

# ECOCOOL / ECOCUT / RATAK / RENOFORM

## Metal Working Fluids



LUBRICANTS.  
TECHNOLOGY.  
PEOPLE.



# LUBRICANTS. TECHNOLOGY. PEOPLE.

We focus consistently on high-quality lubricants and related specialties.

We develop innovative and holistic solutions for a wide variety of applications.

We value the high level of commitment of our employees and their trusting interaction with one another.



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### Facts and figures

**Company:** FUCHS PETROLUB SE, founded in 1931

**Headquarters:** Mannheim

**Product range:** A full range of over 10,000 lubricants and related specialties

**Industries:** Metalworking, agriculture, forestry, aerospace, power generation, mechanical engineering, construction, transport, steel, metal, bearing, cement industry, automotive industry, OEM, mining, exploration, food industry, glass production sector, casting and forging industry, etc.

**No. of employees:** Over 5,000 worldwide

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FUCHS LUBRICANTS (INDIA) PVT. LTD. is a wholly owned subsidiary of FUCHS PETROLUB SE, the world's largest independent lubricants manufacturer. Founded in 1931 by RUDOLF FUCHS, the group is manufacturing a comprehensive range of lubricants and derived specialties for a wide range of applications.

Our company's degree of specialization and innovation is way above the industrial average in this field. The full product line includes almost thousands of lubricants and derived specialties for all walks of life, industrial processes and applications. Our customers' success is also our success. Because partnership to us means passing on benefits.

And naturally, partnership for us also means providing our customers with competent support. With comprehensive marketing. With high performance logistics. With development of successful service concepts. And qualified consulting. Because together, we can achieve more.

FUCHS lubricants stand for performance and sustainability, for safety and reliability, for efficiency and cost savings. They represent a promise – Technology that pays off.

## WATER-MISCIBLE CUTTING FLUIDS FOR METALWORKING OPERATIONS

In manufacturing today, the demands made on cutting fluids have increased enormously. As part of the Industry 4.0 concept, the entire added-value chain of people, machines, logistics and cutting fluids should be interlinked and optimized to achieve largely self-organizing production with the help of advanced IT and communications technologies. For this, cutting fluid measurement data must be accessible online, evaluated and corresponding adjustments made. For measured data to be accurately analyzed, high stability cutting fluids are essential.

## Innovative Materials

In today's world of automotive manufacturing, cast iron is being increasingly replaced by lighter aluminium alloys and tungsten-coated tools offer greater economies in highly-developed machining processes. Products in the 21st century demand very close manufacturing tolerances and the shortest possible manufacturing times.

## Advanced Products

FUCHS – the global leader in the field of specialty lubricants – offers innovative cutting fluids for sophisticated processes in automotive industries such as the machining of crankcases, crankshaft grinding or the honing of critical bearing surfaces.

## Safe, economical and sustainable in use

FUCHS is the specialist for metalworking operations. Our water-miscible cutting fluids are safe and reliable and fulfil all legislative requirements so that their use can be judged to be almost risk-free. The sustainability of our ECOCOOL products was factored into their formulation. FUCHS cutting fluids thus offer long service life.

FUCHS cutting fluids are:

- Free of nitrosamine-forming secondary amines
- Free of hard complexing agents
- Skin compatible
- Sustainable
- Economical
- Reach compliant

This means more than just workshop safety for ECOCOOL users. ECOCOOL lubricants are also extraordinarily long-life and economical. This lowers operating, maintenance and disposal costs. In addition, the carefully selected ingredients increase skin compatibility even at high pH values.

## Optimum technical properties

FUCHS cutting fluids fulfil the technical requirements and make machining operations more efficient. ECOCOOL products guarantee:

- Optimum cooling and flushing
- Outstanding lubricity
- Excellent wear protection
- Effective corrosion protection
- Low foaming
- Good results with innovative materials
- Excellent EP properties

For the ECOCOOL user, this means more process reliability, more effective and efficient staging and less expensive machine down time.

