



Advanced lubricants for  
metal working processes



**BECHEM**  
LUBRICATION  
TECHNOLOGY





# Importance of coolant

The role of coolant is critical in achieving higher efficiencies and productivity levels in metal working processes. The basic function of a coolant is to reduce friction between tool and work piece as well as to reduce and dissipate heat in the machining area. Knowledge of the dynamics involved in tool work interface, resultant frictional, tangential forces as well as behavior of the fluid when exposed to elevated temperatures and pressures are imperative in formulating the right coolant.

## Complete range for metal working processes

### ■ Metal working mediums
















- ✓ Coolants
- ✓ MQL
- ✓ Cutting oils
- ✓ Deep drilling oils
- ✓ Cleaning fluids

### ■ Metal forming fluids

- ✓ Cold forging oils
- ✓ Wire drawing lubricants
- ✓ Deep drawing oils
- ✓ Tube drawing

## PICTOGRAMS

### APPLICATIONS

- Drilling 
- Deep drilling 
- Milling 
- Grinding 
- Honing 
- Turning 
- Broaching 
- Deep drawing 
- Bending 
- Punching 
- Fine blanking 
- Cold forming 
- Automotive industry 
- Aviation industry 
- Tool manufacture 

### PROPERTIES

- Chlorine free 
- Good rinsing performance 
- Low foaming 
- Safe working environment 
- Extended tool life 
- Minimum quantity lubrication 
- Low residue level 
- Corrosion protection 
- High loads 
- Compatible with plastics 
- Manual cleaning 



# BECHEM Avantin













BECHEM Avantin range is the most advanced breed of cutting fluids that have set new benchmarks in the industry by achieving maximum performance with minimal consumption. Fortified with advanced additives the BECHEM Avantin range is equipped to contend harsh external impurities such as hydraulic oil, swarf and grinding dust whilst delivering unmatched performance.



>> BECHEM Avantin for minimal consumption and stain free machining <<

Product	Oil Content Approx.	pH Value at 5%	Corrosion Protection DIN 51380/2 Note 0 - 1	Refractometer Index	Properties
<b>BECHEM Avantin 405</b> 	0%	9.2	4%	2.1	Fully synthetic coolant with excellent EP properties. Suitable for grinding, cutting operations of cast iron, SG iron, steel and alloys. Synthetic character ensures high stability and long lifetime of the emulsion. Has transparent appearance. Free of Boron and Formaldehyde releasing agents
<b>BECHEM Avantin 320</b> 	15%	9.1 - 9.3	3.50%	1.65	Excellent dirt carrying capacity. Suitable for all types of grinding applications and cast iron machining. Has high emulsion stability. Not suitable for aluminium.
<b>BECHEM Avantin 331 H</b> 	30%	9.4 - 9.7	3%	1.25	Designed for machining of cast iron, SG iron and steel. Low tendency of discolouration in CI machining. Provides good lubrication and possesses excellent corrosion protection properties.
<b>BECHEM Avantin 255 AL</b> 	39%	8.8 - 9.0	5%	1	Amine and boron free coolant. Best suited for sensitive aluminium and non-ferrous metals. Also suitable for steel and stainless steel. High lubricity ensures excellent surface finish.
<b>BECHEM Avantin 361 H</b> 	45%	9.2 - 9.5	3.5%	1.01	Universal product for machining and grinding applications. Possesses good lubricity. Suitable for aluminium, sensitive alloys, steel, cast iron and SS machining. Suitable for high coolant pressure machines due to lower foaming tendency. Provides high bio-stability. Has excellent corrosion protection properties.
<b>BECHEM Avantin 359 H</b> 	50%	9.2 - 9.5	3.5%	1.02	Designed for demanding machining applications such as boring, reaming, threading and grooving. Provides excellent surface finish and improves tool life. Recommended for most aluminium alloys, stainless steel and other steel alloys. Increases tool life. Offers excellent lubricity. Provides excellent surface finish and good machining results. Contains chlorinated paraffins.

