

The **FUCHS** Group

All your needs covered.
Your lubricants and solutions
for all applications.







GLOBAL COMPANY, GERMAN ROOTS.

The FUCHS Group is the largest independent manufacturer of lubricants in the world. Founded as a family company in Mannheim over 90 years ago, today the FUCHS Group employs almost 6,000 people worldwide. We are a global company with a revenue base in Western Europe, Asia, and North America. We pride ourselves on delivering high-quality lubrication solutions and services that optimize our customers' businesses.

With over 60 operating companies around the world, we develop, produce and sell a comprehensive portfolio of lubricants and related specialty products for virtually all sectors and areas of application. Our customers include automotive suppliers, OEMs, and companies from the mechanical engineering, metalworking, cement mining, aerospace, power generation, glass transport, agriculture and forestry industries, and more. With our drive for innovation and the specialized expertise of our internationally networked teams, we continue to set the standard for the lubrication industry.

Facts and Figures

Headquarters: Mannheim, Germany

Product range: The FUCHS Group offers a full range of over 10,000 products for all fields of application

Certifications: ISO 9001:2014, ISO/ TS 16949:2014, ISO 14001:2015, BS OHSAS 18001:2013

**All your needs covered.
Your lubricants
and solutions for
all applications.**



To meet the harsh demands of the cement industry, you need a lubrication partner with the expertise and in-depth knowledge required to support you throughout the manufacturing process and beyond. A partner that provides the full range of lubricants and solutions for all cement plant applications – right around the globe. Highly dedicated and skilled experts that are always there for you whenever you need them. A wide range of services to ensure the performance, efficiency, and process reliability of your equipment. You can focus on what you do best – manufacturing cement.

Cement production takes place in a highly demanding environment. In no other industry are machines subjected to such massive loads, strong vibrations, and extreme temperatures. This poses huge demands on you as a cement plant operator. In close cooperation with plant and machine manufacturers, FUCHS has risen to meet these challenges by developing a full range of innovative and heavy-duty lubricants covering all applications in the cement industry. From engine oil for mobile equipment in quarries to heavy-duty greases and oils for crushers, mills, kilns, and roller presses – our innovative product solutions cover all your lubrication needs. Application-specific solutions help to effectively protect your key machinery from wear, increase maintenance intervals, and prolong the life of your equipment. The result: better cost efficiency.

Over the past 60 years, FUCHS has become THE worldwide specialist in cement applications. Today, we are close to our customers all over the world, supporting them in every step of their processes. Your challenges are our challenges – throughout manufacturing and beyond. Our global expert network allows us to provide you with precisely the right products and solutions – right when you need us. With our regional production sites, we are always available – no matter where you are.

High-performance lubrication solutions are crucial for smooth and reliable operation of your plant. In combination with our comprehensive application-based services, they develop maximum effect: specialized service engineers provide you with on-site technical consulting and training to ensure performance, efficiency, and process reliability. Our experts offer a wide range of services including inspections, oil analysis, Open Gear repair, and total fluid management, including software solutions. No matter what you need, we are here for you: your single-source lubrication partner for the cement industry.

Choose FUCHS and benefit from:

- The expertise of THE worldwide partner of the cement industry.
- Lubricants and solutions for every application, from quarry to dispatch.
- A global expert network with the most profound technical expertise in the industry.
- Comprehensive service solutions for maximum machine availability, production safety, cost reduction, and reliability.



YOUR FULL-SOLUTION LUBRICATION PARTNER IN THE CEMENT INDUSTRY

THE WHOLE RANGE OF LUBRICANTS

Whether your applications involve the lubrication of crushers, mills, grinding rollers, kilns, or excavators, FUCHS is the strong and reliable partner for you, providing solutions for all requirements of the cement industry – including all relevant approvals.

We want your machines to perform at their best – every day. With FUCHS, you can enjoy the full range of high-performance lubricants from a single source – your plant will also benefit from higher efficiency and productivity.

THE WHOLE WORLD OF CEMENT

No matter where you are located, you benefit from our excellent industry know-how as an expert global leader. Close to your business in every step of the process, we provide timely solutions to all your needs, supporting you in mastering all your lubrication challenges throughout manufacturing and beyond.

