

Lubricants for Surface Mining



LUBRICANTS.
TECHNOLOGY.
PEOPLE.



LUBRICANTS. TECHNOLOGY. PEOPLE.



- **Global Expertise - Local Supply Solutions:**
31 Plants and 10,000 products for over 100,000 customers worldwide.
- **More than 350 people in R&D worldwide are dedicated to Technological Leadership.**
- **Technological Leadership in Lubricants, Applications & Processes.**
- **First-Fill competence for automotive and industrial applications.**



Numbers and facts

FUCHS PETROLUB SE

WORLDWIDE LARGEST INDEPENDENT MANUFACTURER OF LUBRICANTS

EMPLOYEES: OVER 3,700

SUBSIDIARIES: 49

For more than 80 years, we have been concentrating all our activities and research efforts on the development of innovative lubricants. This specialisation means that we are enjoying continuous growth – geographically, technically and in the number of application areas.

Today, FUCHS is a company that offers powerful lubricants and associated specialties worldwide in practically all areas of application and industries.

FUCHS EUROPE SCHMIERSTOFFE GMBH

PLANT: Mannheim and Kiel

HOLDING: FUCHS PETROLUB SE

HEADQUARTERS: Mannheim

TRUE LUBRICANT SPECIALIST: 100 % focus on lubricants

FULL LINE OF PRODUCTS:
More than 2,000 products and 6,000 product-pack combinations

CERTIFIED BY: DIN EN ISO 9001:2008, ISO/TS 16949:2009, DIN EN ISO 14001:2004, BS OHSAS 18001:2007, KTA 1401

What makes our products more valuable: We develop lubricants on an application specific basis and tailored to our partners' processes. Together, we look for the best lubricant for our customers. This type of collaboration is unique in its form, scope and intensity.

We call it a development partnership. This ability is based on one key feature: As a true lubricant specialist with our headquarters in Mannheim/Germany, we are the largest independent lubricant specialist, and this independence makes all the difference. We are open to new methods and visionary approaches – a prerequisite for innovations. And innovations are a FUCHS trademark.

TECHNOLOGY DRIVEN LUBRICANTS THAT KEEP MINING EQUIPMENT RUNNING STRONGER AND LONGER



- Commitment to technical excellence in lubricants for extreme duty mining applications.
- Full range of lubricants for surface and underground applications.
- Continuous product development and optimisation to better serve your mining needs.
- Xtreme Temperature Lubrication Technology offers unique benefits for extremely hot and cold environments.
- Associated with the global mining industry for more than 100 years.

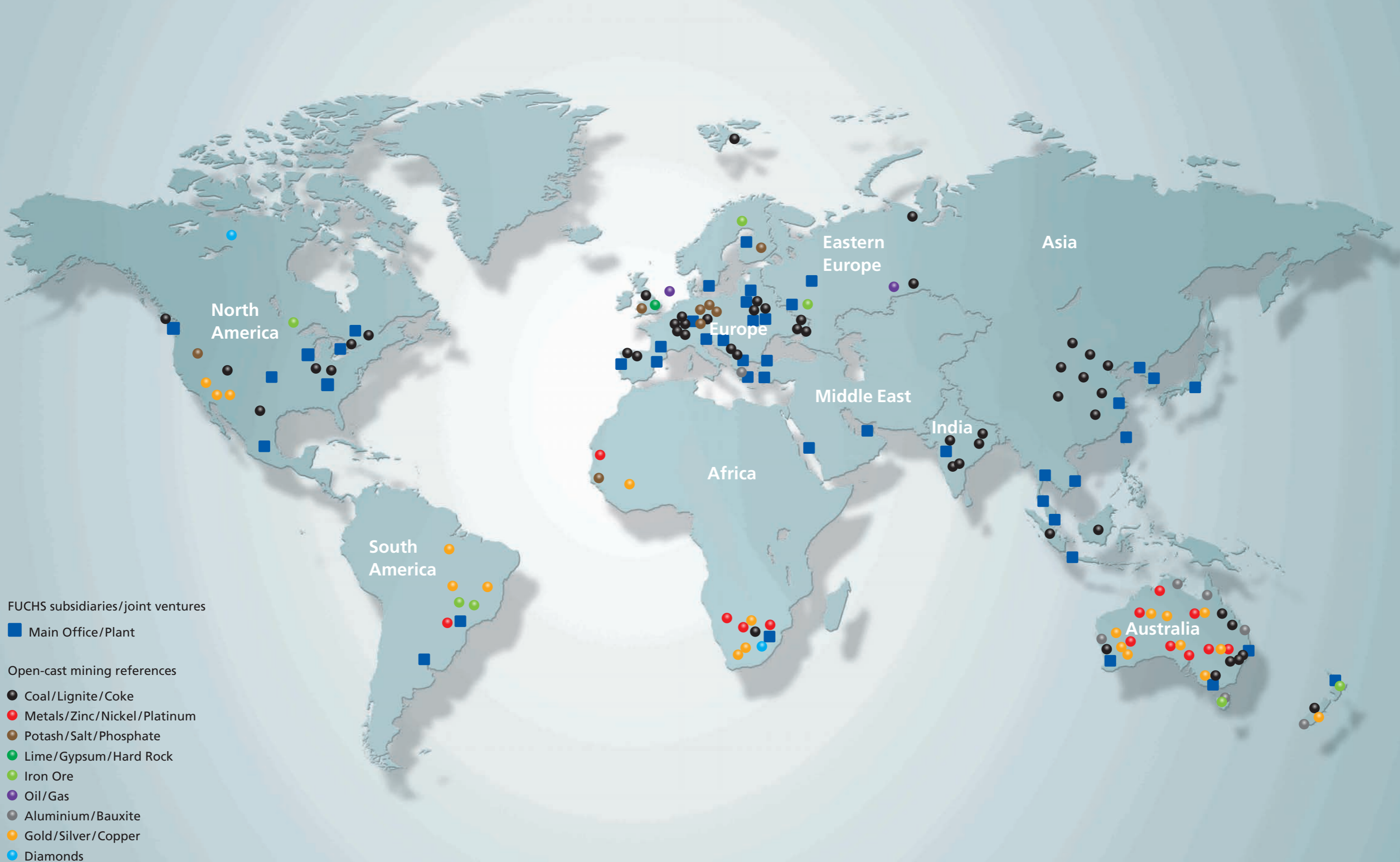
Technology driven lubricants developed by dedicated professionals are our CORE business