# Stay ahead with BECHEM's extensive range : MQL, neat oils and forming fluids

	Product	Viscosity [mm <sup>2</sup> /S] at 40 °C	Flash point [°C]	Materials to be processed	Properties
Neat oils	<b>Berugrind 7 HC</b> 	7 - 9	≥ 160	Carbides, Steel, Cast steel, Stainless steel, Titanium, HSS	Recommended for grinding of tungsten carbide tools, honing, engraving, mould construction, die manufacturing processes. Excellent cooling properties with low evaporation tendency. High dirt carrying capacity. Has good flushing properties. Minimal foam formation.
	<b>Berucut SCO 322 HC</b> 	21.5 - 25.5	≥ 185	Steel, Stainless steel, Non-ferrous metals	Recommended for turning, drilling, milling, grinding, deep drilling, thread cutting, gear cutting and severe grinding operations. Supports high speed cutting. No formation of built up edges. Has excellent EP/AW properties, excellent filterability as well as flushing properties.
	<b>Berucut SCO 316 HC</b> 	16	≥ 186	Steel, Stainless Steel, Non ferrous metals, Titanium	Non water miscible coolant for cutting, grinding, drilling, milling, turning, thread cutting, deep drilling, tooth / gear grinding operations. Possesses excellent anti-wear and EP properties. Extends tool life. Free of Chlorine and heavy metal containing additives. Supports high speed cutting. Reduces aerosol formation
	<b>Berucut RMO 244</b> 	20 - 24	≥ 150	Steel, Stainless steel	Recommended for vertical broaching, sawing, thread cutting, thread forming and massive forming operations. Low evaporation tendency. High load carrying and rinsing performance. Powerful AW/EP additives.
	<b>Berucut XC 1115</b> 	15	≥ 195	Steel, Titanium, Nickel alloys, Stainless Steel, Chrome Cobalt and Non-ferrous metals	High performance cutting fluid, developed on fully synthetic base with excellent anti wear properties . Developed for machining processes such as turning, milling, deep drilling, thread cutting and tooth grinding. Suited for machining components used in medical technology. Extends tool life. Provides excellent surface finish along with good corrosion protection. Minimises foam formation. Free of chlorine and heavy metals. Non cytotoxic acco to DIN EN ISO 10993-5:2009
	<b>BECHEM Cut XC 2205</b> 	4.8	> 134	Carbide metal, Steel, Stainless steel, Cast steel, HSS, Titanium	Recommended for Grinding, Honing, Engrave, Tool Manufacture, Mould Construction, Die Manufacture operations. Excellent cooling properties, high dirt carrying capacity, low evaporation tendency, very good flushing properties, low foam formation
EDM Oil	<b>BECHEM Dielectricum 4027</b> 	2.5	≥ 101	Steel, Stainless Steel, Aluminium, Copper and non-ferrous metals	Universal EDM oil for finishing and roughing processes. Ensures low electrode wear. Excellent rinsing and cooling properties. High resistance to ageing. Low evaporation. Very low aromatic content, hence odourless.
Forming, punching & blanking	<b>Berudraw 4046</b> 	277 - 337	≥ 186	Steel, Stainless steel	Non water miscible oil for drawing of round bars and profiles (square, hexagon) with difficult geometries. Recommended for deep drawing as well as demanding sheet forming and cold forming operations.
	<b>Beruform KFP 96</b> 	81.5 - 100.5	≥ 170	Steel, Stainless steel	Non water miscible cold forming oil for demanding and multiple forming operations. Suitable for cold extrusion, piercing, punching and deep drawing operations. Provides longer coolant service life. Free of chlorine and heavy duty metals.
	<b>Beruform STO 110</b> 	41.4 - 50.6	≥ 290	Steel, Stainless steel, Aluminium, Copper	Recommended for punching, bending and stamping operations. High-performance, fully synthetic forming oil for minimum quantity lubrication with higher flash point. Can be applied by spray equipment, drip oiler, roller or brush.
	<b>Beruform STO 5</b> 	4.7	≥ 160	Steel, Stainless steel, Aluminium, Copper	Non water miscible oil for easy to medium machining operations such as punching, cutting and bending. Free of chlorine and heavy metals. Provides excellent surface finish. Can be applied by spray equipment, drip oiler, roller or brush.
	<b>Beruform VSM 9</b> 	1.3	≥ 65	Steel, Aluminium, Copper and alloys	Biodegradable punching and bending oil. Recommended for operations of fine sheets upto 1mm approx. Also for forming of electrical contacts. Good evaporation.
	<b>Beruform MF 155 I</b> 	99-121	≥ 190	Steel, Stainless Steel, Aluminium, Copper and Brass	Non water miscible <b>multifunctional</b> oil for cold massive forming on multiple stage presses. Suitable for cold extrusion, piercing, punching, blanking and drawing etc. Cold drawing of bare steel in wet drawing processes, forming degrees between 20% and 30% can be achieved. Drawing of round bars and profiles (square, hexagon) with difficult geometries.
	<b>Beruform MF 148-68 I</b> 	61-75	≥ 180	Steel, Aluminium, Copper and Brass	High performance multifunctional oil for demanding forming processes such as multi stage presses in cold forming processes. Suitable for cold extrusion, piercing, punching, blanking and drawing etc. Extends tool life. Provides excellent forming performance. Provides good corrosion protection.
	<b>Beruform MF 155 C</b> 	88-108	≥ 190	Steel, Stainless Steel, Aluminium, Copper, Brass	Non water miscible forming oil recommended for cold extrusion, sheet forming, piercing, punching, blanking and drawing operations. Suitable for cold drawing of bare steel in wet drawing processes, forming degrees between 20% and 30% can be achieved. Also suitable for drawing of round bars and profiles (square, hexagon) with difficult geometries. Contains chlorinated paraffins.