THE WHOLE SCALE OF CUSTOMER CARE

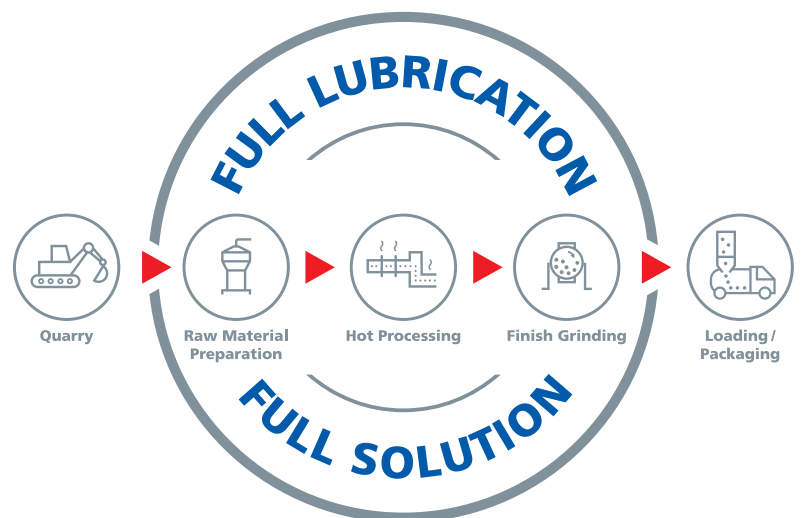
Your machines are exposed to a demanding environment. High-performance lubricants are crucial to your success. Ensuring maximum machine availability and productivity involves more – we are the partner to provide it. Our application specialists are on site to analyze, inspect, and help to maintain your equipment. Exceptional know-how and specialized software in combination with training and advice keep your plant running smoothly. Take your business to the next level.





THE WHOLE PROCESS COVERED – FROM QUARRY TO LORRY.

From engine oil for mobile equipment in quarries to heavy-duty greases and oils for crushers, mills, kilns, and roller presses – our innovative product solutions cover all your needs.





FULL LUBRICATION **QUARRY**





Excavators and Trucks

Excavators and trucks work in very harsh conditions. Vibration, dust load, and environmental conditions are the biggest challenges facing the lubricated parts. FUCHS lubricants from the TITAN, RENOLIT, and LAGERMEISTER range offer optimum protection of pins and bushes, slewing rings, hydraulics, and the drivetrain.

Greases

Pins and Bushes:

RENOLIT CXS GSM/S
LAGERMEISTER EP 2

Slewing rings:

RENOLIT CXS GSM/S (bearing and gear)
CEPLATTYN KG 10 HMF (gear only)
LAGERMEISTER EP 2 (bearing only)

Oils

Hydraulics:

RENOLIN B Range
RENOLIN MR Range

Engines* for trucks/excavators:

TITAN TRUCK PLUS SAE 15W-40
TITAN CARGO SAE 15W-40

Engines* for passenger cars:

TITAN SUPERSYN SAE 5W 40

Gears:

TITAN SUPERGEAR SAE 80W-90

Crusher

Crushing can be done by, for example, an impact crusher, a cone crusher, or hammer crusher. The bearings of these crushers are exposed to extreme vibration loads, dust, and environmental conditions. Therefore, greases with extreme working stability, extreme pressure resistance, and good sealing capabilities are to be used.

RENOLIT CXS-GSM/S and LAGERMEISTER XXL fulfill these demands. Even at low temperatures, they are pumpable in central lubrication systems.

RENOLIT CXS-GSM/S and LAGERMEISTER XXL ensure safe running conditions at maximum service intervals.

Dust Suppression

Especially in dry climates, the environmental impact of dust from the quarry can be immense.

A standard method to reduce dust is spraying water with a water truck. In order to reduce water consumption and to prolong spraying intervals, FUCHS developed RENOCLEAN AIR HOLD-DOWN. Designed to be diluted into water-based applications.

* Please contact FUCHS if special approval is needed



FULL LUBRICATION RAW MATERIAL PREPARATION

Blending Beds

No other moving parts in the cement industry are exposed to dusty environments and their highly abrasive nature as much as conveyor chains of blending beds. That causes extreme wear on chain links, chain bolts, and sprocket wheels. Chain oils with minimum dust attraction but good lubrication properties are necessary to prolong the lifetime and maintenance cycles of this equipment.

STABYLAN G 1000 provides very good creeping properties to reach and lubricate the inner chain. Friction and wear are drastically reduced. Throw-off losses are minimal. The graphite content of STABYLAN G 1000 offers excellent emergency running properties.