As part of our commitment to technical excellence we continually develop new products and optimise existing products to better serve your mining needs.

Maintenance costs and breakdowns are reduced and maximised up-time allows productivity increases and maximum value from your equipment.

FUCHS is uniquely qualified to be a true global partner, with a focus on globally controlled, company owned, local manufacturing and distribution coupled with a global support network to meet your specific mining needs.

STRATEGICALLY LOCATED AROUND THE GLOBE, FUCHS HAS SURFACE MINING COVERED





Product overview Mining Lubricants



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1. ENGINE OILS

Hard-working engines in the mining industry require the very best in heavy duty engine oil technology. Constantly running at high loads places extreme demands on the oil to ensure that engines run reliably and components are protected to provide maximum life span. FUCHS is a leader in engine oils, with continuous improvement for top performance.

But it is not only reliability and innovation that count but what they provide. TITAN high performance engine oils ensure that operating costs are cut by reducing fuel and oil consumption and because they facilitate longer oil change intervals.

FUCHS. Your reliability and innovation partners. You can rely on us.



REFERENCES

TITAN CARGO SAE 15W-40

TITAN CARGO SAE 15W-40 was developed for use in the latest off highway mining equipment entering the market, with its advanced formulation it allowed for significantly extended drain intervals and a safety margin that other products could not offer.

- The drain intervals that were offered by other products was only 250 hours and with the introduction of this product the drain intervals were increased systematically to 500 hours. We have some applications where the oil was not drained until over 600 hours and the oil showed no signs of fatigue.
- The product was proven to provide an extremely low rate of oil consumption vs products previously used.
- In special circumstances the oil has provided reliable protection and performance for up to 1000 hour drain intervals.

1. ENGINE OILS



TITAN

Heavy duty diesel engine oils		Specifications	Approvals	FUCHS recommendations
TITAN CARGO MAXX SAE 10W-40 PREMIUM* LOW SAPS	Premium MAXX Performance Engine Oil. Specially developed for vehicles with modern exhaust after treatment and turbocharger. Good cold starting properties and ageing stability for fueleconomy over the whole drain-interval.	ACEA E9/E7/E6 API CI-4 CATERPILLAR ECF-1a JASO DH-2	DEUTZ DQC IV-10 LA MACK EO-M PLUS MACK EO-N MAN M 3271-1 MAN M 3477 MB-APPROVAL 228.51 MB-APPROVAL 235.28 MTU DDC TYPE 3.1 RENAULT RXD/RGD/RLD-2 SCANIA LA VOITH-RETARDER 'B' VOLVO VDS-3 / CNG	CUMMINS CES 20077 DAF MAN M 3277 CRT
TITAN CARGO SAE 15W-40	Ultra High Performance, fuel-economy engine oil for a variety of commercial vehicle diesel engines. Specially developed for Volvo with extended service intervals, exhaust after treatment and turbocharger.	ACEA E9/E7 API CJ-4/CI-4 PLUS/CI-4 CAT ECF-2/ECF-3	CUMMINS CES 20081 DEUTZ DQC III-10 LA DETROIT DIESEL DDC 93K218 FAWDE Q/XC 3135-2007 MACK EO-0 PREMIUM PLUS MAN M 3575 / 3275-1 MB-APPROVAL 228.31 MTU DDC TYPE 2.1 RENAULT RLD-3 VOLVO VDS-4	ALLISON C-4
TITAN CARGO MC SAE 10W-40	Ultra High Performance, fuel-economy engine oil based on MC-synthesis for a variety of commercial vehicle diesel engines. Specially developed for extended service intervals. Good cold starting and lower oil consumption.	ACEA E7/E4 API CI-4	CUMMINS CES 20077/8 DEUTZ DQC III-10 MACK EO-M PLUS MACK EO-N MAN M 3277 MB-FREIGABE 228.5/ MB-APPROVAL 228.5 MTU DDC TYPE-3 RENAULT RXD / RLD-2 SCANIA LDF-2 VOLVO VDS-3	DAF IVECO 18-1804 SDFG OM-1901A
TITAN TRUCK PLUS SAE 15W-40	Super High Performance engine oil for a variety of diesel and gasoline engines. Specially for highly-loaded commercial vehicle diesel engines. Lower oil consumption.	ACEA E7 API CI-4 / SL	CUMMINS CES 20076/7/8 DEUTZ DQC III-10 MACK EO-N MAN M 3275-1 MB-APPROVAL 228.3 MTU DDC TYPE-2 RENAULT RLD / RLD-2 VOLVO VDS-3	ACEA A3/B4 ALLISON C-4 CAT TO-2 CASE MS 1121 CUMMINS CES 20071/2 DAF IVECO 18-1804 CLASSE T2 E7 NH 330 H STEYR A-201
TITAN UNIVERSAL HD SAE 30	High Performance monograde engine oil for gasoline and diesel engines. Specially developed for off-road vehicles. Depending upon manufacturer regulation also applicable in other aggregates.	ACEA E2 API CF-4/SG	DEUTZ DQC I-02 MAN 270 MB-APPROVAL 228.2 MTU DDC TYPE-2 ZF TE-ML 04B	MIL-L-2104 D ALLISON C-4 CAT TO-2 ZF TE-ML 02C

