

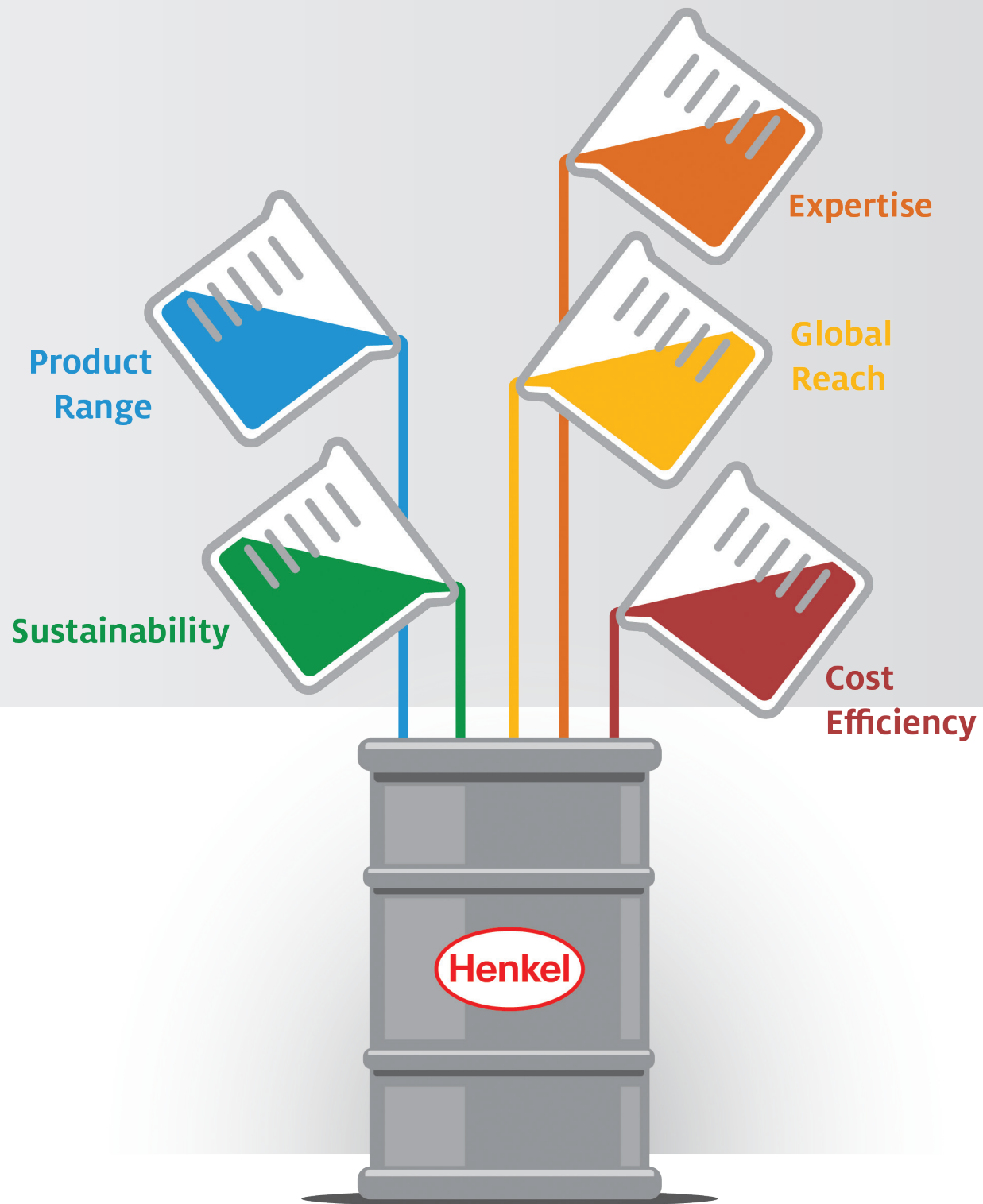
BONDERITE®

Cleaners & Lubricants

Metalworking and Metal Forming Applications



Henkel



Smart solutions start with the right formula

Henkel's leadership and capability in Cleaners and Lubricants provides access to global reach, 140 years of expertise, and extensive product range - plus cost efficiency and sustainability - helping to create an ideal solution for metalworking and production challenges.

