

FUCHS Industrial Lubricants

For extra process reliability

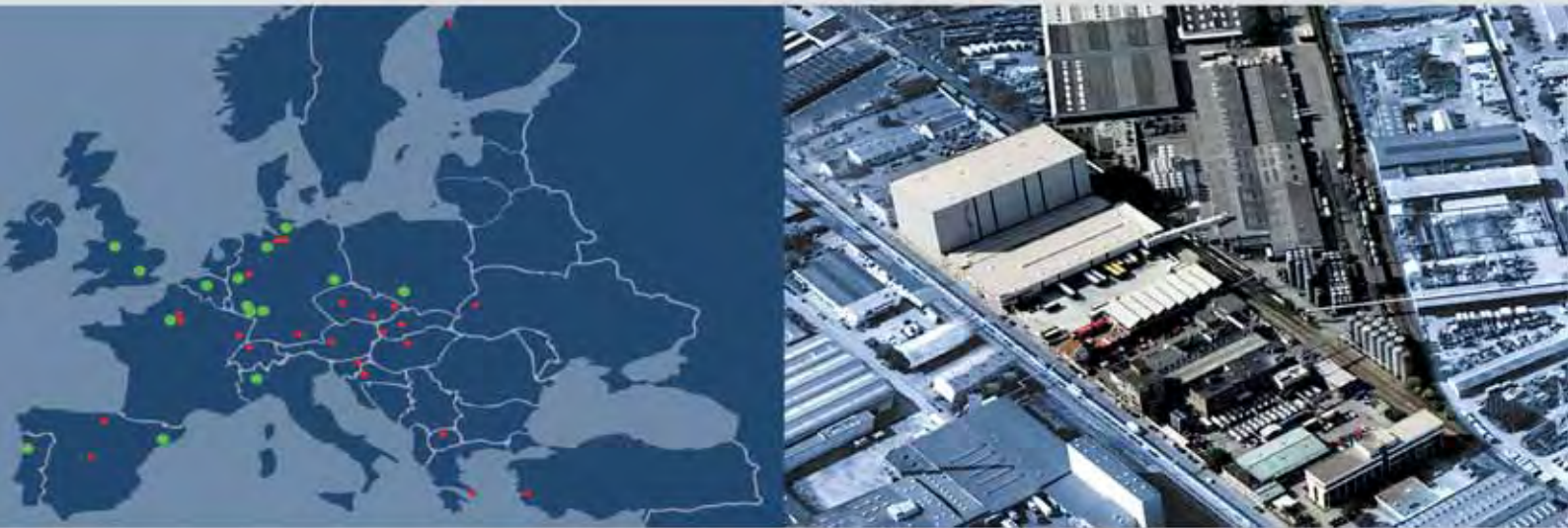


Lubricants for cold forming



FUCHS EUROPE SCHMIERSTOFFE GMBH

YOUR STRONG GLOBAL PARTNER



HOW WE EXCEL

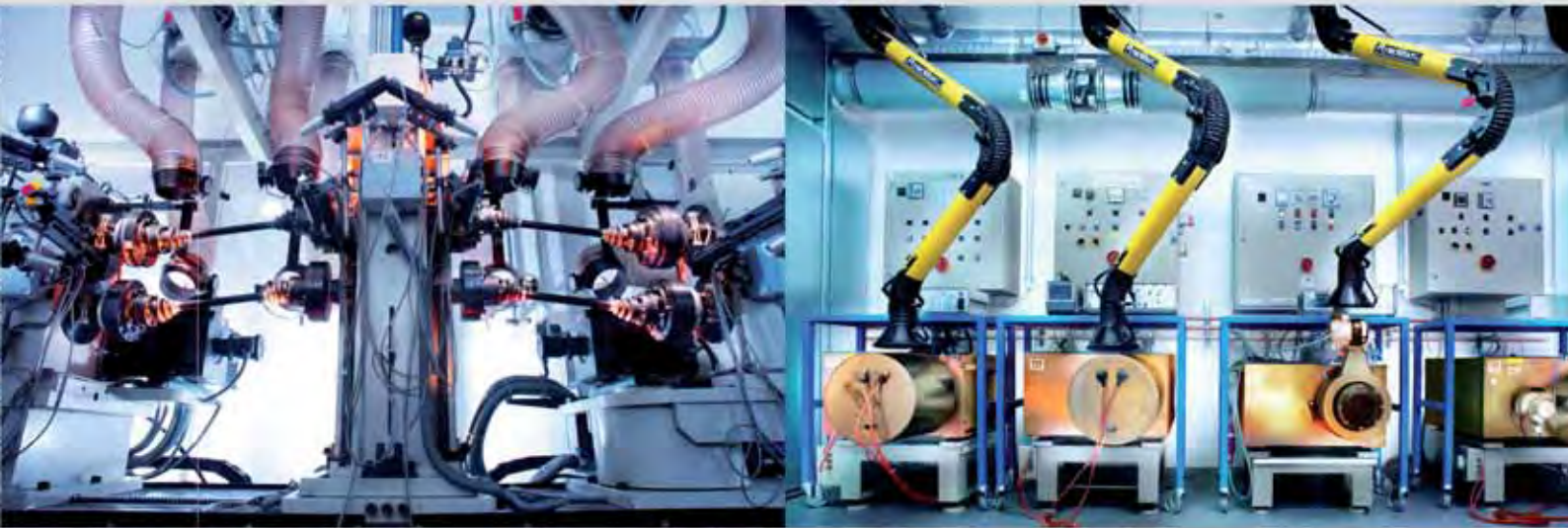
We are a German company whose almost 600 employees manufacture and market a wide range of lubricants and derived specialties. The company, which was founded in 1931 as RUDOLF FUCHS, is located in Mannheim and is a 100 % subsidiary of FUCHS PETROLUB AG, which is the largest independent lubricants manufacturer worldwide.

