KLÜBER LUBRICATION

your global specialist

Detailed information

Speciality Lubricants for Processing Plants in the Mining Industry.

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Speciality Lubricants from Klüber Lubrication – always a good choice

Owners and operators are constantly challenged to extract their target minerals or precious metals in the most cost-effective and reliable way and need to rely on the up to date knowledge, experience and expertise of specialists in the long-term care of their assets wherever that facility may be situated.

Internationally, Klüber Lubrication carry the endorsement of OEMs and operators alike especially on critical assets e.g. mill or kiln gear drives to not only assure their effective operation but also pushing back the boundaries of lubrication technology to bring state-of-the-art girth gear / pinion lubricants that dramatically reduce consumption (with spin-off benefits of reduced transportation costs, improved housekeeping, lower inventory levels, easy tooth flank inspection even during operation and lower disposal costs).

Reliability assurance is one thing but ease of maintenance at lower cost also adds value and so Klüber Lubrication offer a care programme (KlüberEfficiencySupport) primarily for large girth gear / pinion drives to help monitor system condition and thus provide plant engineers with trend data and an “early warning” of potential issues.

We use only trained and experienced lubrication engineers with IR, vibration, stroboscopy and analytical processes at their disposal. Your “healthcheck” is supported by a comprehensive report interpreted by specialists for any appropriate actions needed.

These same engineers offer a plant-wide service as required to also support the sustainability need or strategies of our customers, for example energy usage, CO_2 emissions, life cycle cost reductions etc. on all rotating equipment from general conveyors to air compressors and “workshop” products. Millions are spent every year on corrective and remedial engineering / maintenance actions that can be eliminated at source the proper consultation, which will often provide effective solutions that are yet simple to implement.

Service includes a running-in and repair service to increase the useful service life of girth gears and pinions by controlling and modifying tooth flank surface roughness, contact ratio, load distribution, removal of surface pittings and, ultimately, a tooth flank repair if possible.

KlüberEfficiencySupport

KlüberEnergy	KlüberMaintain	KlüberMonitor	KlüberRenew
Consulting service to improve the energy efficiency of your equipment including energy measurements for verification and reporting of energy / cost savings	Support for your lubrication management and maintenance programmes / TPM[1] considering the necessary lubrication maintenance tasks	Diagnostic analyses of used lubricants enabling improved machine operation and enhanced production output. High-quality recommendations with trend analyses and test rigs	Services to increase the lifetime of your cost-intensive components such as large gear drives and chains including appropriate training

KlüberCollege – Increasing people efficiency

1) Total Productive Maintenance

Lubricants for crushing equipment

Stationary equipment

We offer a wide range of high-quality products for the lubrication of plant equipment.

- Crushing equipment: We know how important it is to comply with production standards and meet the requirements of this type of machinery where shaft bearings are particularly under stress due to vibrations, shocks and possibly misalignment, all of which the lubricant has to compensate for.
- Electric motors: Special lubricants can contribute considerably to proper bearing operation, extended equipment lifetime, reliability and a reduction of noise. Furthermore, they permit higher speeds and provide resistance against external influencing factors.

For these applications, it is vital to bear in mind the bearing's speed factor. It is for this reason that Klüber Lubrication has developed alternative lubricants for these machines, featuring a wide range of different viscosities so that the speeds and loads of any machine can be handled.

Greases for crushing equipment

Application	Product	Composition	Solid Lubricant	Properties
Rolling bearings	Klüberplex BEM 41-141	Lithium complex, mineral oil	-	Very good wear and corrosion protection, general application, low temperatures. Speed factor 350,000
	Klüberlub BE 41-542	Special lithium, mineral oil	-	High load-carrying capacity and wear protection under extreme conditions Speed factor 500,000
	Klüberplex BE 31-502	Special calcium, mineral oil	-	Excellent protection against wear, corrosion, high temperatures and extreme humidity and high loads Speed factor 200,000
	Klüberlub BE 41-1501	Special lithium, mineral oil	MoS_2 + graphite	Excellent wear protection and resistance to extreme laods and low speeds. Speed factor 100,000
	Klüberlub BE 41-1002			
	Klüberlub BVH 71-461	Polyurea, mineral oil	-	Good wear protection, resistance to high temperatures and water and excellent pumpability especially for vibrating screens; approved by HAVER & BOECKER. Speed factor 200,000

Oils for crushers

Application	Product	Base oil	Operational temperature	Properties
Gears, Bushes, Plain bearings, Shafts, Rolling bearings	Klüberoil GEM 1N ISO VG 46 to 1000	Mineral	–15 to 100 °C 5 to 212 °F	Mineral oil, high scuffing load capacity, FZG ≥ 14, API GL4 - resistance to micropitting and medium temperatures
	Klübersynth GEM 4N ISO VG 32 to 680	Synthetic	–50 to 140 °C –58 to 284 °F	Synthetic oil based on PAO, miscible with mineral oil, high scuffing load capacity and resistance to low temperatures

Lubricants for process plant equipment

Large open gear drives

Our range of lubricants cover startup procedures, service or repair and are specially developed for large girth gear drives. They assure good adhesion, resistance to high load and protection against wear. The major OEMs of tube mills and rotary kilns for heavy industry, as well as the leading gear drive manufacturers, have included Klüber Lubrication in their lubrication charts.

These lubricants can be applied by spraying, enabling a reduction of consumption quantities by up to 50 % compared with the adhesive lubricants used so far. Where immersion or circulation lubrication is used, lube change intervals can be as long as 14,000 hours or even longer, depending on the operating conditions.