Henkel's full line of specialty products are available for a variety of application areas, including:

- Machining and Grinding
- Forging
- Die Casting
- Rust Preventatives and Parts Cleaners
- Cold Forming
- Stamping and Drawing
- Surface Treatment

Achieve lower overall process costs, while achieving superior results, with Henkel quality solutions from using BONDERITE® branded technologies.

LUBRICANTS

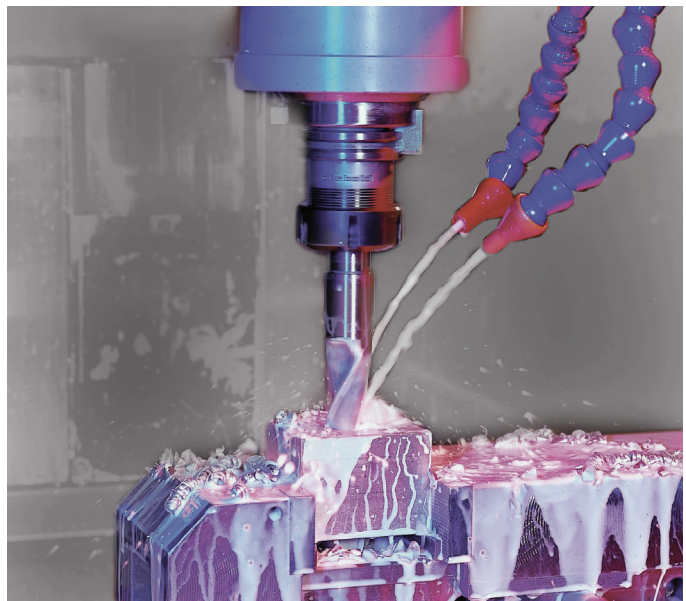
MACHINING & GRINDING

Henkel's BONDERITE® metalworking fluids are designed to be used on steel, cast iron, aluminum and other non-ferrous alloys in a variety of markets, from general industrial to automotive. From straight oils to synthetics, our products for metal removal contain the necessary ingredients that meet the needs of light to heavy duty industry applications.

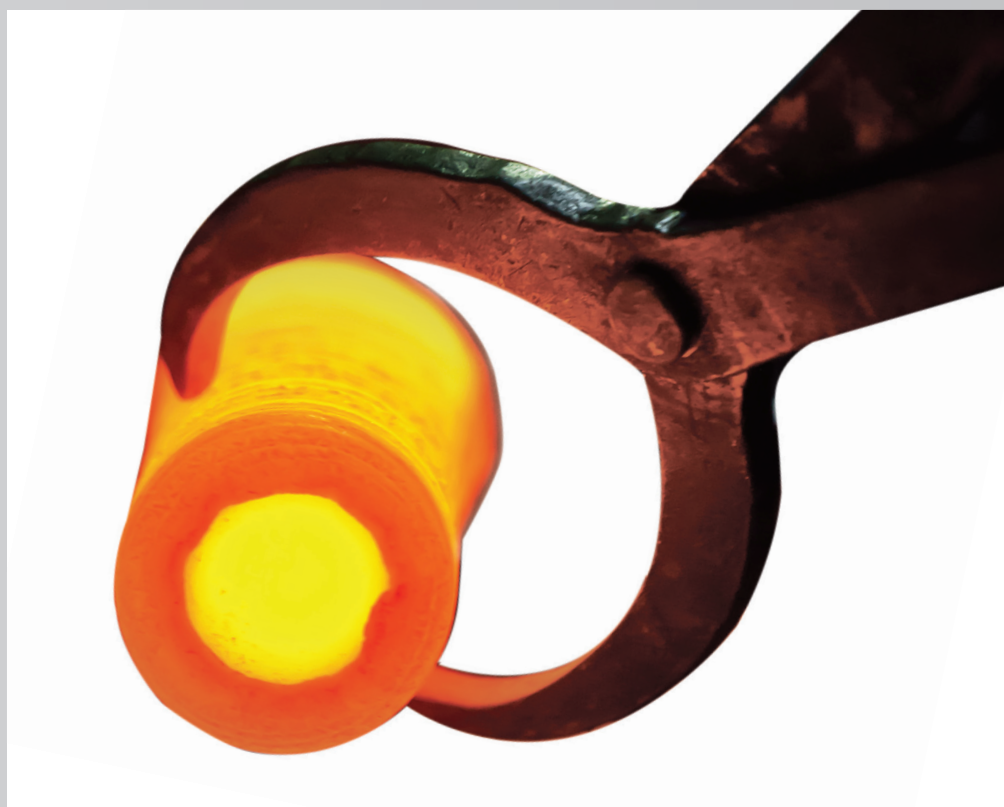
High-quality BONDERITE® metal removal products for cutting and grinding are available in a variety of chemistries, including straight oils, soluble oils, semi-synthetics or synthetics.