1. ENGINE OILS



TITAN

Heavy duty diesel engine oils		Specifications	Approvals	FUCHS recommendations
TITAN UNIVERSAL HD SAE 40	High Performance monograde engine oil for gasoline and diesel engines. Specially developed for off-road vehicles. Depending upon manufacturer regulation also applicable in other aggregates.	ACEA E2 API CF-4/SG	DEUTZ DQC I-02 MAN 270 MB-APPROVAL 228.2 MB-APPROVAL 235.12 MTU DDC TYPE-2 ZF TE-ML 04B	API CF-2 MIL-L-2104 D ALLISON C-4 CAT TO-2 ZF TE-ML 02C
TITAN UNIVERSAL HD SAE 50	High Performance monograde engine oil for gasoline and diesel engines. Specially developed for off-road vehicles. Depending upon manufacturer regulation also applicable in other aggregates.	ACEA E2 API CF-4/SG	DEUTZ DQC I-02 MAN M 3275-2 MB-APPROVAL 228.0	MIL-L-2104 D ALLISON C-4 CAT TO-2 ZF TE-ML 02C

Heavy duty diesel engine oils arctic and low viscosity		Specifications	Approvals	FUCHS recommendations
TITAN UNIVERSAL HD SAE 10W	High Performance Monograde Engine Oil for gasoline and diesel engines. Specially developed for off-road vehicles. Depending upon manufacturer regulation also applicable in other aggregates.	ACEA E2 API CF-4/SG	MAN 270 MB-APPROVAL 228.0 ZF TE-ML 03B	MIL-L-2104 D ALLISON C-4 CAT TO-2 ZF TE-ML 02C

*SAPS = Sulfated Ash, Phosphorous and Sulfur

2. GEAR OILS

The mining industry presents special demands and implications for driveline and enclosed gear applications. High load with rapid intermittent shock loading, always running, often reversing, these are highly stressed and critical components. Virtually every design type for the transmission of power is used in the diverse fleet of equipment used in surface mining.

There is a FUCHS grade for nearly every type of gearbox or transmission application in the surface mining industry e.g., heavy-duty manual and powershift transmissions; hoist, drag, propel and swing gearcases; final drives and axles.

These FUCHS oils were developed especially for the most advanced gearboxes and transmission designs. These high performance gear and transmission oils meet the highest standards and specifications and ensure reliable, continuous operation for low wear and low frictional loss.

This is a result of the development partnerships between FUCHS and the world's leading gearbox manufacturers. With the synthetic gear oils FUCHS uses special additive technologies and highly developed base oils. With their outstanding performance they can be used for almost any gearbox, particularly under extreme conditions.

The benefits are: outstanding low temperature properties and easy gear changing, the lowest possible degree of wear and tear and therefore the longest service life, extremely high pressure resistance and offering great reliability plus optimal corrosion protection.

Insist on quality and reliability. Insist on FUCHS.



