Specialty Lubricants for the Cement Industry

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LUBRITECH
Special Application Lubricants

LUBRICANTS. TECHNOLOGY. PEOPLE.

FUCHS LUBRITECH – Special Application Lubricants

Within the FUCHS Group, we at FUCHS LUBRITECH are the experts for highly specialised applications. We develop, produce and distribute the world's leading branded products of our own. Our employees are committed to solving your challenges. We are there, with you and for you.

LUBRITECH
Special Application Lubricants

Facts and figures

Company: FUCHS LUBRITECH GmbH, part of the FUCHS Group, based in Kaiserslautern, Germany

LUBRITECH: the Special Application Lubricants Division of the FUCHS Group

Product range: LUBRITECH GROUP offers a full range of more than 1,000 special products, including food grade lubricants, adhesive lubricants, lubricating fluids and greases, pastes, solid film lubricants, concrete release agents, aerosols and metal-forming lubricants

Certifications: ISO 9001: 2008, ISO 21469, Halal, Kosher

FUCHS has developed, produced, and sold lubricants and related specialties for more than 80 years – for virtually all applications and sectors. With over 100,000 customers and 50 companies worldwide, the FUCHS Group is the world's leading independent lubricant supplier.

Within the FUCHS Group, **FUCHS LUBRITECH** is the expert for Special Application Lubricants. A team of more than 500 specialists around the world work to meet your needs. However demanding the application, we offer a specialised solution. Service is a crucial and fundamental component of our offering. Our experts offer on-site technical consultation to assure performance, efficiency and process reliability.

FUCHS LUBRITECH special lubricants stand for the highest performance and sustainability, safety and reliability as well as efficiency and cost savings. They represent a promise: **technology that pays back.**

