

BERUFORM KFP – Cold forming oils
BERUFORM MF – Multifunctional oils



Products for cold massive forming operations

In cold massive forming processes of metal materials (e.g. steel, non-ferrous metals, aluminium) preferably pre-treated 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 necessary.

The extreme surface pressures between tool and work piece require high-performance forming agents which are able to build up pressure-resistant layers during the process in order to prevent premature wear, fretting or even breakage of the tools.

For decades, the consequent and continuous development and improvement of the forming products in close cooperation with users, machine and tool manufacturers sets the standard for most demanding cold forming oils.

BECHEM offers tailor-made products for all fields of forming technology:

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



Product	Viscosity (mm ² /s) at °C	Flash point in °C	Materials to be processed	Polar substances*	EP-additives*	Properties
Production of standard screws, solid, hollow and semi-hollow rivets						
BERUFORM KFP 49	36	> 170	Steel	+	++	Cold forming oil for easy to medium forming processes on single and multiple stage presses, allows extended tool life and long service life in the coolant tank
Extrusion and cupping operations						
BERUFORM KFP 10	64	> 180	Steel	++	++++	Cold forming oil for high requirements, e.g. very deep cupping operations, very long reductions of high-alloyed steels, for immersion and spray lubrication
BERUFORM KFP 13 R	103	> 180	Steel	++	+++	Forming oil for demanding cold massive forming of low / high-alloyed steels, for immersion and spray lubrication, high-performance AW/EP additives, extended tool life
Forming operations of tempered steels and stainless steels						
BERUFORM KFP 95	90	> 135	Steel, stainless steel	+++	+++	Chlorine-free cold forming oil for very demanding, multiple forming of high-tensile carbon steels and alloyed steels, extended tool life, long service life in the coolant tank
BERUFORM KFP 96	91	> 170	Steel, stainless steel	+++	++++	See BERUFORM KFP-95 , however with a higher performance
Demanding forming operations of tempered steels and stainless steels						
BERUFORM KFP 96 HC	80	> 180	Steel, stainless steel	++++	++++	Cold forming oil for extreme requirements with a high additive content, especially suitable for high-tempered steels and stainless steels, considerably reduced crack formation on formed parts
BERUFORM KFP 95 HP	120	> 160	Steel, stainless steel	++++	++++	Cold forming oil for extreme requirements with a high additive content, contains polar substances, active sulfur compounds and special AW-additives, also suitable for minimum quantity spray systems
BERUFORM KFP PP-Z	115	> 180	Steel, stainless steel	+++++	+++++	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 105-68	68	> 210	Steel, aluminium, copper, brass	+	+	For easy to medium forming operations of steel and brass, also suitable as machine and slideway lubricating oil, to be used as forming oil with low tool wear
BERUFORM MF 105-100	100	> 240	Steel, aluminium, copper, brass	+	+	See BERUFORM MF 105-68 , however with viscosity grade 100
BERUFORM MF 148 NEU	110	> 200	Steel, stainless steel, aluminium, copper, brass	+++	+++	Chlorine-free cold forming oil with a high additive content for cold massive forming on multiple stage presses, multifunctional use as machine and forming oil, constant additive and viscosity level
BERUFORM MF 148-68	68	> 185	Steel, aluminium, copper, brass	+++	+++	See BERUFORM MF 148 NEU , however with viscosity grade 68
BERUFORM MF 85	110	> 200	Steel, aluminium, copper, brass	++	++	Chlorine-free multifunctional oil with a high additive content for cold massive forming on multiple stage presses, extremely resistant to ageing, improved rinsing performance and optimised lubrication properties
BERUFORM MF 155	110	> 200	Steel, stainless steel, aluminium, copper, brass	+++	+++	See BERUFORM MF 85 , however with better performance
Additives and forming agents						
BERUFORM KFP PP	69	> 160	Steel, stainless steel	++++	++++	High-performance cold forming oil and additive package to increase the performance of conventional forming oils, excellent tool life with excellent surface qualities
BERUFORM KFP 22	n. m.	n. m.	Steel, stainless steel	+++++	+++++	Cold forming oil for most demanding forming processes with extremely high additive content, suitable for complicated work pieces or to be used as additive package to improve the performance of conventional forming oils
BERUFORM KFP 22 P	pasty	n. m.	Steel, stainless steel	+++++	+++++	Pasty concentrate of active ingredients, agent for most demanding forming processes in cold massive forming, also suitable as drawing paste in pre-drawing machines for the cold drawing of cold heading wires