Gebr. Pfeiffer SE

Vertical Mills and Grinding Rollers

Vertical mills are commonly used for raw material and clinker grinding. In terms of lubrication, the most critical parts of vertical mills are the bearings of the grinding rollers, the separator bearings, and the gearbox. The bearings of the grinding rollers are exposed to extremely high vibrations (short-time overloads), elevated temperatures, and, depending on their design, the dust-loaded environment within the grinding chamber.

GEARMASTER PGP 680 and 1000 as well as GEARMASTER SYN 1000* were especially developed for the lubrication of such highly loaded bearings. They are based on a fully synthetic oil, thus ensuring highest lubrication films under extreme temperatures and loads.

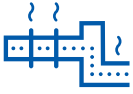
Vertical Mills, Separator Bearings, and Gearboxes

Separator bearings of vertical mills face a critical combination of load, revolutions, and size. In addition, they are positioned in the airstream and thus heavily exposed to increased temperatures and dust.

URETHYN MP 2 was especially developed to lubricate these bearings. It provides a good pumpability and guarantees excellent lubricity under elevated temperatures and loads.

RENOLIN CLP 320 as well as GEARMASTER CLP 320 are widely approved by the manufacturers of gearboxes for vertical mills.

FUCHS also provides fully synthetic gear oils in order to achieve oil changing intervals of up to three years and beyond. These products are RENOLIN UNISYN XT 320 and GEARMASTER SYN 320.



FULL LUBRICATION HOT PROCESSING

Kiln and Open Gear

Most kilns and in particular kilns with more than two roller stations are equipped with an Open Gear drive. The tooth flanks of kiln gears are exposed to radiation heat from the kiln shell and, compared to other Open Gears, are subjected to axial movements. Due to slow sliding movements between the tooth flanks, solid lubricant containing Open Gear lubricants are the optimum solution.

In general the CEPLATTYN KG 10 HMF range containing graphite as well as the light-colored CEPLATTYN GT range are the best solutions for Open Gear lubrication on kilns.

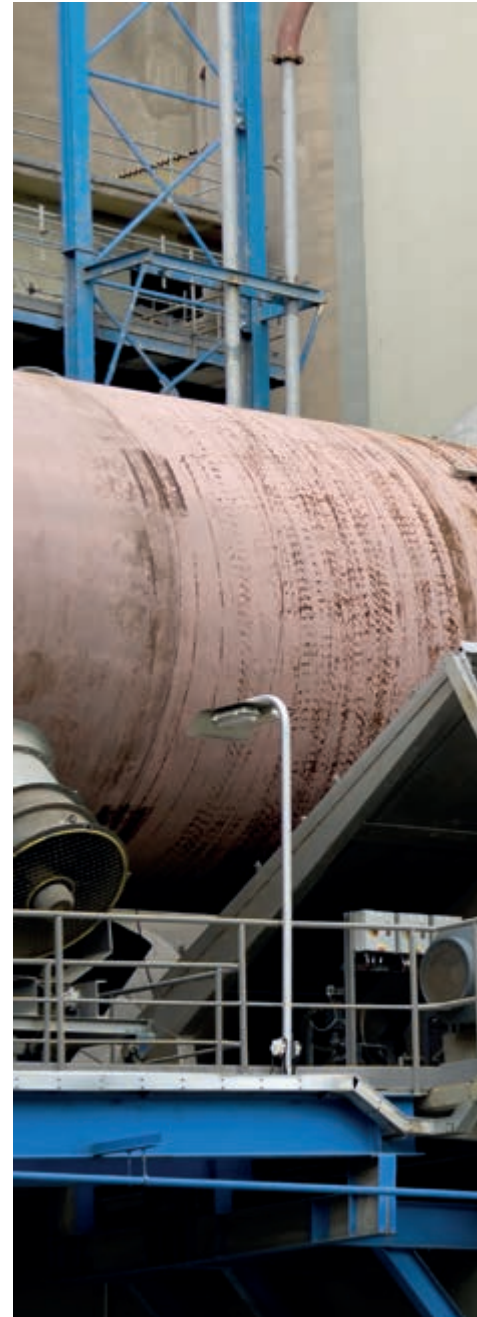
Because of their high solid lubricant content and their elevated base oil viscosity, both CEPLATTYN grades provide excellent wear protection even under critical running conditions.