Our company's degree of specialisation and innovation is way above the industrial average in this field. The full product line includes almost 2,000 lubricants and derived specialties for all walks of life, industrial processes and applications. Our customer's success is also our success. Because partnership to us means passing-on benefits.

The advantage of a strong market presence: FUCHS is the largest independent manufacturer of lubricants in the world. The benefit of premium, innovative products from a full-line manufacturer: With a complete product line as well as tailor-made special solutions, FUCHS has a product for every application. The benefits of reliability: Certified according to DIN EN ISO 9001:2000 and ISO/TS 16949:2002, FUCHS has been continuously upgrading its highly specialised lubricants for decades.

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

FOR INDUSTRIAL LUBRICANTS



WHAT INCREASES THE VALUE OF OUR PRODUCTS

We develop lubricants: application-specific and tailor-made for our customer's processes. Together we look for the best lubricants for our customers. This cooperation is unique in terms of its form, scope and intensity. We call it **development partnership**. The success of our development partnerships is based on an important fact: FUCHS is not one of the oil-giants.

FUCHS is a multinational, independent lubricant manufacturer. Our independence is the difference. We are open to new solutions, open for visions – the prerequisites for innovations. And innovation is the defining characteristic of FUCHS. 70 % of our products are less than five years old and the great majority of our products are individual solutions. Challenge us and see!