* + = low ... +++++ = very high

Multifunctional oils for cold massive forming operations

From the view of the lubricant manufacturer there are two problems occurring in forming processes on modern multiple stage presses: Certain types of presses do not allow a separation between cold forming oil and machining oil due to their special construction. The use of conventional machine oils for cold massive forming will then lead to considerably increased tool wear based on the low level of high-pressure additives.

However, even if presses are used where the separation between machine, slideway and cold forming oil is possible, oil mixtures caused by leakages can never be totally excluded. This problem especially occurs with older machines. The additive level of the cold forming oil will drastically decrease due to dilution (mixing) whereas viscosity increases (increased drag-out losses). The performance loss will lead to premature oil change.

With the 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 (1000 hours and more) on four and five stage presses identical or even longer tool life could be achieved with BECHEM multifunctional oils than with conventional lubricants with an extremely high additive content. 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.

BECHEM multifunctional oils are thermostable, which means that there will be no cleaning problems caused by cracking residues.

With an extensive product range we are able to cover your total 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



Tomorrow's technologies. Today.

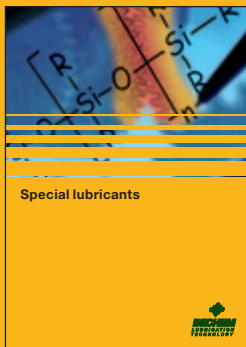
A tradition we are proud of since 1834. This is still today demonstrated by our trademark: the Rhus Flower. After permanent development, BECHEM is today a »Global Player«.

BECHEM special lubricants, industrial lubricants, metal working fluids and solutions for forming technology are based on our extensive experience in the development of special chemistry and on the latest tribologic knowledge. Our know-how with regard to friction, wear and lubrication always takes account of our customers' requirements for economical and ecological optimisation. We feel obliged to tradition and progress.

Besides the headquarter in Hagen, BECHEM has two other production sites in Germany – in Mieste and Kierspe. In addition to that, our worldwide distribution network allows us to develop markets all over the world. With daughter companies in France, India and Switzerland, as well as Joint Ventures in the USA, South Africa, Sweden and China, BECHEM shows its international presence.

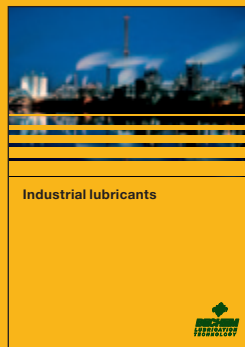
It is our target to supply our customers with high-quality products and to simultaneously meet the corresponding international standards. The quality of our products is guaranteed by our quality management system in accordance with the automotive standard ISO/TS 16949. All our production sites are systematically controlled by internal audits and regular external inspections by the certification association TÜV NORD CERT GmbH. Audits which are regularly carried out by our customers confirm the compliance with our high quality requirements.

Further information material is available either direct from us or at www.bechem.com



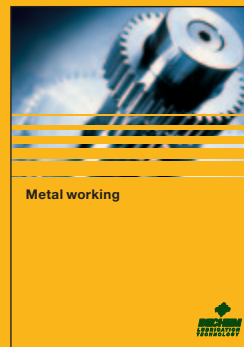
Special lubricants

- Low and high temperature lubricants
- Plastic lubrication
- Electrical contact lubricants
- Food grade lubricants
- Valve lubricants
- Anti-Friction-Coatings



Industrial lubricants

- High performance multipurpose greases
- Heavy duty and high temperature lubricants
- Hydraulic oils
- Gear lubricants
- »Green« lubricants



Metal working

- Coolant lubricants
- Cutting and grinding oils
- Deep drilling oils
- Corrosion protection oils
- Cleaning agents



Forming technology

- Wire drawing lubricants
- Cold forging oils
- Massive forming
- Tube drawing lubricants
- Sheet forming