



Special lubricants
for cold forming operations



Cold forming oils and multi-function oils for cold forming

BECHEM – Lubrication solutions for industry







As the oldest German manufacturer of industrial lubricants, BECHEM is one of the leading producers of high-quality special lubricants and metalworking fluids today.

BECHEM products stand out through innovative formulations in the most diverse industrial applications – in machining and forming for metalworking processes, in coating technology and as for-life lubricants in various technical components.






A strong network of distributors and several national and international production sites ensure that BECHEM products are readily available worldwide.

Tomorrow's technologies. Today.

APPLICATIONS

- Cold forming 
- Fine blanking 
- Deep drawing 
- Punching 
- Bending 
- Wire drawing 

PROPERTIES

- Chlorine free 
- Corrosion protection 
- Good rinsing performance 
- Extended tool life 
- High temperatures 

All indications and values correspond to latest knowledge and do not represent any product specification

Lubricant solutions for the entire process chain

Everything from one source: BECHEM system solution provides for maximum efficiency and performance over the entire process chain. From toolmaking to wire drawing, cold forming and machining, down to cleaning and corrosion protection, BECHEM develops finely tuned product series.

BECHEM lubricant solutions optimize processes along the entire process chain. Extended service lives reduce maintenance, increase productivity and continuously optimize processes.

This and fewer suppliers mean lower costs and more efficient lubricant application. BECHEM fluid management supports responsible employees on site, offering added value in terms of security and reliability in production. Optimal fluid management can be crucial when it comes to the functioning and life cycle of your machine fleet. Cost-intensive damage and machine downtimes can be prevented. BECHEM application engineers provide consultation on monitoring and proper application of various lubricants.

Development expertise and service

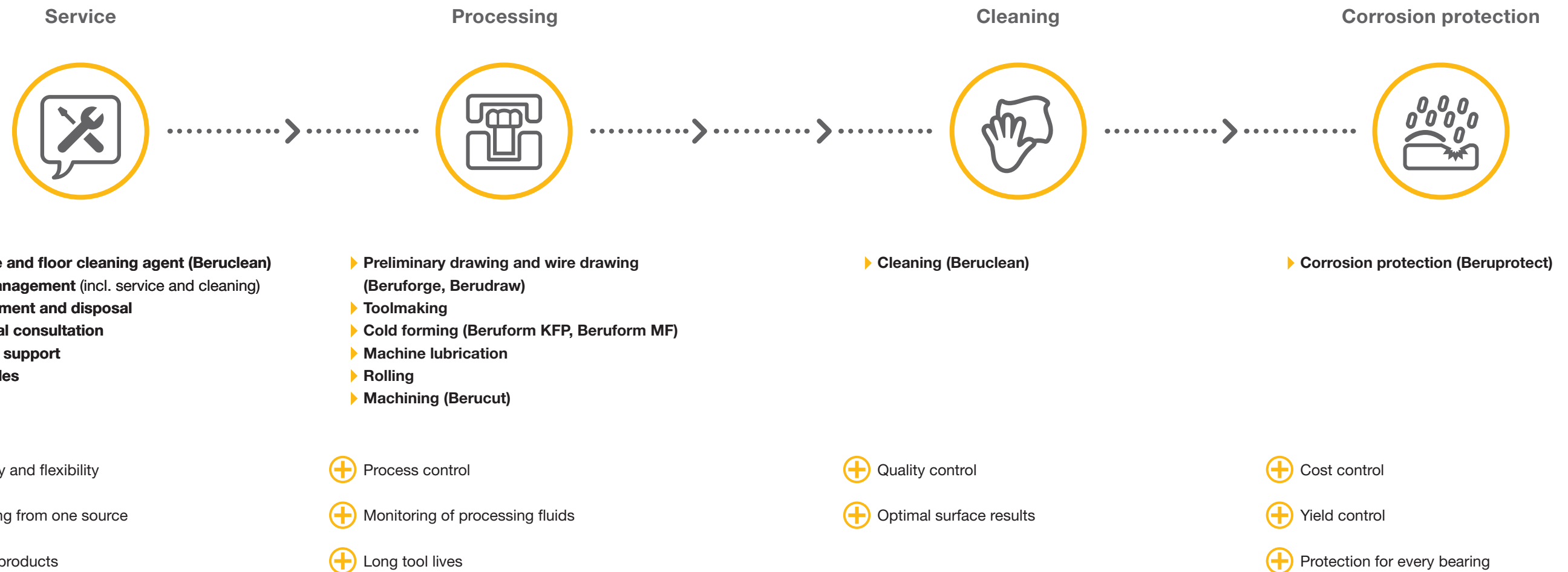
At BECHEM technical center are available the latest chemical-physical testing and analysis systems, that are used to characterize lubricants, to monitor their application, to analyze customer problems and eventually to develop the appropriate lubricant solutions. State-of-the-art testing helps simulate the different conditions under which lubricants are used across the world.