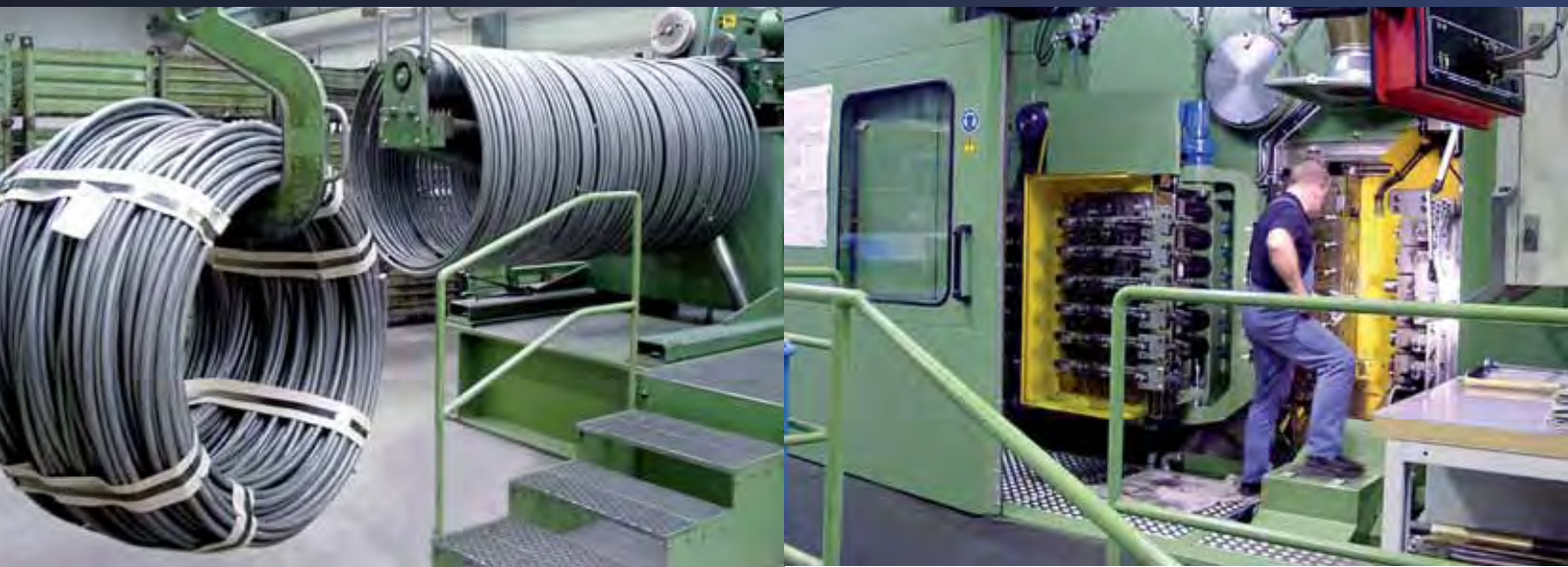


DIN EN ISO 9001:2000
ISO/TS 16949:2002
DIN EN ISO 14001:2004
REG.NR. 2476



Lubricants for cold forming.

Cold extrusion



The formation of an effective barrier film between the material and tool requires intelligent, high-performance lubricants to avoid

Cold extrusion oils

| Synthetic | | Mineral oil-based | |
|-----------------------------|---|-----------------------------|--|
| RENOFORM 319 NAT | Premium, mineral oil-free cold extrusion oil with polar and anti-wear additives for the manufacture of screws and studs. Also suitable for the machining of steel, aluminium and stainless steel. Approved by National Machinery. | RENOFORM MBO 68 | Mineral oil-based cold extrusion oil for simple-to average-difficulty operations on all materials. |
| PLANTOFORM UBO 950/2 | Synthetic forming oil for the extrusion of small, copper-based alloy and aluminium components. | RENOFORM HBO 1163/1 | Mineral oil-based, high-performance cold extrusion oil for steel, aluminium and stainless steel. |
| PLANTOFORM UBO 2797 | Synthetic forming oil for the die forging of copper-based alloy and aluminium components. | RENOFORM MBO 369/2 | High-performance cold extrusion oil for the most difficult operations. Also suitable as an oil for thread rolling. For steel, aluminium and stainless steel. |
| | | RENOFORM MZAN SERIES | High performance cold extrusion oils especially formulated for stainless steel (contains chlorine). |

While the information and figures given here are typical of current production and confirm to specification, minor variations may occur. Subject to amendment. Edition 07/2008





premature tool wear and seizures.

Multifunctional fluid

RENOFORM MBO 369 UNI

Mineral oil-based cold extrusion and slideway oil as a multifunctional product for the most difficult operations. Compatible with all common materials including non-ferrous metals.

Additive concentrate

RENOFORM PLUS 369

Additive concentrate for the most difficult operations. Can be used as a forming oil as well as an extra-performance additive for cold extrusion oils.

RENOFORM MBO 3191

Pasty, high-performance lubricant for particularly difficult extrusion operations. Can be used undiluted or together with other, compatible, extrusion oils.

We offer a large number of drawing lubricants ranging from low to high viscosity and containing various additive packages. The selection of the most suitable drawing lubricant depends on the type and difficulty of the application along with lubricant application method.

The optimum lubricant for every process stage.

Cleaning



Surfaces for subsequent manufacturing processes may have to be oil-free and clean. A number of different types of cleaners are available.

Solvent cleaners

| | |
|---------------|---|
| RENOCLEAN UWF | Solvent cleaner. Free of aromatics. Contains VOC*. |
| RENOCLEAN KU | Odor-optimised, solvent cleaner. Free of aromatics. Contains VOC*. |
| RENOCLEAN KLV | VOC*-free, universal solvent-based cleaner. Perfect for industrial, workshop and domestic applications. |

Water-based alkaline (sprayable) cleaners

| | |
|--------------------------|---|
| RENOCLEAN VR 1021 SERIES | Medium-alkalinity. For use at temperatures between +35 °C and +60 °C. |
|--------------------------|---|

Water-based alkaline (submersion) cleaners

| | |
|------------------------|--|
| RENOCLEAN SPEZIAL 2000 | Medium-alkalinity. Universal application such as components, floors, etc. |
| RENOCLEAN VR 1798/2 | Medium-alkalinity. Universally suitable for steel and aluminium. Also for ultrasonic cleaners. |

*VOC = Volatile Organic Compounds.