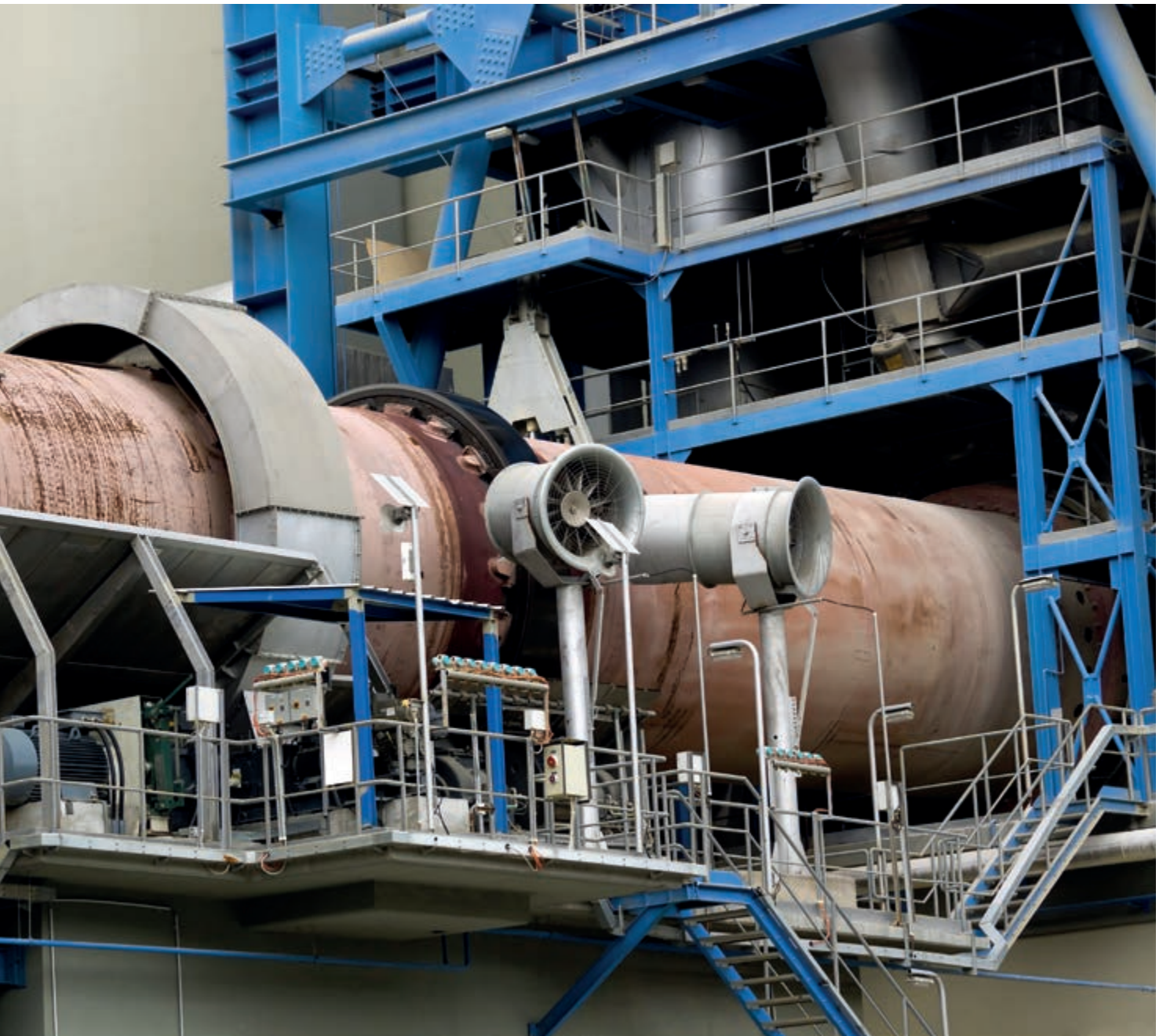
Kiln, Tyre Ring

Tyre rings on kilns have to compensate the heat extension of the kiln shell, keep the kiln shell in its circular shape, and prevent the kiln from bending. As a kiln tyre is never entirely fixed to the kiln shell, it needs to be lubricated to avoid it from seizing up and wearing between the tyre pads and the tyre itself. Any moving parts of semifixed tyres have to be lubricated as well.