In many applications and components, lubricants and lubrication systems are a key component in development, and cannot be considered separate from the respective project. Product success hinges on lubricants tailored to the requirements profile. Powerful analysis is crucial here.

The performance capacity of the products used and the technical service are crucial for the quality of the work-pieces. BECHEM specialists have the necessary expertise to provide individual consultation to users and to assess the effectiveness of system solutions.

The BECHEM service department ensures the continuous improvement of processes:

- Inventory/analysis on site
- Analysis at the BECHEM technical center
- Development of customized system solutions
- Extensive tests in the work process
- Process-oriented technical support
- Optimized service life
- Improved working conditions for users
- Full fluid management



Multifunctional oils for cold forming operations



There are two main challenges in cold forming on modern multi-stage presses:

The construction design of certain types of presses does not allow a separation between cold forming oil and machine oil. The use of conventional machine oils for cold forming will then lead to considerably increased tool wear due to the low level of high-pressure additives.

Even if presses are used which allow the separation between machine, slideway and cold forming oil, oil mixtures caused by leakages can never be totally excluded. This problem especially occurs with older machines. The additive level will drastically decrease due to dilution (mixture) whereas viscosity rises (increased drag-out losses). Finally, the performance loss will lead to premature oil change.

With the concept of multifunctional oils BECHEM offers an optimal and approved solution. The BECHEM multifunctional oils are products which ideally support both the forming process and machine lubrication.

The use of oil eliminates the problem of undesired mixing. A constantly high additive level and a consistent viscosity will thus be guaranteed.

In various practical tests (1.000 hours and more) on four and five stage presses identical or even longer tool life could be achieved with BECHEM multi-functional oils than with conventional lubricants. The oil changing intervals could in any case be considerably extended (50 – 100 %). Based on their well balanced additive content the BECHEM multifunctional oils are also suitable for forming non-ferrous metals.

Products for cold forming operations

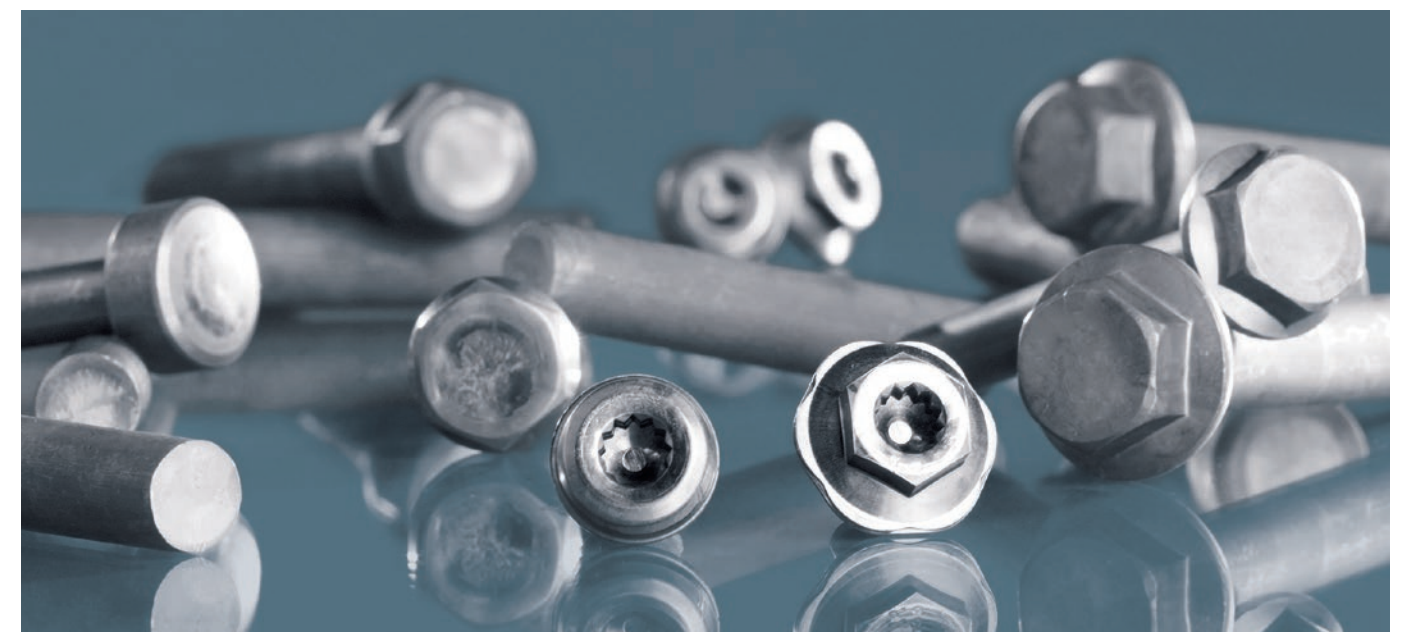
In cold forming processes of metal materials (e.g. steel, non-ferrous metals, aluminum) preferably pretreated work pieces have to be pressed into a defined form under considerable deformation forces. Depending on the geometry of the finished part and the material, several forming steps can be required.