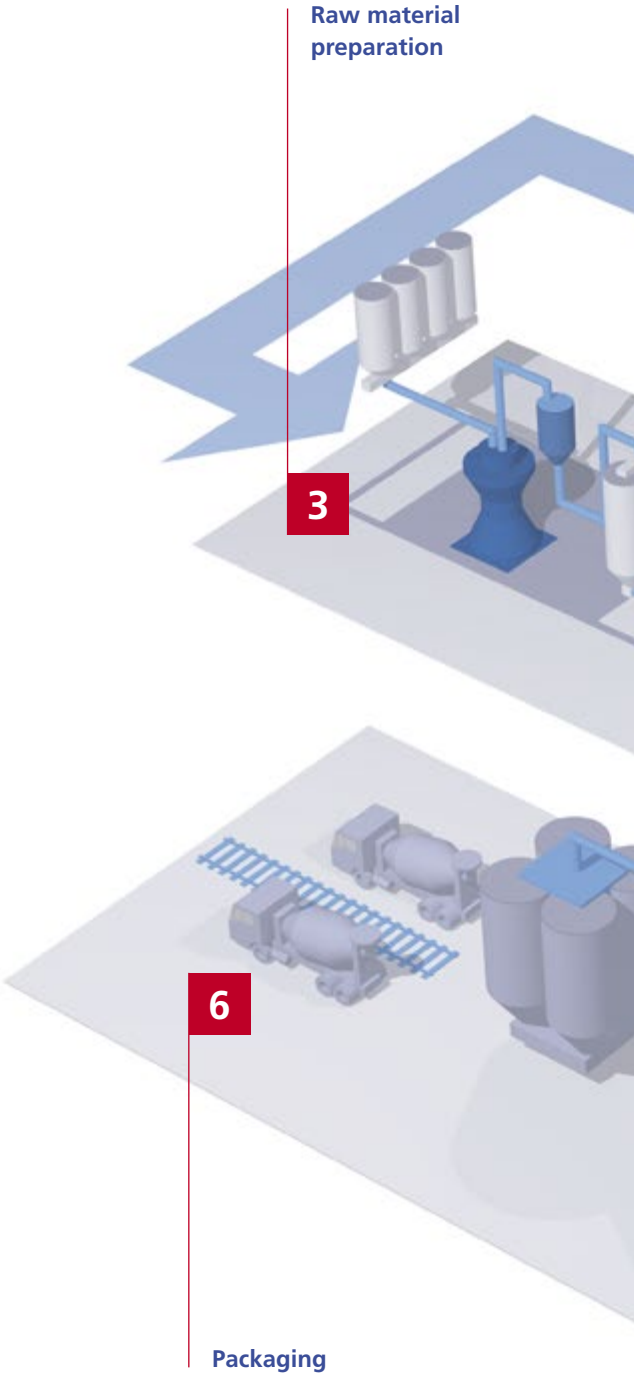
SPECIALTY LUBRICANTS FOR THE CEMENT INDUSTRY

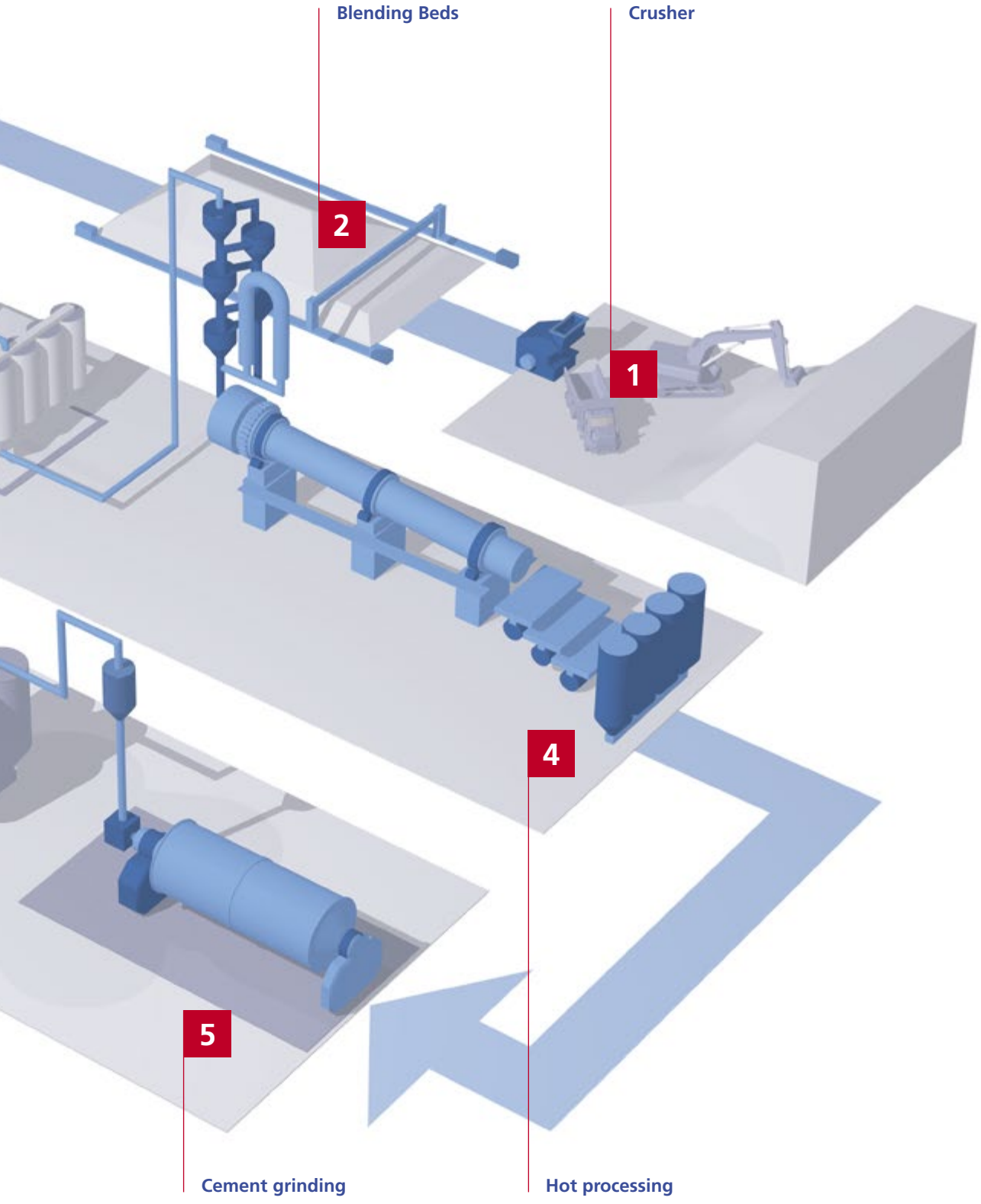
Machines that are used in cement production are subjected to massive loads, strong vibrations and extreme temperatures. Together with gear and machinery manufacturers, we develop innovative specialty lubricants for crushers, mills, rotary kilns and roller presses. In doing this, we strive for highly application-specific solutions which help to effectively protect key machinery parts from wear, increase maintenance intervals and prolong the life of your equipment.