2. GEAR OILS



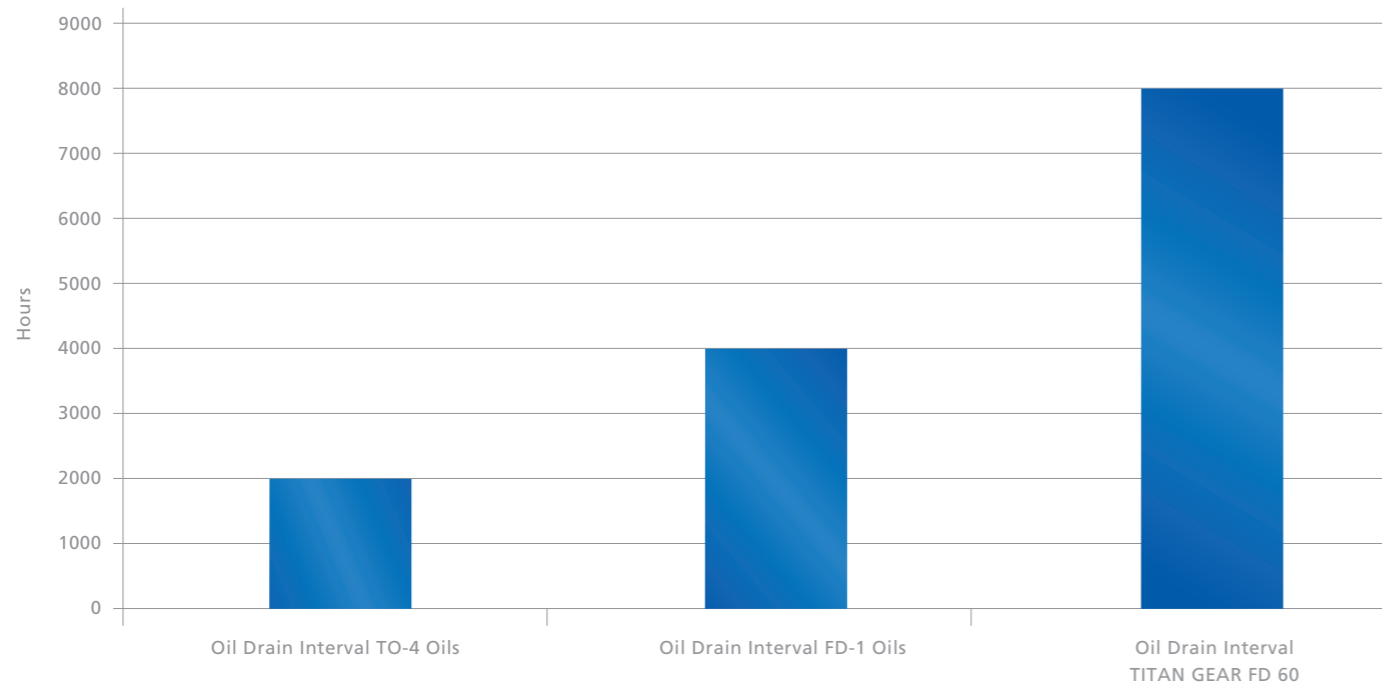
REFERENCES

TITAN GEAR FD 60

TITAN GEAR FD 60 was designed for use where the specification FD-1 is called for, it was developed and tested in close co-operation between the FUCHS driveline specialists and with various major mining houses in Australia to meet and exceed the requirements of Caterpillar.

- With the introduction of the new 795 CAT trucks into the market that did not have wet brakes, it was decided to change from a standard TO-4 SAE 60 oil to a dedicated final drive oil, with capabilities to double the oil drain interval and to lower wear rates
- The change to the new TITAN GEAR FD 60 allowed the oil drain intervals to be moved from 2000 hours to in excess of 4000 hours
- In some instances TITAN GEAR FD 60 oil drain intervals have been extended to 8000 hours
- Benefits include
 - o Reduced maintenance costs
 - o Increase equipment availability
 - o Lower waste disposal costs

Oil Hours



2. GEAR OILS



TITAN

Automotive gear and final drive oils	Specifications	Approvals	FUCHS recommendations
TITAN SUPERGEAR MC SAE 80W-90	High Performance gear oil.	API GL-4/GL-5	
TITAN SUPERGEAR SAE 85W-140	High Performance gear oil for extended oil change intervals.	API GL-4/GL-5	ZF TE-ML 05A, 12E, 16D
TITAN GEAR FD SAE 50	Specialty final drive and axle oil, designed to meet CAT Specification FD-1. A SAE viscosity grade 50 final drive and axle oil. Also suitable for use in Allison transmissions for on-road and off-highway applications where a C4 specification is required.	CATERPILLAR FD-1	
TITAN GEAR FD SAE 60	Specialty final drive and axle oil, designed to meet CAT Specification FD-1. A SAE viscosity grade 60 final drive and axle oil. Also suitable for use in Allison transmissions for on-road and off-highway applications where a C4 specification is required.	CATERPILLAR FD-1	
TITAN GEAR LS SAE 90	High Performance LS (Limited Slip) hypoid gear oil for axles in commercial vehicles and passenger cars with or without limited slip differentials.	API GL-5	ZF TE-ML 05C, 12C, 16E, 21C MIL-L-2105 D FORD M2C104-A JOHN DEERE JDM J 11 F LIEBHERR NH 520 B

Automotive gear oils arctic	Specifications	Approvals	FUCHS recommendations
TITAN CYTRAC SL SAE 75W-90	Premium Performance Gear Oil for highly stressed hypoid axles in commercial vehicles formulated with fully-synthetic base oils. Developed for the longest oil change intervals in commercial vehicle axle drives.	API GL-5 SCANIA STO 1:0	MAN 342 TYPE S1 JOHN DEERE JDM J 11 E/G MB 235.8 VOLVO 97312 ZF TE-ML 05B, 07, 08, 12B, 16F, 17B
TITAN CYTRAC HSY SAE 75W-90	Ultra High Performance Gear Oil for commercial vehicle manual transmissions and axle drives formulated with fully synthetic base oils.	API GL-4/GL-5	ZF TE-ML 05B, 12B, 16F, 17B, 19C, 21B DAF MAN M 3343 TYPE S JOHN DEERE JDM J 11 E/G SCANIA STO 1:0 ZF TE-ML 07

2. GEAR OILS



SPECIALITIES

Premium industrial gear oil		Specifications	Approvals	FUCHS recommendations
RENOLIN UNISYN CLP-SERIES	Designed for use in industrial gearboxes and general lubrication systems subject to high temperatures. Fully synthetic lubricants based on polyalphaolefins. RENOLIN UNISYN CLP oils lower friction and reduce wear. Furthermore, these oils increase the efficiency of machine components.	DIN 51 517-3: CLP ISO 6743-6 and ISO 12925-1: CKC/CKD/CKE AGMA 9005/E02: EP AIST 224 David Brown S1 53.101 FAG requirements: FAG-FE8 Test: stage 1-4 pass (test report is available for ISO VG 320) SKF requirements: pass (100°C-test) ISO VG 68/100/150/220/320/460/680/1000	A. Friedrich Flender AG Bocholt Bucyrus SD4720 enclosed gear lubricant electric rope shovels Bucyrus SD4721 Part B enclosed gear lubricant draglines Bucyrus SD4722 enclosed gear lubricant rotary blasthole drills	
PLANTOGEAR S-SERIES	Rapidly biodegradable, environmentally friendly high performance gear oils based on saturated synthetic esters. Excellent tribological properties. Exceed the requirements of CLP-E according to ISO 12925-1:CKC,CKD, CKE. Approved by well-known gear manufacturers. Awarded the European environmental seal.	ISO VG 100/150/220/320/460/680		
RENOLIN CLP PLUS-SERIES	Proven, special mineral oil-based gear oils. Friction-reducing and detergent. Outstanding ageing stability. Good protection against micro-pitting. Extended oil change intervals are possible. Approved by well known gear manufacturers, ISO 12925-1:CKC, CKD.	ISO VG 68/100/150/220/320/460/680	Bucyrus SD4720 enclosed gear lubricant electric rope shovels Bucyrus SD4721 Part B enclosed gear lubricant draglines Bucyrus SD4722 enclosed gear lubricant rotary blasthole drills	