CEPLATTYN HT is the most reliable lubricant for this task. It is easy and safe to apply using conventional spray units. The product penetrates into the inner tyre ring, their base fluids evaporate slowly, and the high content of solid lubricants stays in the tyre for safe, long-term dry film lubrication.

The copper pastes GLEITMO 160 NEU and PBC are used for additional maintenance lubrication during shutdown and for mounting purposes.





Traveler Grate/Cooler

Depending on its design, a traveler grate can be equipped with many bearings operating under exposure to the radiation heat from the hot clinker. To keep these bearings running, high volumes of standard greases have to be used. However such greases fail frequently because they harden in the feeding lines.

STABYL LR was especially developed to meet these requirements. It will not harden under elevated temperatures; its high-temperature thickener system combined with its increased base oil viscosity guarantees reliable lubrication with a minimum amount of grease.

In addition, STABYL LR is used as a high-performance multipurpose grease for all considerably thermally loaded bearings.



FULL LUBRICATION **FINISHING GRINDING**





Roller Press

Roller presses are used for raw-material preparation and finish grinding. The high-pressure grinding bed built between the two rollers leads to a significant reduction of energy consumption compared to common ball mills. Bearings of roller presses are subject to extremely high shock loads and, especially in the finish-grinding process, to elevated temperatures. In terms of lubrication, grease-lubricated bearings have to be distinguished from oil-lubricated bearings.

In grease-lubricated bearings, the grease is fed in relatively high volumes using conventional lubrication systems. The high volumes are necessary to provide a sufficient sealing effect on the bearing to prevent the backflow of dust from the grinding chamber into the bearing.

Greases for the grinding bearings have to be extremely stress resistant and have to provide a good damping effect to "cushion" the bearings. In addition to that, a good self-sealing effect is required to prevent dust backflow from the grinding chamber to the inner bearing. STABYL HD is the most suitable and widely approved lubricant for these bearings. Its high base oil viscosity and its content of solid lubricants provide the ideal combination for these extremely challenging conditions.

Oil-lubricated bearings are equipped with a fully sealed circulation system. GEARMASTER SYN and GEARMASTER ECO are synthetic oils for these systems.

Ball Mill

Even though ball mills are gradually being replaced by vertical mills and roller presses, they are still the most common grinding systems in today's cement plants. The majority of ball mills are driven by Open Gears. Some have central drives or enclosed gear/bearing arrangements.

CEPLATTYN is the first choice for spray, bath, and circulation lubrication of Open Gears. It is available as black graphite containing grease, a light-colored fluid, or as a light-colored fluid with white reactive solid lubricants.

The entire CEPLATTYN range is the life insurance for an Open Gear drive. For mills driven by central-gear drives or closed-gear arrangements, the GEARMASTER CLP range and the RENOLIN CLP are the widely approved choice.



FULL LUBRICATION LOADING AND PACKAGING

Silos/Packaging/Loading

Within the cement storage and packaging section, different machine parts need to be lubricated. Silos are equipped with small, open running-gear drives for the discharging unit. They have to be lubricated by CEPLATTYN BL if applied via automatic greasers, or by CEPLATTYN 300 if applied manually.

Bearings and conveyors and various parts of bag packaging machines are to be lubricated with an extreme pressure (EP) grease such as RENOLIT EP 2.

LAGERMEISTER XXL, as a sophisticated solution, provides a state-of-the-art option. Its stable thickener system and elevated base oil viscosity allow LAGERMEISTER XXL to be widely used as a multipurpose grease within a cement plant where moderate to high temperatures or medium to high loads are to be covered. It is compatible with most other greases.

Bearings (Grease Lubricated)

For the general lubrication of bearings and as a general-purpose solution for a wide range of applications in a cement plant, LAGERMEISTER XXL is the optimum solution. Its stable thickener system and its compatibility with most other greases allow its use in most bearings.

The standard extreme pressure grease RENOLIT EP 2 provides a good solution for low- to medium-loaded bearings.

Gears

FUCHS covers the complete range of industrial gear oils based on mineral oils and synthetic base oils (poly-alpha-olephine, polyalcyene glycol, and ester).

RENOLIN and GEARMASTER gear oils ensure the latest additive technology and are approved by key gear manufacturers and bearing manufacturers as well as component and machine manufacturers within the cement industry.