Key product lines include:

- **BONDERITE® L-MR B Series** bio resistant, semi-synthetic, metal cutting lubricants with extreme pressure and lubricity additives used for light to heavy applications.
- **BONDERITE® L-MR CR Series** provide a durable product for light to heavy applications. Designed for machining and grinding ferrous and non-ferrous alloys.
- **BONDERITE® L-MR Synthetics** are designed for machining, grinding and roll-forming ferrous and non-ferrous alloys.



LUBRICANTS



FORGING

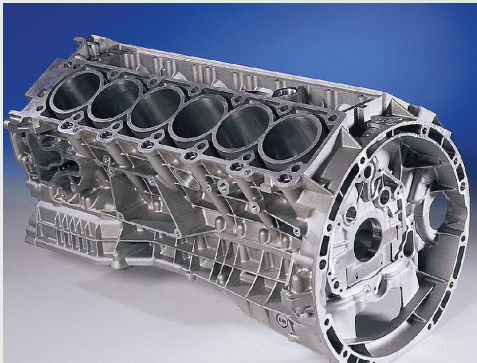
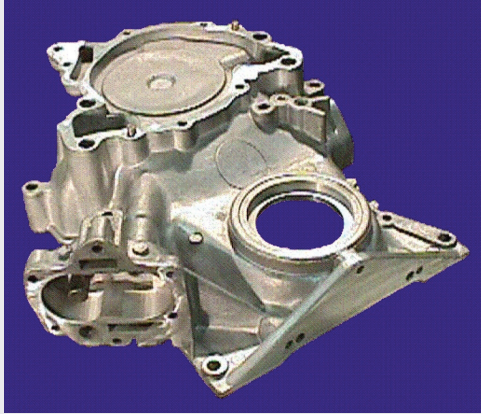
Henkel's forging lubricants bring value throughout forging operations. Through the BONDERITE® L-FG product portfolio, Henkel offers an extensive line of lubricants for hot, warm and precision forging processes. These products are designed to perform under extreme temperatures and pressure. In addition, Henkel offers synthetic and hybrid products specifically formulated to replace graphitic products, while providing lubrication and protection to tooling on even the toughest forgings.

From forging to extrusion and drawing of steels, non-ferrous metals and difficult-to-work super alloys, Henkel's BONDERITE® die lubricants and release agents are outstanding performers under the most extreme conditions of temperature and abrasion. Features and benefits include:

- Extended die life
- Enhanced part quality
- Increased productivity and efficiency

Look to Henkel for innovative technologies and support to keep forging operations running smoothly.

LUBRICANTS



DIE CASTING

Henkel offers a variety of coating lubricants, formulated for high pressure, gravity and low pressure die casting applications. The BONDERITE® L-CA product line is formulated for casting of aluminum and other non-ferrous metals.

Whatever the process, these lubricants offer a competitive edge by providing:

- Superior lubrication and release
- Cost-effective dilution ratios
- Cleaner castings
- Improved surface finish
- Best-in-class thermal fatigue protection

Henkel's leading die casting technology can help maximize profits by increasing productivity and improving part quality.