Lubricants for girth gear / pinion drives

Step	Product	Type	Application method	Properties / features
Priming	Klüberplex AG 11-462	White grease	Manual	Corrosion protection, load carrying for commissioning
Running In	Klüberfluid B-F2 Ultra	Clear fluid	Bath / sump or spray	Smoothen roughness of flank surface, increases load-carrying capacity
	GRAFLOSCON B-SG 00 Ultra	Black grease	Spray	
Operation	Klüberfluid C-F Ultra series	Clear fluid	Bath / sump or spray	High load-carrying capacity, excellent adhesion, maximum wear protection and scuffing load capacity
	GRAFLOSCON C-SG Ultra series	Black grease	Spray	
Repair	Klüberfluid D-F1 Ultra	Clear fluid	Spray	Repair of tooth flank damage and forced running in
	GRAFLOSCON D-SG 00 Ultra	Black grease	Spray	

Additional lubricant guide - mills

Application	Product	Type
Mill main drive (trunnion & pinion) bearings	Klüberoil GEM 1 N series	High-performance mineral oil
Gearboxes	Klübersynth GEM 4 N series	High-performance synthetic hydrocarbon oil
Inching motor bearings	STABURAGS N 12 MF	High load, high temperature bearing grease
Inching gearbox	Klübersynth GEM 4 N series	High performance synthetic hydrocarbon oil
Couplings	GRAFLOSCON C-SG 500 Plus	Extended life, high load grease
Brake thruster	Klüber Summit HySyn FG 15	Low viscosity, long-life synthetic oil
Trunnion bearing seal purge system	POLYLUB GA 352 P	Fortified sealing grease
Additional product selection		
Pinion, conveyor, electric motor bearings	Klüberplex BEM 41-132	High-performance long-life bearing grease
Chains – transport, drive	Klüberoil CM 1-220 Spray	High load carrying, long-term chain spray
Small open gears	GRAFLOSCON CA Ultra Spray	High load carrying, adhesive spray grease
Anti-seize, anti-fretting paste	Klüberbio EM 72-81	Rapidly biodegradable, no heavy metals
	ALTEMP Q NB 50	Water-resistant, no heavy metals
Penetrating, rust dissolving fluid	Klüberbio Z2-5	Rapidly biodegradable penetrating fluid
Acid plants with oxygen rich environment	AMBLYGON TA 15/2	Special grease for long-term lubrication and high temperatures
	Klüber Summit HySyn FR	Fire-resistant fluid
Air compressors (reciprocating, screw, vane)	Klüber Summit PS, SH, DSL, Supra Coolant – dependent on compressor type	High performance synthetic or semi-synthetic for oil injection, crankcases, cylinders

Lubricants for enclosed gearboxes

The KlüberComp Lube Technology concept combines all that is required for the needs of modern power transmission technology.

- Composition: Formulations for lubricants based on high-quality raw materials that are, for example, resistant to ageing, free of heavy metals and have a low tendency to form residues.
- Components: All lubricated components are taken into account, e.g. gear teeth, rolling bearings, radial shaft seals.
- Competitive: Maximum performance, standardised and application-related testing under extreme conditions.
- Competence: Consultation and tailored services, optimum product selection, wide range of lubricants, staff training.

Application	Product	Base oil	Operational temperature	Properties
Gears Rolling bearings Seals	Klüberoil GEM 1 N ISO VG 46 to 1000	Mineral	–15 to 100 °C 5 to 212 °F	Mineral oil with high scuffing load capacity, FZG ≥ 14, API GL4 - resistance to micropitting and medium temperatures
	Klübersynth GEM 2 ISO VG 220, 320	Synthetic	–30 to 130 °C –22 to 266 °F	BIODEGRADABLE synthetic oil based on ester; excellent wear protection, resistance to micropitting and high temperatures
	Klübersynth GEM 4 N ISO VG 32 to 680	Synthetic	–50 to 140 °C –58 to 284 °C	Synthetic oil based on PAO; high scuffing load capacity FZG ≥ 14, resistance to micropitting, temperatures and extreme loads
	Klübersynth GH 6 ISO VG 22 to 1500	Synthetic	–55 to 160 °C –67 to 320 °F	Synthetic oil based on polyglycol; high scuffing load capacity FZG ≥ 14, API GL 5, resistance to micropitting, extreme temperatures, loads

Today, there are five specific requirements that are considered paramount when it comes to the lubrication of enclosed gear components:

- Scuffing load – determined in FZG scuffing load test
- Micropitting – determined in FVA micropitting test
- Rolling bearing life – determined in FAG FE 8 wear and service life test
- Wear behaviour in spur gears – determined according to DGMK slow speed wear test
- Premature failure of radial shaft seals – compatibility with elastomers in dynamic uses tested by Freudenberg

Our most recent development and testing activities have been focused on gear oils Klüberoil GEM 1 N, Klübersynth GEM 2, GEM 4 N and GH 6; these products have proven to be ideally suited for the requirements of both manufacturers and operators of such gears.

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It constitutes neither an assurance of product properties nor does it release the user from the obligation of performing preliminary field tests with the product selected for a specific application. All data are guide values which depend on the lubricant's composition, the intended use and the application method. The technical values of lubricants change depending on the mechanical, dynamical, chemical and thermal loads, time and pressure. These changes may affect the function of a component. We recommend contacting us to discuss your specific application. If possible we will be pleased to provide a sample for testing on request. Products from Klüber Lubrication are continually improved. Therefore, Klüber Lubrication reserves the right to change all the technical data in this document at any time without notice.

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Klüber Lubrication – your global specialist

Innovative tribological solutions are our passion. Through personal contact and consultation, we help our customers to be successful worldwide, in all industries and markets. With our ambitious technical concepts and experienced, competent staff we have been fulfilling increasingly demanding requirements by manufacturing efficient high-performance lubricants for more than 80 years.

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