2. GEAR OILS



SPECIALITIES

Industrial gear oil		Specifications	Approvals	FUCHS recommendations
RENOLIN CLP-SERIES	Contain carefully selected base oil and matched additives to protect machinery from undue wear in especially critical boundary friction conditions. Fulfill and in many cases exceed all CLP lubricating oil requirements as defined in DIN 51 517-3 and ISO 6743-6.	DIN 51 517-3:CLP ISO 6743-6:CKC US Steel 224 AGMA 250.04 FZG A/8,3/90: load stage >12, DIN 51 354-2 FZG A/16,6/140: load stage >12, DIN 51 354-2 FZG C/8,3/90: load stage 10, FVA* No.54/I-IV ISO VG 68/100/150/220/320/460/680	FLENDER, Germany SEW, Germany and other significant gear manufacturers	

Wheel motor gear oil		Specifications	Approvals	FUCHS recommendations
GEARMASTER SYN 680	Fully formulated synthetic lubricant with highly effective anti-wear and extreme pressure additive packages. Exceeds AGMA EP specifications for industrial gearboxes and is approved for use in wheel motor gear units where GE specification D50E27E is required. The carefully selected blend of base oils ensures compatibility with seals and gasket materials. High viscosity index and superior resistance to thermal breakdown allow service at operating temperatures of up to 270°C.	ISO VG 220/320/460/680	GE approved for electric wheel motors. GE specification D50E27E	

3. TRANSMISSION OILS



TITAN

Transmission oils	Specifications	Approvals	FUCHS recommendations
TITAN ATF 6000 SL	Premium Performance ATF offering maximum performance in passenger car applications such as automatic transmissions with torque converters or wet clutches as well as power steering systems. Formulation is licensed according to DEXRON VI and downwards compatible to any former DEXRON-specification.	DEXRON VI VOITH H55.6335.xx ZF TE-ML 09	
TITAN ATF 5005	Premium Performance ATF for automatic transmission in motor vehicles. Outstanding base oil quality for optimal cold temperature properties and high ageing stability. Durable friction properties for excellent wet clutch performance.	MAN 339 TYPE V2 MAN 339 TYPE Z2 MB-APPROVAL 236.6 VOITH H55.6336.XX ZF TE-ML 04D, 14B, 16L, 17C	DEXRON III (H) ALLISON TES 295 ALLISON TES 389 FORD MERCON V MAN 339 TYPE Z3 VOLVO 97341 ZF TE-ML 02F, 11B, 14C
TITAN ATF 4000	Ultra High Performance ATF for use in automatic transmissions as well as other ATF applications. Licensed according to DEXRON III (H). Improved low-temperature shifting compared to DEXRON II.	ALLISON C-4 ALLISON TES-389 DEXRON III (H) MAN 339 TYPE V1 MAN 339 TYPE Z1 MB-APPROVAL 236.1 MB-APPROVAL 236.9 VOITH H55.6335.XX VOLVO 97341 ZF TE-ML 04D, 14A, 17C	CAT TO-2 FORD MERCON ZF TE-ML 09, 11B
TITAN RENOFLUID 3000S	Multifunctional ATF for automatic and powershift transmissions as well as power steering systems requiring DEXRON II (D).	MB-APPROVAL 236.1 ZF TE-ML 09, 11, 14A	DEXRON II (D) FORD MERCON ALLISON C-4 CAT TO-2 VOITH

3. TRANSMISSION OILS



TITAN

Multifunctional Transmission Oils	Specifications	Approvals	FUCHS recommendations
TITAN UTTO PRO	Ultra High Performance multifunctional oil for gears, axles and hydraulic systems with improved wear protection and wide range of application temperatures.	API GL-4 SAE J 306: 75W-80	VOLVO WB 101 ALLISON C-4 CASE MS 1207/ 1209/1210 FORD M2C86-C FORD M2C134-D JOHN DEERE JDM J 20 C/D KOMATSU AXO 80 (KES 07.866) KUBOTA UDT FLUID MASSEY FERGUSON CMS 1135 / 1143 VOLVO WB 102 ZF TE-ML 03E, 03F, 05F, 06K
TITAN UTTO TO-4 SAE 10W	Super High Performance multifunctional lubricant for hydraulics in construction machinery.	API GL-4 CAT TO-4 KOMATSU KES 07.868.1	ALLISON C-4 DANA EATON
TITAN UTTO TO-4 SAE 30	Super High Performance multifunctional transmission lubricant for construction machinery.	API GL-4 CAT TO-4 KOMATSU KES 07.868.1	ZF TE-ML 03C ALLISON C-4 ALLISON TES-439 DANA EATON ZF TE-ML 07F
TITAN UTTO TO-4 SAE 50	Super High Performance multifunctional lubricant for final drives in construction machinery.	API GL-4 CAT TO-4 KOMATSU KES 07.868.1	DANA EATON
TITAN UTTO ZF	Super High Performance Gear Oil for ZF axles with limited-slip differentials. Recommended for construction machinery and material-handling vehicles axles.		ZF TE-ML 05F, 06K, 17E, 21F JOHN DEERE JDM J 14 A/C KOMATSU-HANOMAG VOLVO WB 101 ZF TE-ML 03E

4. HYDRAULIC OILS

In many surface mining operations hydraulic excavators are taking on a greatly expanded role. The demands on these machines are increasing as is their importance to the efficiency and productivity of the mine. In turn the hydraulic oil is a crucial contributor to the efficiency and productivity of the excavator.