## Available throughout the world

Our customers are located throughout the world and our cutting fluids are available where they are. This means that all raw materials must be registered and comply with chemical regulations in the respective countries. FUCHS offers water-miscible cutting fluids under the name ECOCOOL GLOBAL which can be manufactured anywhere in the world with the same formulation. This allows users to pursue globally-harmonized manufacturing processes with the same fluids.

## FUCHS Industrial Lubricants

# Practical Application Recommendations.

Water miscible	Type	pH @5% DW	Application (Operations & Materials)
ECOCOOL 700 NBF M	Semi synthetic	9.2	Machining of steel, cast iron, stainless steel, inconel, titanium, die steel and other hard material to machine. Stable in hard water upto 800 ppm, offering long sump life with less oil consumption.
ECOCOOL 705 I	Semi synthetic	8.9	Machining and grinding of sensitive grade of aluminium primarily. It can be used for brass and copper.
ECOCOOL 600 NBF C	Semi synthetic	9.1	Machining and grinding of ferrous materials. Stable in hard water upto 800 ppm.
ECOCOOL 650 NBF I	Semi synthetic	9.3	Special product for centreless grinding and bearing grinding
ECOCOOL 68 CF2 L	Semi synthetic	9.2	Machining of steel and cast iron. Stable in hard water upto 600 ppm
ECOCOOL 4810	Semi synthetic	8.8	Machining of aluminium. Specially developed for piston machining.
ECOCOOL SSUP	Synthetic	9.4	Special product for cylindrical grinding. Specially developed for steel plant for roll grinding.
Neat oils	Flash Point °C	Kin. Viscosity Cst @40° C	Application (Operations & Materials)
ECOCUT HFN 5 I	> 135	5-7	Special Product for bearing and cylinder block honing.
ECOCUT HFN 5LE	> 135	5-7	Low misting, low evaporating chlorine free oil, especially suitable for honing and carbide grinding.
RATAK HFN 15B	> 135	5-7	Recommended for honing and grinding, especially suitable for carbide grinding.
ECOCUT HFN 10LE	> 150	9-11	Low misting, low evaporating oil, especially suitable for grinding of ferrous and non-ferrous materials. Series includes higher viscosities for hydraulic systems and for normal to difficult machining operations.
ECOCUT HFN 16LE	> 200	16	Special product for swiss lathe slide head machine for ferrous and non-ferrous material.
RATAK MSN 321	> 170	21	High performance oil developed for spline broaching.
RATAK MN 201	> 160	19-22	General machining of ferrous and non-ferrous materials.
ECOCUT 628 B	> 160	27-30	Suitable for hobbing, threading and broaching application. Contains Sulphur.
ECOCUT 732 I	> 195	32	High performance neat cutting oil specially developed for gear hobbing, gear shaving, gear shaping and thread rolling.

## The complete Forming Lubricants programme from the Specialists



The manufacturing of cold formed parts involves a large number of complex steps. These steps are independent on each other and carefully matched. And in particular, the lubricants used have to guarantee optimum compatibility throughout the process. Cross-compatibility is constantly monitored in our own, state-of-the-art research facilities and laboratories. This guarantees a reliable process chain starting with cleaning, to metalworking, through to corrosion protection.

As well as constant monitoring, we regularly add new products to our program. Apart from conventional products and solutions, we also offer products which conform to environmental regulations. Decades of experience, far-reaching know-how, global approvals from leading manufacturers and our local experts make our product program unique for safety and reliability, for efficiency and cost savings. They represent a promise – Technology that pays off.

### **The benefits of FUCHS system products:**

- Intensive consultation, optimum service – worldwide
- Full range of products – all from one supplier
- Fully compatible products
- No process failures caused by product incompatibility
- Thorough testing in in-house facilities
- Close cooperation in obtaining approvals

### **Innovation to provide process reliability**

FUCHS lubricants understand the challenges in today's metal forming applications. Light weighting of components, diverse substrates, productivity, regulatory challenges, and increasing part complexities will all continue to create substantial changes to the industry and require more robust lubricants to meet your process requirements. FUCHS has developed a comprehensive portfolio of metal forming lubricants to advance your operation now and into the future.