High-performance lubricants for the most demanding applications

Within cement manufacturing some machines occupy a key position in the production process. Among these are kilns and machines for material preparation, such as crushers, mills and roller presses.

To achieve the required production reliability these machines have to be well maintained and serviced, and, for moving equipment, the most important part of the maintenance is lubrication. The selection of the correct lubricant is therefore essential to the reliability of the manufacturing process.




Blending Beds
Crusher
2
1
4
5
Cement grinding
Hot processing

Raw material preparation

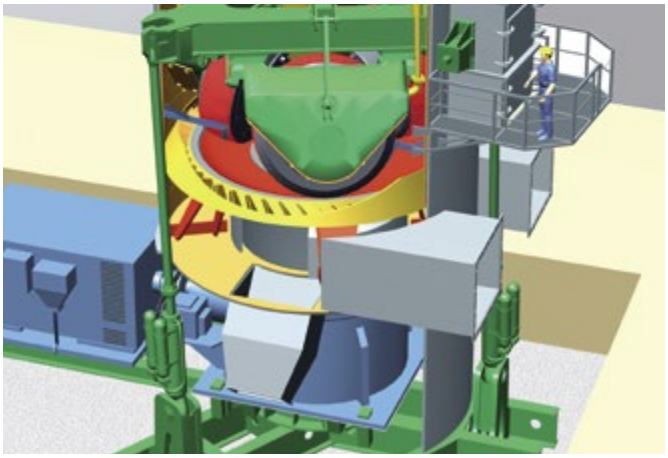


Foto: Gebr. Pfeiffer SE

Crusher

The first step in raw material preparation is crushing. This can be done e.g. by impact crusher, cone crusher or hammer crusher. The bearings of these crushers are exposed to extreme vibrations loads, dust and environmental conditions. Therefore greases with extreme working stability, exceptional pressure resistance and good sealing capabilities are to be used.

URETHYN MP 2 and LAGERMEISTER XXL fulfil these demands. Even at low temperatures they are pumpable in central lubrication systems. URETHYN MP 2 and LAGERMEISTER XXL warrant safe running conditions at maximum service intervals.

Vertical mills, grinding rollers

Vertical mills are commonly used for raw material and cement 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 were especially developed for the lubrication of such highly loaded bearings. They are based on a fully synthetic oil, thus ensuring thickest lubrication films under extreme temperatures and loads.

