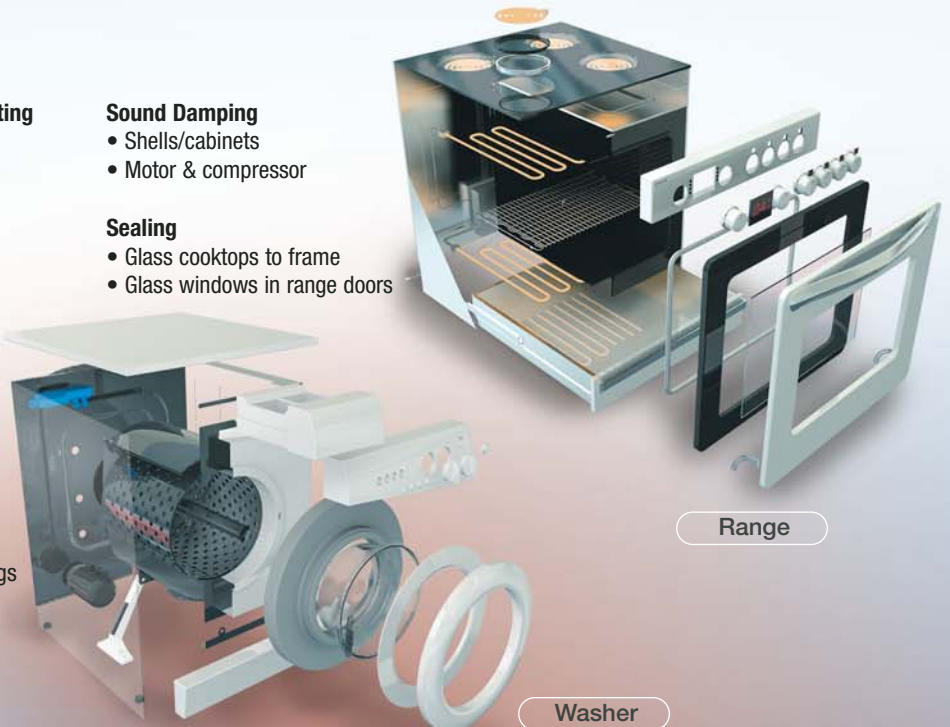
- Gear shafts
- Slip fit bearings/bushings
- Spin pinions
- Copper tubing

#### Sound Damping

- Shells/cabinets
- Motor & compressor

#### Sealing

- Glass cooktops to frame
- Glass windows in range doors





## Equipment Solutions

### Dispensing

Henkel provides a complete line of dispensing equipment, ranging from simple, hand-operated dispensers to fully automatic systems, including a complete line of accessories.

### Curing

Henkel offers light curing systems for spot, batch and continuous applications. Each system offers flexibility and appropriate safety features. A full line of accessories, including radiometers, replacement bulbs, and UV safety glasses are also available.

### Monitoring

State-of-the-art detection systems are also available from Henkel that allow real-time process monitoring of dispense cycles. Whether you are looking to determine the presence of adhesive via fluorescence detection, or the amount of adhesive dispensed for an individual dispense nozzle, Henkel has the monitoring system to get the job done.

### Custom Equipment

Henkel can modify any of our standard dispensing or curing systems, or custom-develop a system, which combines our technology with your current manufacturing process.

## Packaging Solutions

Whether you are sealing a box, palletizing a load or seeking a new packaging solution, Henkel offers a wide range of suitable hot melt adhesives for the task.

Exposed to harsh temperature changes during transportation, packaging adhesives must perform perfectly in all climate conditions, and bonded packages must withstand a wide range of stresses before they are opened by the consumer.

**Tell us about your requirements, and we'll provide the solution.**