Corrosion protection



Corrosion protection is generally specified for storage and transport.

Dewatering fluids

| | |
|---------------------|--|
| ANTICORIT DF SERIES | High-speed dewatering fluids. Form thin, highly-effective, oily-, waxy- or lacquer-like films. Also available in versions without film-forming agents exclusively for stain-free drying. |
|---------------------|--|

Corrosion protection

| | |
|----------------------|---|
| ANTICORIT OHK SERIES | Corrosion protection concentrates and ready-to-use versions with white spirit, isoparaffins and oils to protect all metals. Outstanding fingerprint-remover properties. |
|----------------------|---|

Vapour phase inhibitors

| | |
|----------------------|--|
| ANTICORIT VCI SERIES | Advanced VCI technology for the protection of all metals. Available as VCI paper, film, powder, tablets or oils. Tailor-made solutions for corrosion protection and packaging. |
|----------------------|--|

A wide range of films are available ranging from oily to vaseline-like and wax-like. If a film is not required, we can solve your corrosion protection problems with our comprehensive VCI line of products. This includes paper, films, tablets, foams and many other special solutions.

The complete lubricants program from the specialists.

All from one supplier

The manufacturing of cold formed parts involves a large number of complex steps. These steps are inter-dependent on each other and carefully matched. And, in particular, the lubricants used have to guarantee optimum compatibility throughout the process. This leaflet provides an overview of the full line of products offered FUCHS.

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 national environmental legislation and/or VOC regulations.

Decades of experience, far-reaching know-how, global approvals from leading manufacturers and our local experts make our product program unique.

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

For optimum process reliability.



Ask the specialists:

The FUCHS check list for a product recommendation.

Based on this questionnaire, we can tell you which is the best lubricant for your particular needs.

Your address

Company/customer: _____

Phone: _____

Street: _____

Fax: _____

City: _____

E-mail: _____

Contact/function/dept.: _____

Which product do you currently use?

Forming lubricant: _____

Cleaner: _____

Corrosion protection: _____

Forming

Material (blank): Steel Stainless steel Aluminium Nonferrous metal

Other: _____

Material thickness: $s_0 =$ _____ mm

Tool: Material: _____ Coating: _____

Machine: Manufacturer: _____ Type: _____

Specification of the desired forming lubricant:

Mineral oil-based Chlorine-free Corrosion protection
 Synthetic Pigments

Viscosity at +40 °C: $\nu_{40} =$ _____ mm²/s Concentration: _____ %

Application:

Spraying on the material Run-off
 Spraying the tool Flooding

Other: _____

**Simply copy, complete – as far as possible –
and fax back to +49 621 3701-414.**

Cleaning

Process: Dipping Spraying Flooding Other: _____

Type: Water-based Acidic Alkaline Neutral Other: _____

Washing: Wash temperature: _____ °C pH-value: _____ Duration: _____ s, min, hr

Storage: Type of storage: _____ Duration: _____ Days, Weeks

Subsequent processes: _____

Corrosion protection

Packing: None In µm PE film Individual packaging Closed packaging
 In greaseproof paper In µm VCI film In racks Open packaging
 With VCI On greaseproof paper Other: _____

Transport: No transport National Sea freight on deck Sea freight below deck
 Regional Within Europe

Storage condition: Warehouse Tropical climate Cold climate Temperature: _____ °C
 Shed Subtropical climate Monsoon conditions Humidity: _____ %
 Outdoors Temperate climate Coastal region Other: _____

Required corrosion protection duration: Up to 1 week Up to 3 month Up to 1 year Up to 3 year
 Up to 1 month Up to 6 month Up to 1 1/2 year Over 5 year

Film type: No film Waxy < 2 µm > 5 µm
 Oily Vaseline-like 2 – 5 µm _____

Characteristics of the corrosion preventive: Non-thixotropic With VCI inhibitors Solvent FP < +61 °C Water-based
 Thixotropic VOC-free solvent Solvent FP > +61 °C Barium-free

Application: Dipping Hot application Temperature: _____ °C
 Spraying Drying possible Other: _____

Supplementary comments:

Signature: _____

Date: _____

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.



Contact:



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