# Stay ahead with BECHEM's extensive range : MQL, neat oils and forming fluids

Product	Viscosity [mm <sup>2</sup> /S] at 40 °C	Flash point [°C]	Materials to be processed	Properties
<b>Berucut MQL-A 20</b> 	24.3 - 29.7	≥ 180	Steel, Stainless steel, Aluminium, Copper	Recommended for MQL machining and forming operations including punching, bending and stamping. Specially suited for machining of aluminium alloys sensitive to staining. Application possible with very low dosages, possesses excellent rinsing capacity. Fast evaporation.
<b>Berucut MQL-A 16</b> 	16 - 24	≥ 150	Steel, Stainless steel, Aluminium, Copper	Recommended for MQL machining and forming operations including punching, bending and stamping. Specially suited for machining of aluminium alloys sensitive to staining. Application possible with very low dosages, possesses excellent rinsing capacity. Faster evaporation compared to MQL-A-20.
<b>Beruform STO 110</b> 	41.4 - 50.6	≥ 290	Steel, Stainless steel, Aluminium, Copper	High-performance, fully synthetic oil for minimum quantity lubrication with higher flash point. Suitable for machining and forming applications including punching, bending and stamping.
<b>Beruform STO 5</b> 	4.7	≥ 160	Steel, Stainless steel, Aluminium, Copper	Non water miscible punching, cutting and bending oil suitable for minimum quantity lubrication. Suitable for medium machining operations.
<b>Berucut MQL M 30</b> 	27-33	≥ 180	Low alloy steels, aluminium, ferrous and non ferrous metals	Non water miscible fluid for minimum quantity lubrication applications involving cutting and non cutting operations. Also suitable for forming operations such as punching and bending. Possesses excellent EP properties, extends tool life. Free from chlorine and heavy metals.

## Cleaners for higher productivity

Cleaning of work-piece and semi finished products for subsequent process is an important aspect during production. Insufficient or incorrect cleaning often lead to defective products and increase in rejection rates.

### Beruclean : Heavy duty range of cleaners by BECHEM

Based on, advanced formulation Beruclean range of cleaners provide spotless and speck free components, leaving no residues mandatory for critical machining processes. The Beruclean range is available in both aqueous and solvent-based biodegradable variations for wide variety of materials.

» Beruclean, cuts through rigid dirt, grime, grease and sludge «

### Cleaners based on synthetic hydrocarbons

Product	Viscosity at 20°C [mm <sup>2</sup> /S]	Flash Point [°C]	Properties
<b>Beruclean Eco</b> 	1.8	≥ 65	No ozone depleting agents. Compatible with plastics and rubber. Universal cold cleaning agent, free of aromatic hydrocarbons, almost no smell, readily biodegradable according to OECD 301 F. Also NSF-H1 approved. Gives temporary rust protection.
<b>Beruclean 4027</b> 	3.3	≥ 101	Cold cleaner based on paraffin hydrocarbons with low aromatic content and free from hazardous substances. Leaves a thin oily corrosion protection film. No ozone depleting agents. Higher flash point. Compatible with plastics and rubber.