## FUCHS Industrial Lubricants

# Practical Application Recommendations.

Product	Viscosity	Application (Operations & Materials)
<b>Forming and Drawing</b>		
<b>RENOFORM HBT 581/3</b>		Drawing paste with solid lubricants suitable for highest deformation ratio. Suitable for steel, GI, aluminium.
<b>TUFDRAW 1730 R</b>	22cst @ 100°C	Heavy duty water dilutable drawing and stamping fluid for steel, stainless steel, aluminum and nickel alloys.
<b>Blanking / Stamping / Cold Forging</b>		
<b>RENOFORM SSI 28 M</b>	2.3 cst	Evaporative oil for stamping of precision ferrous and non-ferrous components.
<b>RENOFORM SV 6483 X</b>	2.0 cst	Evaporative oil for stamping of silicon steel laminations.
<b>RENOFORM MZAN 51</b>	100 cst	High performance fine blanking oil. Suitable for tough chrome, nickel and vanadium alloys.
<b>RENOFORM 319 FM</b>	195 cst	Extreme pressure cold forging lubricants for cold heads and cold part formers. Excellent results in extrusion.
<b>RENOFORM 319 I</b>	85 cst	Extreme pressure cold forging lubricants for cold heads and cold part formers. Excellent results in extrusion.
<b>RATAK MSN 322</b>	45 cst	Extreme pressure cold forging of nut and cold forging of rivets, lubricants for cold heads and cold part formers.
<b>RENOFORM 51 NF</b>	350 cst	Extreme pressure lubricants for pilgering, deep drawing, blanking and cold heads and extrusion. Suitable for tough chrome, nickel and vanadium alloys.
<b>Wire / Tube Drawing</b>		
<b>RENOFORM FW 9</b>	90 cst	High performance aluminium wire drawing for RBD (rod brake down) application.
<b>RENOFORM FW 2</b>	20 cst	High performance aluminium wire drawing for fine wire drawing application.
<b>RENOFORM MCU 20</b>	8.8 pH	High performance copper wire drawing for RBD (rod brake down) Application 8 to 10 % in soft water.
<b>MASTERSOL C21 PLUS</b>	8.5 pH	Copper wire drawing for fine wire drawing application 3 to 5% in soft water.
<b>RENOFORM MF 10 M</b>	8.8 pH	Carbon steel wire drawing for fine wire drawing application 8 to 10% in soft water.
<b>RENOFORM 640 /33</b>	600 cst	Tube drawing lubricant for copper and aluminium.



## Special Product Solutions: Minimum Quantity Lubrication (MQL) Products



Source: Bielomatik Leuze GmbH + Co. KG

FUCHS PLANTO MIKRO and ECOCUT MIKRO PLUS are product series which were specially developed for MQL. And practical trials have shown that the optimization of the cutting fluid is what makes Minimum Quantity Lubrication technology economically worthwhile for certain machining operations.

### Special ester oils and fatty alcohols

Lubricants based on special ester oils and fatty alcohols have been shown to be especially suitable for Minimum Quantity Lubrication applications.

### PLANTO MIKRO – Ester oil based MQL

- Have a higher boiling and flashpoint even at lower viscosities
- Create significantly less vapour
- Form a thin film on components but nevertheless feel dry

### ECOCUT MIKRO PLUS – Fatty alcohol based MQL

- Have a lower flashpoint than ester oils of the same viscosity
- Evaporate relatively easily so that components dry quickly
- Generate moderate cooling.