The hydraulic systems are always running at high load and often operate at full capacity (low tank volume, high circulation rates, high pressure) and potentially in very hot or very cold environments. In other words, today's hydraulic oils are a more critical component than ever. Standard hydraulic oils cannot reliably meet the requirements placed upon them in all instances.

Therefore FUCHS offers a full range of hydraulic oils to meet the specific requirements of our customers operations. From premium performance mineral oils to special synthetics we have your hydraulic oil needs covered.

The demand for lower fuel consumption and the associated reduction of emissions, while maintaining the same level of performance, can now only be met by using special hydraulic oils. Fuel economy and energy saving are becoming more and more important. In the light of this, and in order to meet the special demands of a heavy machinery manufacturer, we have developed specialty hydraulic oil that significantly reduces fuel consumption while at the same time offering high efficiency and longer service life. Less maintenance and lower failure related downtime as well as a broader operating temperature range make a significant reduction in operating costs.

You can benefit from our experience too!



4. HYDRAULIC OILS



REFERENCES

RENOLIN XtremeTemp

Today, hydraulic systems, and in particular construction machinery and material handlers, often operate at full capacity (low tank volume, high circulation rates, high pressure, highest specific oil levels).

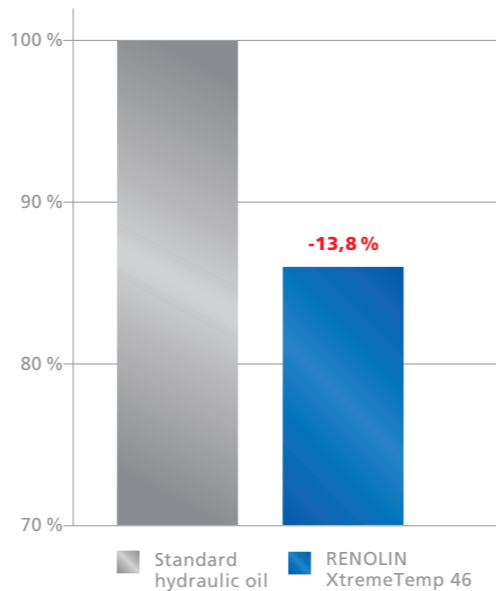
In other words, today's hydraulic oils can often no longer reliably meet the requirements placed upon them. The demand for lower fuel consumption and the associated reduction of CO₂ emissions while maintaining the same level of performance can now only be met by using special hydraulic oils such as RENOLIN XtremeTemp.

RENOLIN XtremeTemp sustainably reduces your operating costs

Alongside a number of other tests, nine days of field tests lasting several hours were carried out with a shovel excavator in which the machine was unloaded at 180° from a distance of 30 meters. This work cycle was constantly repeated. RENOLIN XtremeTemp 46 was compared with conventional hydraulic oil for this application.

Field test: At full load, the fuel consumption of the excavator was 20 litres per hour using conventional hydraulic oil. With RENOLIN XtremeTemp this figure dropped to just 17 litres per hour – a significant reduction.

Significantly reduced fuel consumption



Specific results of the field tests can be requested.

Work efficiently with RENOLIN XtremeTemp

When used in a track excavator for over 4000 working hours with a hydraulic system volume of 255 litres, it quickly became apparent that the higher price of RENOLIN XtremeTemp 46 is outweighed by numerous advantages:

- 12% increase in productivity: By using RENOLIN XtremeTemp it was possible to move more earth during the same period, or the time required to move the same amount of earth was reduced.
- Fuel required for excavator reduced by 12,680 litres: With consumption of 80,017 litres of fuel compared to 92,696 litres when using a conventional hydraulic oil, RENOLIN XtremeTemp brought about a noticeable reduction in fuel costs.

4. HYDRAULIC OILS



RENOLIN

Hydraulic oils		Specifications	Approvals	FUCHS recommendations
RENOLIN B-SERIES	Lubricating and hydraulic oils with additives to improve ageing resistance, corrosion and wear protection, demulsifying.	HLP hydraulic oils according to DIN 51524-2, ISO 11158-HM ISO VG 10/22/32/46/68/160		
RENOLIN B HVI-SERIES	High performance AW/EP hydraulic and general lubricating oils with a high viscosity index (VI). Contains additives to improve ageing resistance, corrosion protection and wear protection.	Mineral oil-base and containing zinc, RENOLIN B-HVI oils are HVLP hydraulic and general lubricating oils according to DIN 51 524-3 ISO VG 15/32/46/68		
RENOLIN HO	Zinc- and ash-free hydraulic and circulating oils of the latest generation providing excellent ageing resistance, high corrosion protection, demulsifying.	Fulfils and surpasses the specs according to DIN 51524-2 HLP, ISO VG 15/32/46/68 100/150		