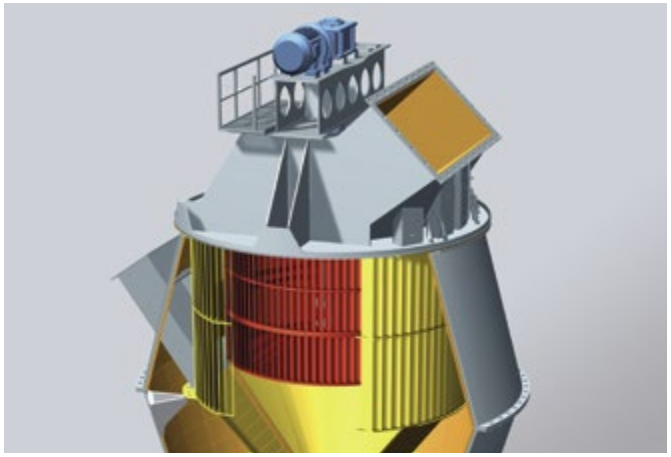


Foto: Gebr. Pfeiffer SE

Vertical mills, separator bearings, 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 elevated temperatures and dust.

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

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.

Hot processing

Foto: ThyssenKrupp Polysius AG

Kiln, Open Gear

Most small kilns and in particular kilns with more than 2 roller stations are equipped with an open running 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, graphite-containing CEPLATTYN KG 10 HMF as well as the light-colored CEPLATTYN GT range are the best solutions for open gear lubrication on kilns.

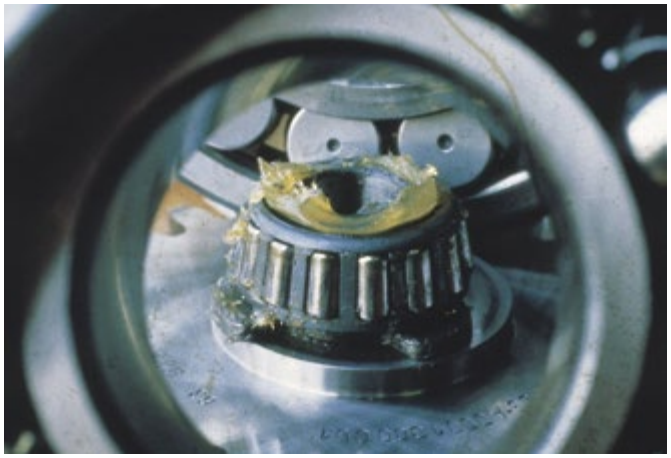
Because of their high solid lubricant content and their elevated base oil viscosity, both CEPLATTYN grades provide an excellent wear protection even under critical running conditions.

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 seizure and wear between the tyre pads and the tyre itself. Any moving parts of semi-fixed tyres have to be lubricated as well.

CEPLATTYN HT and CEPLATTYN TL are reliable lubricants for this task. They are easy and safe to apply using conventional spray units. Both products penetrate into the inner tyre ring, their base fluids evaporate slowly, and their high content of solid lubricants stays in the tyre for a 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.



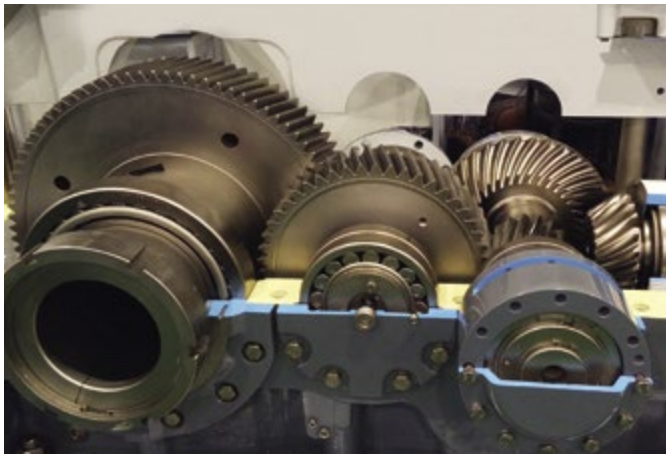


Foto: Gebr. Pfeiffer SE

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 high base oil viscosity guarantees a reliable lubrication with minimum grease quantities.

In addition, STABYL LR is used as a high-performance multi-purpose grease for all considerably thermally loaded bearings in classifiers, crushers, sieves, etc.