With its latest development, RENOLIN UNISYN XT FUCHS provides the most advanced technology for saving energy and extended oil changing intervals.





FULL SOLUTION INSPECTION AND REPAIR OF OPEN GEARS



For drive units that are lubricated with CEPLATTYN, our service engineers carry out regular inspections over the entire service life. The service engineer takes extensive measurements (e.g. vibrations, tooth flank temperatures), which are recorded in the FUCHS LUBRICANTS INSPECTOR, an online documentation system, and is available to our customers at any time.

Regular Inspection of Open Gears

For Open Gear units, our service engineers carry out regular inspections over the entire service life.

This consist of, for example:

- Measuring vibrations of pinion bearings
- Dynamic check of contact patterns
- Measuring tooth flank temperatures
- Video thermography
- Checking lubrication system

All findings are saved in the FUCHS LUBRICANTS INSPECTOR, a online documentation system where data, trends, and comments are available at any time.

Measuring Vibrations of Pinion Bearing



Dynamic Check by Infrared Video Thermography



Extended Service

Repair and optimization of damaged tooth flanks on Open Gear drives is part of the extended service offered by FUCHS. Such work is primarily a matter of the mechanical treatment of the working tooth flanks by grinding pittings, smoothing scuffings, and

forced running-in and assistance with alignment of the transmission gears. On heavily worn-out or damaged tooth flanks, FUCHS LUBRITECH provides complete re-profiling of the entire gear set.

Before Re-Profiling



After Re-Profiling



FUCHS SERVICE SOLUTIONS FOR THE CEMENT INDUSTRY

In addition to the most complete lubricant range for the cement industry, FUCHS offers a comprehensive range of services and maintenance tools for its customers.

These Service tools can be chosen selectively or as complete packages, depending on your needs and demands.

LUBRICATION AND MAINTENANCE ACADEMIES

In-house and on-site seminars for:

- Basics of lubricants
 - Basics of lubrication systems
 - Calculation of lubrication volumes and intervals
 - Root causes of gear and bearing damage
 - Oil and grease sampling/reading of analysis
-

PLANT – LUBRICATION SURVEY

On-site lubrication and application survey in order to:

- Improve current lubrication routine
 - Reduce number of lubricants
 - Reduce lubricant consumption
 - Optimize lubricant storage
 - Reduce cost of lubrication
-

OIL AND GREASE ANALYSIS

CENT oil analysis

- State-of-the-art preventive maintenance tool
 - Indicates, for example, wear additive level, and source of contamination
-

INVENTORY/PROCUREMENT MANAGEMENT

Inventory/procurement management*

- Provide consignment stock (inventory management)
 - Procurement and purchasing of all lubricants
 - Reduction of lubricant variety
 - Centralized organization of all documents
-



CHEMICAL PROCESS MANAGEMENT

Chemical process/Fluid Management*

- Check and refill for all lubrication units
- Reporting and documentation
- Identifying and executing permanent improvements

ON-SITE MACHINE MONITORING

On-Site Machine Monitoring

- Check environment
- Check lubrication systems
- Monitor temperatures and vibrations
- Documentation and Trending

HIGH PRESSURE CLEANING

Dynamic high pressure cleaning of large lubricated machine parts

- Quick de-greasing of Open Gears
- Cleaning of large chains and bearings, etc.
- Cleaner with excellent lubrication properties

DATA SOLUTIONS SOFTWARE

CENT oil analysis

- Condition data
- Recommendations
- Trends

OPEN GEAR REPAIR SERVICE

Open Gear repair

- Pitting grinding
- Assistance in alignment
- Re-Profiling

FUCHS LUBRICANTS INSPECTOR

- Condition check of Open Gears
- Vibrations/temperatures
- Infrared images/videos
- Trends
- Recommendations

FLUIDS LIVE lubrication management

- Scheduling of lubrication and repair services
- Inventory control
- Analysis of lubricant consumption
- Integrated KPI measurements