Premium hydraulic oils		Specifications	Approvals	FUCHS recommendations
RENOLIN UNISYN OL	Fully synthetic hydraulic oils based on polyalphaolefines with very good ageing stability, wear protection, good demulsifying properties and viscosity temperature behavior, high VI and excellent air release properties.	The products of the RENOLIN UNISYN OL series fulfil the requirements for hydraulic oils HVLP DIN 51524-3		
RENOLIN XTREME TEMP-SERIES	Special hydraulic oil for low start-up temperatures and wide temperature range based on special semi-synthetic base oils and state-of-the-art additive technology. Excellent shear stability.	HVLP hydraulic oils according to DIN 51524-3, ISO 11158-HV ISO VG 32/46		
RENOLIN XTREME TEMP PLUS-SERIES	Special hydraulic oil for low start-up temperatures and wide temperature range based on special semi-synthetic base oils and state-of-the-art additive technology. Excellent shear stability.	HVLP hydraulic oils according to DIN 51524-3, ISO 11158-HV with additional additives to avoid stick-slip. ISO VG 32/46		
RENOSAFE WG SERIES	Water glycol based, fire-resistant hydraulic fluids with excellent anti-wear and corrosion inhibitor properties. Provides highest thermal and oxidative stability.	Fire-resistant hydraulic fluid type HFC according to ISO 6743 and ISO VG 32/46.		

5. GREASES

The importance of choosing the right lubricating grease or multi-service open gear lubricant must never be underestimated. These lubricants are integral components of heavy machinery, particularly for surface mining applications. Bearings, both plain pin & bush type and rolling element type, and massive open gears are constantly subjected to extremely high load and shock load conditions, constant reversing and oscillating motion, and operating in the most severe environmental conditions. Subjected to prolonged and continuous exposure to a combination of dust and dirt, water, process minerals contamination and extremes of hot and cold ambient operating temperatures this class of lubricants is critical to the protection of your entire surface mining fleet.

RENOLIT CXS GSM greases and RENOLIT CENTAK OG multi-service open gear lubricants were specifically developed to provide coverage for the broadest range of OEM applications and specifications without compromising performance and protection. This allows consolidation to the minimum number of products while ensuring the most complete and comprehensive protection for even the most extensive mixture of equipment makes and models.

To ensure everything runs smoothly. Ensure your investment with FUCHS!



5. GREASES



REFERENCES

RENOLIT CXS GSM Range

The range of RENOLIT CXS GSM greases was developed to allow for a reduction in the number of greases used on site whilst offering no performance reduction vs the OEM recommended products. With the successful trial of a summer and desert versions in Australia the product has proven to be a reliable performer.

- Ability to rationalise products across a wide variety of OEM's
- Ability to provide emergency running lubrication
- An optimised formulation allows for the highest level of wear protection
- No lubricant related failures have occurred since the introduction of these products
- Acceptance by all major mining OEM's
- Excellent pumpability in real world applications

Testimonial

To whom it may concern,

"Nearly two years ago we upgraded our FUCHS lubricant to RENOLIT CXS GSM and to date it is performing as expected and we have not seen any issues. For us one of the key inputs from the FUCHS team was the research and information that they brought to use from the OEM to say that it was acceptable. We had a small hurdle with one OEM but again the team from FUCHS aligned with them and we got a final sign off; I believe this has been a win/win for all involved."

Maintenance Superintendent, Open Cut Coal Mine in the Hunter Valley Australia

RENOLIT CENTAK OG/S

RENOLIT CENTAK OG/S was developed to meet the demanding applications of draglines and electric rope shovels, it has the ability to allow for a significant reduction in product usage whilst providing the highest level of wear protection. Its innovative technology has also proven to be highly suitable for wire ropes and in field trials has enabled an extension of wire rope life in excess of 25%.

- Excellent pumpability in real world applications
- Reduced lubricant consumption and waste
- Excellent protection for wire ropes as it initially penetrates and then forms a protective barrier on the wire rope to prevent the ingress of contamination
- Does not attract dust
- A black transparent film to allow easy inspection of gears
- Water resistant

5. GREASES



RENOLIT

Heavy duty grease		Specifications	Approvals	FUCHS recommendations
RENOLIT HD 2 SA	Heavy duty grease designed for slow moving bearings, Pins & Bushes as well as certain gears that are subjected to high and/or shock loads. 5% moly, tacky and fantastic pump ability. USS Mobility @ -5°C = 16 g/min			
RENOLIT G-WG 2	Heavy duty grease based on synthetic fluids and an inorganic thickener to give it extreme high temperature capabilities. Formulated primarily for scraper winch gearboxes and many other high heat/load applications.			

High load applications		Specifications	Approvals	FUCHS recommendations
RENOLIT MOLY LX 2	Multi-purpose lubricating grease fortified with Molybdenum Disulphide using a Lithium complex as its base. It contains extreme pressure, corrosion and antirust inhibitors & polymers.			

Open gear grease		Specifications	Approvals	FUCHS recommendations
CEPLATTYN KG 10 HMF-1000	Spray able, high-alloyed, graphite containing adhesive lubricant for Open Gears, free of heavy metal and chlorine. Based on a high-viscosity base oil mixture with aluminium-complex soap as a thickener. CEPLATTYN KG 10 HMF-1000 together with CEPLATTYN RN (running in) and CEPLATTYN 300 (priming) represent the balanced system of the FUCHS LUBRITECH multi-phase lubrication.		Babcock David Brown Ferry Capitain Gebr. Pfeiffer KHD Krupp Fördertechnik Polysius F. L. Smidth	

A complete range of FUCHS LUBRITECH greases are available. Please contact us for more information.