The extreme surface pressures between tool and work piece require high-performance forming agents which are able to build up high-pressure resistant layers during the forming process in order to prevent premature wear, fretting or even breaking of the tools. For decades, the consequent and continuous development and improvement of forming products in close cooperation with users, machine and tool manufacturers set the standard for most demanding cold forming oils.

BECHEM offers tailor-made products for all forming tasks:

- Production of standard screws, solid, hollow and semi-hollow rivets
- All types of forming processes; for extrusion and cupping operations
- Products for demanding forming operations of tempered and high-quality steels
- Additive packages and forming additives

» An optimized forming medium enables efficient production processes. «



For demanding cold forming processes

With BECHEM media for cold forming, you can rely on state-of-the-art, chlorine-free and continually advanced products for the most demanding of cold forming processes. Tailored to products along the entire process chain, they offer major added value: Cost savings, extended service lives, reduced maintenance and boosted productivity.

With an extensive product range we are able to cover your entire lubricant requirements:

- Cold forming and forming oils
- Gear and hydraulic oils
- Multifunctional oils
- Water miscible coolants
- Cutting and rolling oils
- Drawing lubricants: oils, emulsions and soaps
- Cleaning agents
- Anti-corrosion oils
- Machine cleaning and other services, complete fluid management upon request

» Higher performance, higher efficiency. «

PRODUCT	TECHNICAL DATA			APPLICATIONS					Description
	Kinematic viscosity [mm ² /s] at 40 °C	Polar additives	EP-additives	Steel	Stainless steel	Aluminum	Copper	Brass	
Cold forming oils Beruform KFP 10 Beruform KFP 49 Beruform KFP 95 Beruform KFP 96 Beruform KFP 96 HC Beruform KFP PP-Z	64	oo	oooo	•	•				Cold forming oil for high requirements, such as very deep cupping operations, very long reductions of high-alloyed steels, application by immersion or spray devices
	34	o	oo	•					Cold forming oil for easy to medium forming processes on single and multiple stage presses, high tool life, long service life in the coolant tank
	90	ooo	ooo	•	•				Cold forming oil for very demanding, multi-stage forming of high-tensile carbon steels and alloyed steels, high tool life, long service life in the coolant tank
	91	ooo	oooo	•	•				Like Beruform KFP 95 , however with a higher performance
	84	oooo	oooo	•	•				Cold forming oil for extreme requirements with a high additive content, especially suitable for high-tempered steels and stainless steels, considerably reduced formation of residues on formed parts
	105	ooooo	ooooo	•	•				Cold forming oil with an extremely high additive and solid lubricant content, excellent tool life with excellent surface qualities, also suitable for replacing chlorine containing products
Multifunctional oils Beruform MF 105-100 Beruform MF 148 NEU Beruform MF 148-68 Beruform MF 85 Beruform MF 155 Beruform MF 1136 B Beruform MF 1146 Beruform MF 1167 B	100	o	o	•		•	•	•	For easy to medium forming processes of steel and brass, also suitable for as machine oil and bed track oil, as well as press oil with minimal tool wear
	110	ooo	ooo	•	•	•	•	•	Cold forming oil with a high additive content for multiple stage presses, multifunctional use as machine and forming oil providing constant additive and viscosity level
	64	ooo	ooo	•		•	•	•	Like Beruform MF 148 NEU , however with viscosity grade 68
	98	oo	oo	•		•	•	•	Multifunction oil with a high additive content for cold forming on multiple stage presses, extremely resistant to ageing, improved flushing performance and optimum lubrication properties
	110	ooo	ooo	•	•	•	•	•	Like Beruform MF 85 , however with better performance
	110	ooo	ooo	•	•	•	•	•	Multifunction oil with high additive content for demanding cold forming processes
	110	ooo	ooo	•	•	•	•	•	Multifunctional oil with high additive content for most demanding cold forming processes, high evaporation resistance and high flashpoint allow forming processes at very high forming temperatures
	110	ooo	ooo	•	•	•	•	•	Multifunctional oil with high additive content for most demanding cold forming processes, especially suitable for products coated with Beruforge
Additives and forming agents Beruform KFP 22 Beruform KFP 22 P Beruform KFP 810	-	ooooo	ooooo	•	•				Cold forming oil with extremely high additive content for demanding forming processes, applied pure for complicated work pieces or as additive package to increase the performance of conventional forming oils
	pastös	ooooo	ooooo	•	•				Pasty concentrate of active ingredients, auxiliary material for the most difficult forming processes, can also be used as drawing paste in preliminary drawing devices for drawing of cold heading wires
	205	ooooo	ooooo	•	•				Cold forming oil for demanding high-temperature applications, most demanding forming processes on multi-stage presses, pre-heating, long tool lives, good corrosion protection