Gearbox

Within a cement plant many high powered gearboxes transmit forces to drive different machines. This can be the back gear or the planetary gear for the drive of the kiln, the central drive or back gear of a tube mill, the gearbox of a vertical mill or a roller press or drives for crushers, traveler grates and various conveyor belts. All these gears have one thing in common: The challenging environment in a Cement Plant.

The GEARMASTER range provides a solution for every single gearbox within a Cement Plant. GEARMASTER CLP is a mineral oil-based gear oil allowing longest service intervals compared to standard mineral oils. GEARMASTER SYN is a synthetic gear oil providing maximum energy efficiency as the optimum solution for gears running at elevated temperatures or in critical climatic regions.

Cement grinding/packaging

Foto: ThyssenKrupp Polysius AG

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.

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 a back-flow of dust from the grinding chamber into the bearing.

Greases for the grinding bearings have to be extremely stress resistant and must provide a good damping effect to “cushion“ the bearings. In addition to that a good self-sealing effect is required to prevent a 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 the widely approved synthetic oils to be used in 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 is driven by Open Gears. Some have central drives and 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 as light-colored fluid, or as 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 is the widely approved choice.

Silos/packaging/loading

Within the cement storage and packaging section different machine parts need lubrication. 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 of conveyors and various parts of sack packaging machines are to be lubricated by a state-of-the-art grease such as LAGERMEISTER XXL. Its stable thickener system and elevated base oil viscosity allow LAGERMEISTER XXL to be widely used as a multi-purpose 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.

Service – inspection and repair

Regular inspection of Open Gears

For drive units that are lubricated with CEPLATTYN, our service engineers carry out regular inspections over the entire service life. They make written notes of the general operational status, ascertain the amount of wear on the load-carrying tooth flanks, check the spray lubrication and, if necessary, reset it. In addition, the service engineer takes extensive measurements (oscillation speed, flank temperature, etc.), which are recorded in the FLT INSPECTOR, a modern documentation system, and are always available to our customers.

Measuring vibrations of the pinion bearing

Measuring the tooth flank temperature

Dynamic check of the contact pattern with a stroboscope

Dynamic check by infrared video thermography

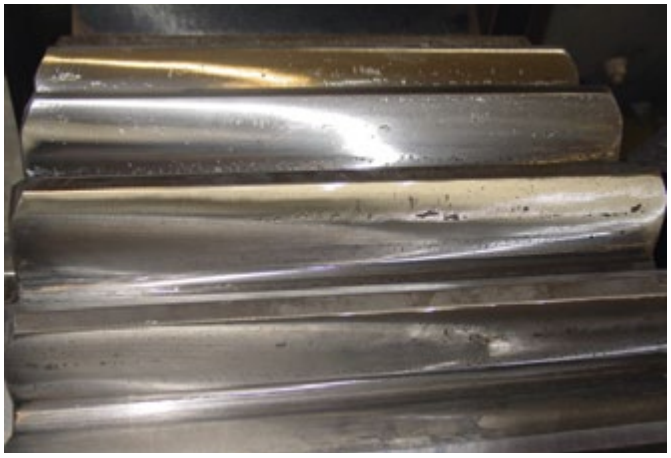
Repair service

The repair of damaged tooth flanks on Open Gear drives is part of the extended service offered by FUCHS LUBRITECH. Such repair work is primarily a matter of the mechanical treatment of the working tooth flanks by grinding pittings or larger breakages, smoothing scuffings, forced running-in and assistance with alignment of the transmission gears. On heavily worn-out or damaged tooth flanks FUCHS LUBRITECH can provide complete reprofiling of the entire gear set.