5. GREASES



RENOLIT

Solid containing grease		Specifications	Approvals	FUCHS recommendations
RENOLIT CXS GSM SERIES	High-performance calcium sulfonate complex thickened grease formulated with 100% virgin base oils, an optimised extreme pressure/anti-wear additive system, corrosion/oxidation additive package and fortified with a synergistic solids additive system for maximum protection in heavily loaded/shock loaded applications. This blend of solid additives provides for improved performance over straight 5% Molybdenum Disulfide (MoS ₂) grease alone. Reference Product Information sheet for more details on individual grades.			Bucyrus SD4711 Caterpillar Bucyrus HEX (Terex-O&K) P&H 472 Komatsu Liebherr Hitachi LeTourneau

Multipurpose grease		Specifications	Approvals	FUCHS recommendations
RENOLIT LC-WP1 & LC-WP2	Waterproof, multipurpose EP Lithium/Calcium greases, highly fortified with synthetic polymers.			
SUPER LUPLEX M2 & M3	Non-lead Lithium complex extreme pressure greases primarily developed as wheel bearing and chassis greases but equally suitable for all types of vehicle, electric motor bearings and couplings.			

Open gear grease		Specifications	Approvals	FUCHS recommendations
RENOLIT CENTAK OG SERIES	High performance multi-service lubricant designed for use on open gears and highly loaded components in severe duty mining applications. Fortified with high viscosity base oils, select polymers and lubricating solids, along with chemical anti-wear (AW) and extreme pressure (EP) additives it rapidly establishes a tenacious lubricant film. Protection of gear teeth, bearing surfaces and other components is maintained even when subject to extreme operational and environmental conditions. Superior film retention and adhesion to the components allows for extended lubrication intervals. Reference Product Information sheet for more details on individual grades.			Meets or Exceeds Key Performance Requirements of Bucyrus SD4713, P&H 464 and P&H 520 Multi-Service Lubricant for use on Shovels and Draglines

5. GREASES



RENOLIT

Wire rope greases		Specifications	Approvals	FUCHS recommendations
RENOLIT CENTAK OG/S	RENOLIT CENTAK OG/S was developed to meet the demanding applications of draglines and electric rope shovels, it has the ability to allow for a significant reduction in product usage whilst providing the highest level of wear protection. Its innovative technology has also proven to be highly suitable for wire ropes and in field trials has enabled an extension of wire rope life in excess of 25%.			


Rope Dressings		Specifications	Approvals	FUCHS recommendations
NOXAL ROPE DRESSING 8 SUPER	A solid type wire rope dressing manufactured from a mixture of selected mineral oils, bitumen and additives, and are suitable for the lubrication and protection of wire ropes under various working conditions.			
NOXAL ROPE DRESSING 5R SUPER	Manufactured from a mixture of selected mineral oils, bitumen and additives intended for the lubrication and protection of wire ropes under various working conditions.			

Fire Resistant Fluids		Specifications	Approvals	FUCHS recommendations
SOLCENIC 3C	HFA type fire resistant hydraulic fluid when diluted in water. The product is formulated with highly refined mineral oils and fortified with carefully selected emulsifiers and specialised additives.			

6. ANCILLARY FLUIDS



MAINTAIN

Engine coolants		Specifications	Approvals	FUCHS recommendations
MAINTAIN FRICOFIN DP	MAINTAIN FRICOFIN DP is an antifreeze coolant concentrate based on mono ethylene glycol. It is free from nitrite, amine and phosphate. Heavy duty vehicles are reliably protected against damages caused by cavitation, frost, corrosion, overheating especially in highly stressed aluminium engines. The latest developed SOAT component package (Silicated Organic Acid Technology) provides fast build up and long lasting surface protection.	AFNOR NF R 15-601 ASTM D 3306 ASTM D 4985 BS 6580	MAN 324 Type Si-OAT MB 325.5	SCANIA TB 1451 VW TL 774-G
MAINTAIN FRICOFIN	Super High Performance coolant additive based on monoethylene glycol. Free from nitrite, amine and phosphate.	ASTM D 3306 ASTM D 4985 AFNOR NF R 15-601 BS 6580:1992 BUNDESWEHR TL 6805-0038/1 SAE J1034	BMW GS 94000 (BMW N 600 69.0) DEUTZ TR 0199-99-1115 JENBACHER TA 1000-0201 MAN 324 NF MAN 324 NF PRITARDER MB-APPROVAL 325.0 MTU MTL 5048 MWM TR 0199-99-2091 PN-C 40007:2000 VOITH TURBO 172.00225010	BOMAG LIEBHERR TLV 035/ TLV 23009 A OPEL/GM B 040 0240 VW TL 774-C (G 11)
MAINTAIN FRICOFIN PREMIX 	Super High Performance Coolant Ready-Mix based on monoethylene glycol. Offers frost protection down to -35 °C. Free from nitrite, amine and phosphate.	ASTM D 3306-05 ASTM D 4985 AFNOR NF R 15-601 BS 6580:1992	MB-APPROVAL 326.0	

6. ANCILLARY FLUIDS

MAINTAIN

Brake Fluid/Fuel Additive		Specifications	Approvals	FUCHS recommendations
MAINTAIN STOP RED	Super High Performance brake fluid for hydraulic brake systems and clutch actuation in passenger cars, trucks and motorcycles.	FMVSS NR. 116 DOT 3/DOT 4 ISO 4925 CLASS 3/4 SAE J1703/J1704		
MAINTAIN DIESEL EFFECT	Super High Performance Fuel Additive improving diesel fuel properties for singular as well as constant treatment.			

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We therefore recommend that you consult a FUCHS EUROPE SCHMIERSTOFFE GMBH application engineer to discuss application conditions and the performance criteria of the products before the product is used. It is the responsibility of the user to test the functional suitability of the product and to use it with the corresponding care.

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