* Availability needs to be checked with local FUCHS entity

THE RIGHT LUBRICANT FOR EACH PROCESS STEP

Product	Type of Lubricant	Machine Component
RENOLIN CLP 220/320 GEARMASTER CLP 220/320	Extreme pressure oil Mineral	Kiln: bearings of support and thrust rollers Mills: bearings of pinions and trunnion
RENOLIN UNISYN XT 220/320 GEARMASTER SYN 220/320	Extreme pressure oil Synthetic/elevated temperatures	Kilns: bearings of support and thrust rollers (high temperatures) Mill: bearings of pinions and trunnion
RENOLIN CLP Range	Extreme pressure gear oils Mineral	All types of gearboxes
RENOLIN UNISYN XT Range	Extreme pressure gear oils Synthetic Energy-saving/prolonged change intervals	All types of gearboxes
RENOLIN B Range	Hydraulic oils Mineral	Hydraulic systems (mobile and stationary)
RENOLIN MR Range	Hydraulic oils Challenging conditions	Hydraulic systems (mobile and stationary)
RENOLIN SilverScrew Range	Compressor oil Longlife	Screw compressors
RENOLIN GoldScrew Range	Compressor oil Extreme-longlife	Screw compressors
RENOLIN UNISYN OL Range	Compressor oil Synthetic	Piston compressors
CEPLATTYN KG 10 HMF Range	Grease, black with graphite	Open Gears on mills and kilns Spray application
CEPLATTYN GT Range	Fluid, milky color, white solid lubricants	Open Gears on mills and kilns Spray, bath, and circulation application
CEPLATTYN SF Range	Oil, high viscosity, light color	Open Gears on mills Spray, bath, and circulation application
CEPLATTYN HT	Fluid, extreme high temperature, with graphite	Kiln, tyre ring Spray application
STABYL HD	Grease heavy-duty with black solid lubricants	Roller press: main bearings, slide rails
GEARMASTER ECO 460/680	Oil, synthetic	Roller press: KHD only (in combination with STABYL ECO EP 2)
STABYL ECO EP 2	Grease, semi-synthetic	Roller Press: Labyrinth Seal KHD only
GEARMASTER SYN 460/680	Oil, synthetic	Roller press: KHD only (in combination with LAGERMEISTER TS)
LAGERMEISTER TS	Grease, semi-synthetic	Roller Press: Labyrinth Seal KHD only
GEARMASTER PGP 680/1000 GEARMASTER SYN 1000	Extremely high pressure oil Fully synthetic	Vertical mill: bearings of grinding rollers
URETHYN MP 2	High performance grease Combination of high temperatures with high loads	Bearings of separators, especially on vertical roller mills

Product	Type of Lubricant	Machine Component
RENOLIT CXS GSM/S LAGERMEISTER XXL	Multi-purpose grease High loads	Bearings in various machines, also crushers
RENOLIT CXS GSM/S	Multi-purpose grease Heavy-duty	Excavator, slewing ring, pins, and bushes
RENOLIT EP 2 LAGERMEISTER EP 2	Multi-purpose grease	Bearings and slide ways in e.g. packaging machines, conveyor belts, etc.
TITAN SUPERSYN SAE 5W-40	Engine oil Synthetic	Passenger cars and light trucks
TITAN TRUCK PLUS SAE 15W-40	Engine oil	Vehicles with gasoline and highly loaded diesel engines
TITAN CARGO SAE 15W-40	Engine oil	Commercial diesel engines (extended service intervals, exhaust after treatment, turbo-charger)
AGRIFARM UTTO MP	Automotive multifunctional oil	Automotive transmission and hydraulic systems with integrated wet brakes, clutches, and differentials
TITAN SUPERGEAR SAE 80W-90	Automotive gear oil	Gears with extended oil-change intervals

MAINTENANCE PRODUCTS

Product	Type of Lubricant	Machine Component
GLEITMO 160 NEU	Copper paste for maintenance purposes	Kiln: tyre ring retainers
STABYLAN G 1000	Oil for chains	Roller press: main bearings, slide rails
CEPLATTYN CLEANER	Metal cleaner	Dynamic cleaning of Open Gears and industrial parts
RENOLIN AIR HOLD-DOWN	Dust suppressant for roadways and stock-piles	Water truck

| The **FUCHS** Group

Developing Tailor-Made, Holistic Solutions for the Most Demanding Challenges

Our international team of experts from across all sectors and industries focus solely on lubricants, so that our customers can focus on their businesses. It's our mission to ensure that we deliver technology that pays back.

Your Local Contact:



Your Global Contact:

Klaus Holz
Head of Global Business Segment CEMENT

FUCHS LUBRITECH GmbH
Werner-Heisenberg-Strasse 1
67661 Kaiserslautern, Germany
Phone: +49 6301 3206-0
E-mail: cement@fuchs.com