o low ooooo very high

Innovative wire drawing methods

Beruforge 150 series – phosphate-free wire coating

The **Beruforge 150 series** single-layer system was developed for modern energy- and resource-efficient wire drawing. To date, phosphating semi-finished products in forming technology (Singer patent) still represents the common state-of-the-art. This method is very disadvantageous, as it requires a great deal of energy and chemicals, which have to be disposed of properly after use. Modern requirements demand alternative production processes without phosphate. As part of a joint project, multiple alternative lubrication systems were developed and tested, ultimately resulting in an innovative coating method superior to all previous phosphate-systems – the Beruforge 150 single-layer system.

The Beruforge 150 series meets all tribological requirements in cold forming, characterized by high relative speeds between the tool and workpiece, high surface pressures and major surface expansion. Friction and forming processes result in temperatures of up to 500°C. These framework conditions require very complex lubrication systems in cold forming that prevent direct contact of metal between the tool and workpiece. The Beruforge 150 series meets these requirements, offering an excellent separation effect, high lubrication and enabling surface qualities that do not require extra machining.

The Beruforge 150 series is extremely successful on the market, allowing for phosphate-free wire coating that until now was only possible with lubricants containing phosphate.

With this innovative product series offering major advantages in production, you can forego lubricants containing phosphate completely



Everything from one source

BECHEM Avantin – water-miscible coolant lubricants

BECHEM Avantin is a product series of water-miscible coolant lubricants. Complex processes demand excellent coolant lubricant performance with maximum efficiency, lasting stability and a long service life, made possible thanks to BECHEM's engineering expertise and a modern system structure. Clean machines that are protected against corrosion are a matter of course.



Berucut XC – non-water miscible coolant lubricants

The continuously growing demands in metal processing require more and more high performance fluids. The non-watermiscible **Berucut XC** series is the new trend-setting generation of BECHEM coolant lubricants tailored to the wide range of processed materials. Berucut XC is ideal for minor to major machining operations, such as turning, drilling, milling, thread cutting, grinding, broaching or sawing.

Cleaning and corrosion protection

The right one for the job: **Beruclean**. The selection of the best-possible cleaner depends on the material to be cleaned, the system technology used and the type of impurities. For different materials and cleaning methods, the Beruclean series offers both aqueous and solvent-based products for the residue-free cleaning of any process fluids in metal-working.

The foundation for perfect protection: **Beruprotect**. Extreme corrosion influences act on the manufactured components, such as semi-finished products or vehicle components, during long international transport routes and storage times.

Machine and floor cleaning

Cleaning agent for the highest requirements: **Beruclean**. These products are characterized by excellent cleaning results and a low-consumption formulation. They also ensure maximum economy, optimized performance characteristics and excellent efficiency.

The Beruclean cleaning agents have been developed specifically for scrubber vacuum machines as well as high-pressure and steam jet tools, but they are also ideal for manual cleaning processes as well as for coolant lubricant changes, new use and maintenance.



Lubrication solutions for industry



CARL BECHEM GMBH

Weststr. 120 · 58089 Hagen · Germany · Phone +49 2331 935-0 · Fax +49 2331 935-1199 · bechem@bechem.de · www.bechem.com