RUST PREVENTATIVES & PARTS CLEANERS

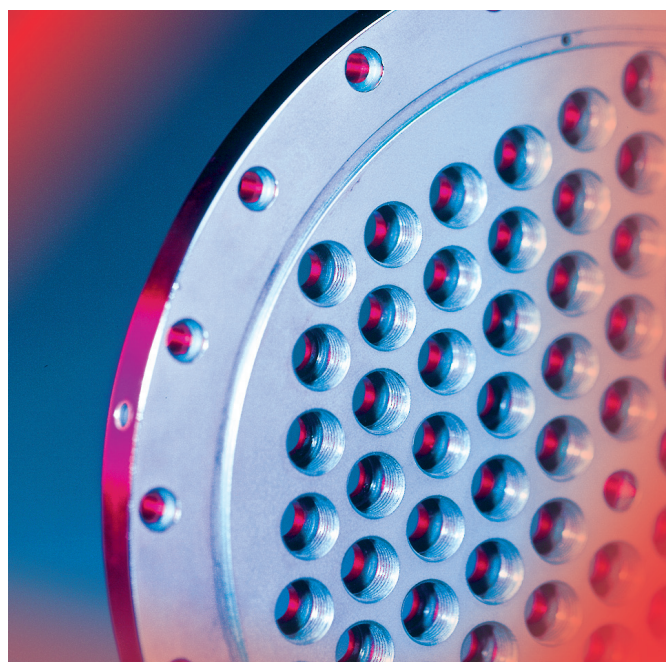
The unique composition of alkalinity, corrosion inhibitors and surfactants provides a durable low foaming, hard-water-stable product for today's light to moderate duty cleaning and protecting needs. These cleaners are ideal for removing oils and emulsions, drawing compounds, metal chips and pigment off the surface of machined or pressed parts.

Henkel provides a range of neutral cleaners with corrosion protection, including:

- **BONDERITE C-NE Series**, are neutral-based, in-process cleaners with corrosion inhibitors designed for short-term corrosion protection of ferrous and aluminum alloys. Its unique composition provides a durable, hard-water-stable product for cleaning and protection.
- **BONDERITE® L-GP Series** are corrosion inhibitors designed for short to moderate term protection on ferrous to non-ferrous alloys. Its unique composition provides a durable, low-foaming product with a non-tacky film.

Additional benefits include:

- Simple bath maintenance and long bath lifetime means improve economic efficiency
- No expensive additives required
- Good defoaming properties
- Multipurpose cleaner for steel, cast iron, aluminum alloys and non-ferrous/yellow metals

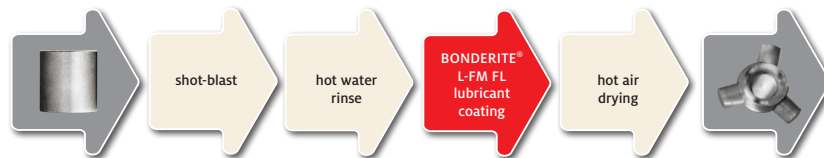


METAL FORMING

The conventional way: Numerous steps to cold extrusion



The BONDERITE® L-FM FL way: Only a few steps to cold extrusion



COLD FORMING WITH TECHNOLOGY

Our BONDERITE® family of lubricants address the most difficult forming applications. This technology is proven throughout the industry to perform with the consistency and quality to develop high quality parts. The BONDERITE® L-FM FL series of dry film polymer lubricants is a sustainable response to the traditional and time consuming phosphating process. An alternative to reactive and non-reactive soaps, these water-based, dry-in-place coatings are compatible with traditional pretreatment technology. These dry film products offer advantages that address the shortcomings of phosphate and soap. BONDERITE® L-FM FL is a one-coat, non-reactive coating that reduces process steps, and is flexible enough to be applied in a batch process, as well as in an in-line process.

BONDERITE® L-FM FL benefits include:

- Increased process efficiency
- Prolonged tool life
- Reduced energy consumption
- Easy bath control

METAL FORMING

STAMPING & DRAWING

Henkel's full line of quality stamping and drawing products are available in a variety of chemistries including straight oils, emulsions, synthetics or dry films.