**Over 25 years**

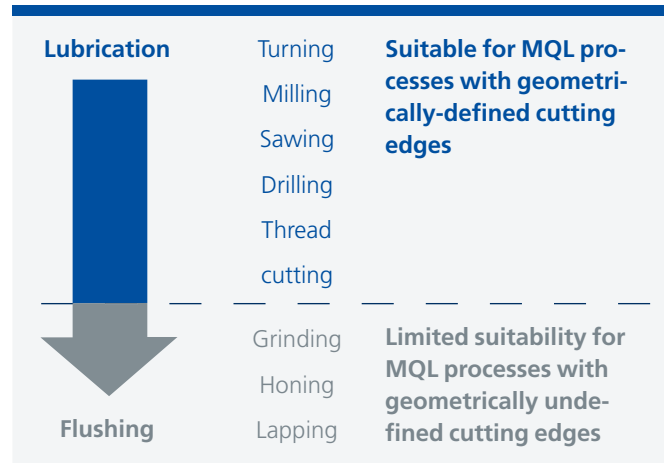
experience in the application of  
Minimum Quantity Lubrication

**PLANTO MIKRO and ECOCUT MIKRO PLUS lubricants are “low-emission” according to the German publication BGI 718 “Minimum Quantity Lubrication for Chip-Forming Machining Operations”.**

PLANTO MIKRO and ECOCUT MIKRO PLUS products are approved by leading Minimum Quantity Lubrication equipment manufacturers and are noteworthy for the following properties:

- Good sprayability
- Optimum droplet characteristics
- Good lubrication
- Low odour
- Tried and tested

**Minimum Quantity Lubrication for a variety of machining operations**



**PLANTO MIKRO and ECOCUT MIKRO PLUS products are suitable for use with single-channel (AEROSOL BUSTER) and/or two-channel spray systems.**

Product	Spray system		Steel	Cast iron	Aluminium	Cu
	1 channel	2 channel				
ECOCUT MIKRO PLUS 20	x	x	● ● ●	● ● ●	● ● ●	● ● ●
PLANTO MIKRO UNI	x	x	● ● ●	● ●	● ● ●	● ●
PLANTO MIKRO 830 5-CS	–	x	● ● ●	● ●	●	–

● ● ● Perfectly suitable   ● ● Suitable   ● Limited suitability   – Not suitable

Extract from our Product Program. Further products on request.

# Complete Solutions for all your Manufacturing Processes

With system solutions from FUCHS, the world's largest independent manufacturer of lubricants with the most extensive program of metalworking fluids, you have chosen an absolute specialist. And thus benefit from all the know-how, years of application engineering experience and customized solutions.

**Example:** Manufacturing gearboxes.



## MACHINING: WM\* ECOCOOL

- High performance
- Economical
- Outstanding lubricity



## MACHINING: NEAT ECOCUT

- Increased reliability
- Economical
- Low misting and low evaporation



## QUENCHING THERMISOL

- Low distortion
- Low consumption
- Good compatibility



## CLEANING RENOCLEAN

- Highly effective
- Unproblematic processes
- Outstanding emulsification and demulsification



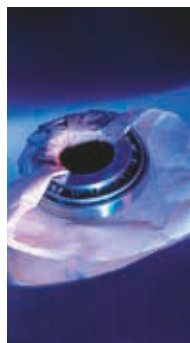
## LUBRICATION: GREASES RENOLIT

- Compatible
- Long-term and life-long lubrication
- Optimum compatibility with



## LUBRICATION: OILS RENOLIN

- Compatible
- Excellent corrosion protection
- Optimum wear protection



## PROTECTION ANTICORIT

- Outstanding solution for corrosion protection
- Optimally compatible
- Easy removability
- Economic efficiency



## FORMING RENOFORM

- Compatible
- Adhesive-compatible
- Easily welded



## FLUID MANAGEMENT CPM

- For all fluids
- Auditable documentation
- Better performance
- High process reliability
- Cost reductions

FUCHS Industrial lubricants

## Innovative lubricants need experienced application engineers

Every lubricant change should be preceded by expert consultation on the application in question. Only then can the best lubricant system be selected. Experienced FUCHS engineers will be glad to advise on products for the application in question and also on our full range of lubricants.

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