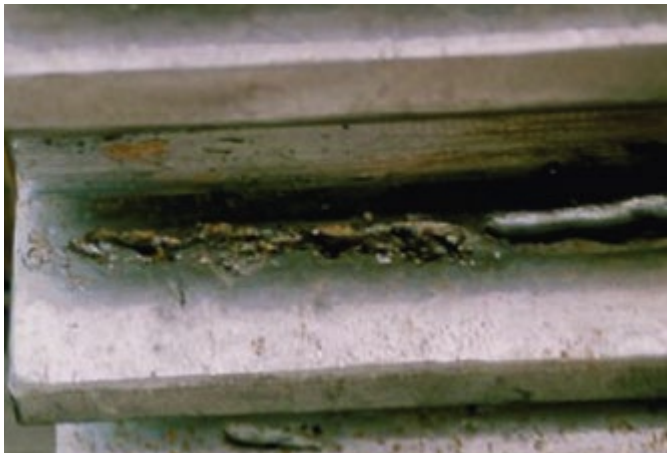
Tooth flanks before grinding

During grinding process

Tooth flanks after grinding



Older pitting and reworked pitting



FLT INSPECTOR – online documentation

With the FLT INSPECTOR, FUCHS LUBRITECH is making a unique online documentation database with an integrated, graphical trend analysis available that enables the customer to retrieve all relevant information on their system and the lubricants used at any time.

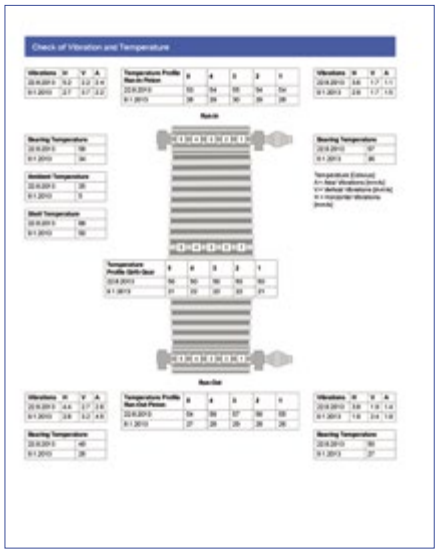
The open gear service, combined with the online provision of inspection reports, is a further step towards being able to operate open running drives reliably.

Your benefits with the FLT INSPECTOR

- Availability of all reports at a glance
- Online access at any time
- Instant check via a traffic light system
- Graphical trend analysis for temperatures and vibrations
- Rapid transmission of data and reports
- Individual access hierarchy
- Optional extra information (attachments) for each inspection report
- App solution for mobile devices

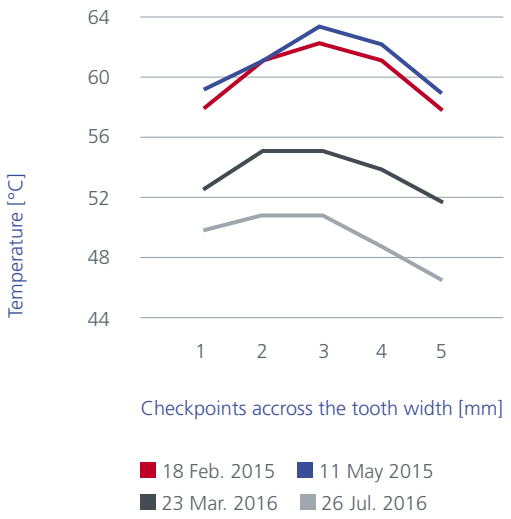
Sample report from our FLT Inspector

First part of the inspection report contains customer and system data, as well as images and comments.



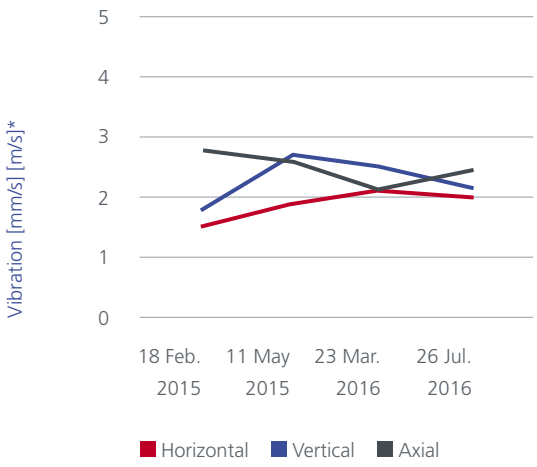
Measurements of values for temperatures and vibrations, including reference values relating to the previous inspection, can be found in this second part.