Key product lines include:

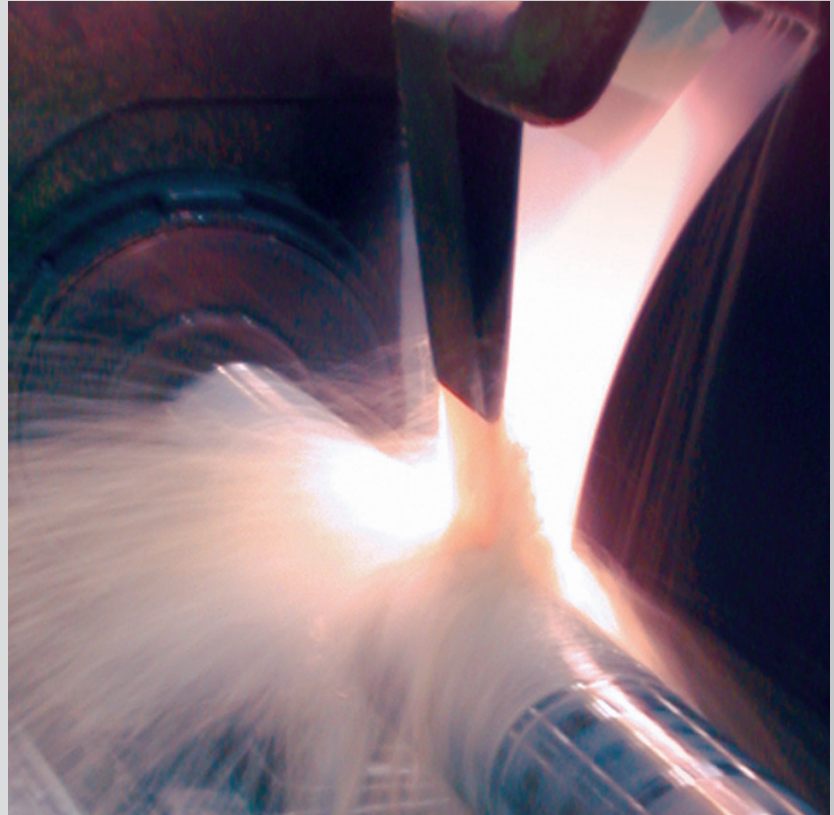
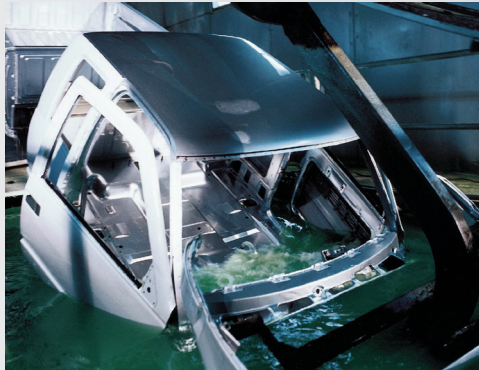
- **BONDERITE® L-FM F Series** is developed with a unique composition of corrosion inhibitors, extreme pressure and lubricity additives, which provides a durable product for drawing operations.
- **BONDERITE® L-FM PL Series** is designed for a variety of stamping operations where a straight oil is required. These products feature BONDERITE® L-FM PL 101, which acts as a light stamping product with multiple automaker approvals and also operates as an extended corrosion preventative.

Overall advantages of BONDERITE® products:

- Consistent tooling performance
- Multi-metal application
- Excellent lubrication
- Extend system life
- Improve quality



SURFACE TREATMENTS



SURFACE TREATMENTS

With cleaners to wash away dirt, pickling baths to drive out metallic scale and lubricants to enhance even the most complex drawing operation, Henkel has each step covered. Leading products include:

- BONDERITE® conversion coatings which are available in several chemistries, including iron, manganese and zinc-phosphate. These coatings help to improve corrosion resistance and anchoring of applied lubricants.
- BONDERITE® pickling inhibitors remove the metallic scale, while protecting the metal surface.

Benefits include:

- Increased corrosion protection
- Increased productivity and efficiency
- Improved quality
- Reduced overall process costs
- Longer system life



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