### Concentrates for aqueous cleaning

Product	pH Value at 5%	Examples of application	Properties
<b>Beruclean 113 EMF</b> 	9.5	Suitable for Steel, SS, Aluminium and Cast iron	Universal alkaline cleaner with low foaming properties. Specially recommended for high pressure cleaning applications: Spray cleaning (+55°C to +70°C), Ultrasonic cleaning (+50°C to +70°C) and Immersion cleaning (+50°C to +80°C).
<b>Beruclean 111 EHF</b> 	13	Steel, SS and Cast iron	High alkaline aqueous cleaning agent for steel and ferrous materials. Specially recommended for ultrasonic applications. Effective against extremely rigid dust and sludge particles. Spray cleaning (+ 40°C to +60°C), Ultrasonic cleaning (+50°C to +80°C) and Immersion cleaning (+50°C to +80°C).
<b>Beruclean 3050</b> 	10.2	Suitable for Concrete, Ferrous, Glass, Plastic surfaces, Steel, Tiles	Universal, alkaline cleaner to remove industrial contamination. Suitable for manual cleaning, and scrubber vacuum machines. Neutral towards paints, rubber seals, plastics, textile and aluminium. Suited for machine and floor cleaning.
<b>Beruclean 3849</b> 	1.5	Ceramic, Copper, Glass, Plastic or other acid-resistant materials, Stainless Steel	Acidic cleaner with surfactants for removal of organic and inorganic residues. Designed for immersion and manual cleaning as well as for diluted use in high pressure cleaners. Removes stubborn lime deposits. Cleans acid-resistant materials and rust.

# Experience the Avantin edge


- **Long sump life**
  - ✓ Excellent bio stability
  - ✓ Superior flushing properties
  - ✓ Cleaner work environment
- **Excellent corrosion protection**
  - ✓ **Minimal top-up quantity**
  - ✓ Negligible drag out losses
- **Good machining performance**
  - ✓ Excellent surface finish
  - ✓ Enhanced tool life

## » BECHEM Avantin service chart «


Parameter	Properties
<b>Water</b> 	Recommended water <ul style="list-style-type: none"> <li>• pH value 7</li> <li>• Hardness: Up to 50 ppm</li> <li>• Chloride content &lt;25 ppm</li> <li>• Ensure water devoid of bacteria or fungal attack</li> </ul>
<b>Initial Filling</b> 	Procedure <ul style="list-style-type: none"> <li>• Use BECHEM System cleaner</li> <li>- Add system cleaner at 1% of cutting fluid in the tank</li> <li>• Drain the entire system after circulating the cutting fluid for 12 to 24 hours</li> <li>• Refill and circulate fresh water throughout the system. Flush out water so that all traces of cleaner and swarf are removed</li> <li>• For better results flush with 1% emulsion</li> <li>• Charge the tank with fresh emulsion</li> </ul>
<b>Mixing</b> 	<ul style="list-style-type: none"> <li>• Add oil to water slowly with constant stirring. Do not add water to oil</li> <li>• Mixing unit is recommended for better results</li> <li>• Avoid compressed air and coolant pumps</li> </ul>
<b>Maintenance</b> 	<ul style="list-style-type: none"> <li>• Keep the required concentration stable</li> <li>• Measure pH regularly</li> <li>• Check the appearance of coolant for colour, odour, foam, cleanliness of the system etc.</li> <li>• Avoid all sorts of dust</li> <li>• Remove any tramp oil from the coolant tank</li> </ul>

## Awarded – BECHEM lubricants


High quality lubricants are indispensable products which are worth their investment, they are winners of prestigious awards – by making a decisive contribution to performance, energy efficiency and sustainability of products and processes.




Awarded for Berufluid – a mutual project with the Fraunhofer-Institut for Process and Technology and the Braunschweig Institute for Machine Tools and Production Technology.



BECHEM was awarded a prize for tailor-made solutions for vehicles in the premium segment.



As an award winner, BECHEM now belongs to the 20 most innovative companies in North Rhine-Westphalia, Germany.



BECHEM received an award for innovative lifetime lubrication of various vehicle components.

# Lubrication Solutions for Industry



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