Tooth flank temperature run-in pinion



Graphic trend analysis enables informative display of temperatures and vibrations over time.

Vibration run-out of pinion/fixed end



The right lubricant for each process step

Product	Type of lubricant	Machine component
CEPLATTYN KG 10 HMF range **CEPLATTYN GT 10**	Sprayable grease, black/light coloured fluids with white solid lubricants	Kiln/Open Gear
CEPLATTYN HT **CEPLATTYN TL**	Sprayable high-temperature fluids with solid lubricants	Kiln/inner tyre ring
GEARMASTER CLP 220/320 **GEARMASTER SYN 220/320**	Extreme pressure oils based on mineral or synthetic oil	Kiln/bearings of support and trust rollers
GLEITMO 170 NEU **PBC range**	Pastes for additional maintenance and during shut-down	Kiln/tyre ring
GEARMASTER CLP 220 **GEARMASTER SYN 220**	Gear oils, mineral oil-based or synthetic oil-based	Kiln/back gear
CEPLATTYN KG 10 HMF range **CEPLATTYN SF range** **CEPLATTYN GT range**	Sprayable grease, black/light coloured fluids with white solid lubricants	Ball mill/Open Gear
GEARMASTER CLP 220/320 **GEARMASTER SYN 220/320**	Extreme pressure oils, based on mineral or synthetic oil	Ball mill/pinion bearings
GEARMASTER CLP 220/320 **GEARMASTER SYN 220/320**	Extreme pressure oil, based on mineral or synthetic oil	Ball mill/trunion bearings
GEARMASTER CLP 220 **GEARMASTER SYN 220**	Extreme pressure oil, based on mineral or synthetic oil	Ball mill/back gear
GEARMASTER PGP 680/ **GEARMASTER PGP 1000** **GEARMASTER SYN 1000** (FLSmidth only)	Extreme pressure oil, based on synthetic oil	Vertical mill/grinding roller
GEARMASTER CLP 220 **GEARMASTER SYN 220**	Extreme pressure oil, based on mineral or synthetic oil	Vertical mill/main gearbox
URETHYN MP2	Special grease for high temperature and high loads	Vertical mill/separator bearings
STABYL HD	Heavy-duty grease with solid lubricants	Roller press (grease lubricated)/ main bearings and slide rails
GEARMASTER ECO 460/680 **GEARMASTER SYN 460/680** **STABYL ECO EP2** **LAGERMEISTER TS**	Extreme pressure oil, based on synthetic oil/grease for labyrinth sealing	Roller press (oil lubricated)
URETHYN MP2 **LAGERMEISTER XXL**	Heavy-duty bearing grease	Crusher/bearing
STABYL LR	High-temperature grease	Traveler grate/bearings
STABYLAN G 1000	Graphite-containing chain oil	Blending bed/chains
CEPLATTYN BL **CEPLATTYN 300**	Adhesive lubricant with graphite	Silo/gear of discharger
LAGERMEISTER XXL	Multi-purpose grease	Packaging machines/bearings
GEARMASTER CLP 220/320 **GEARMASTER SYN 220/320**	Gear oils, based on mineral or synthetic oil	Gearboxes/various applications
LAGERMEISTER XXL	Multi-purpose grease	Bearings/various applications

FUCHS LUBRITECH – Special Application Lubricants

Innovative lubricants need Experienced application engineers

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

Contact:

Global Headquarters
FUCHS LUBRITECH GmbH
Werner-Heisenberg-Strasse 1
67661 Kaiserslautern/Germany
Tel.: +49 (0) 6301 3206-0
info@fuchs-lubritech.de
www.fuchs.com/lubritech

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