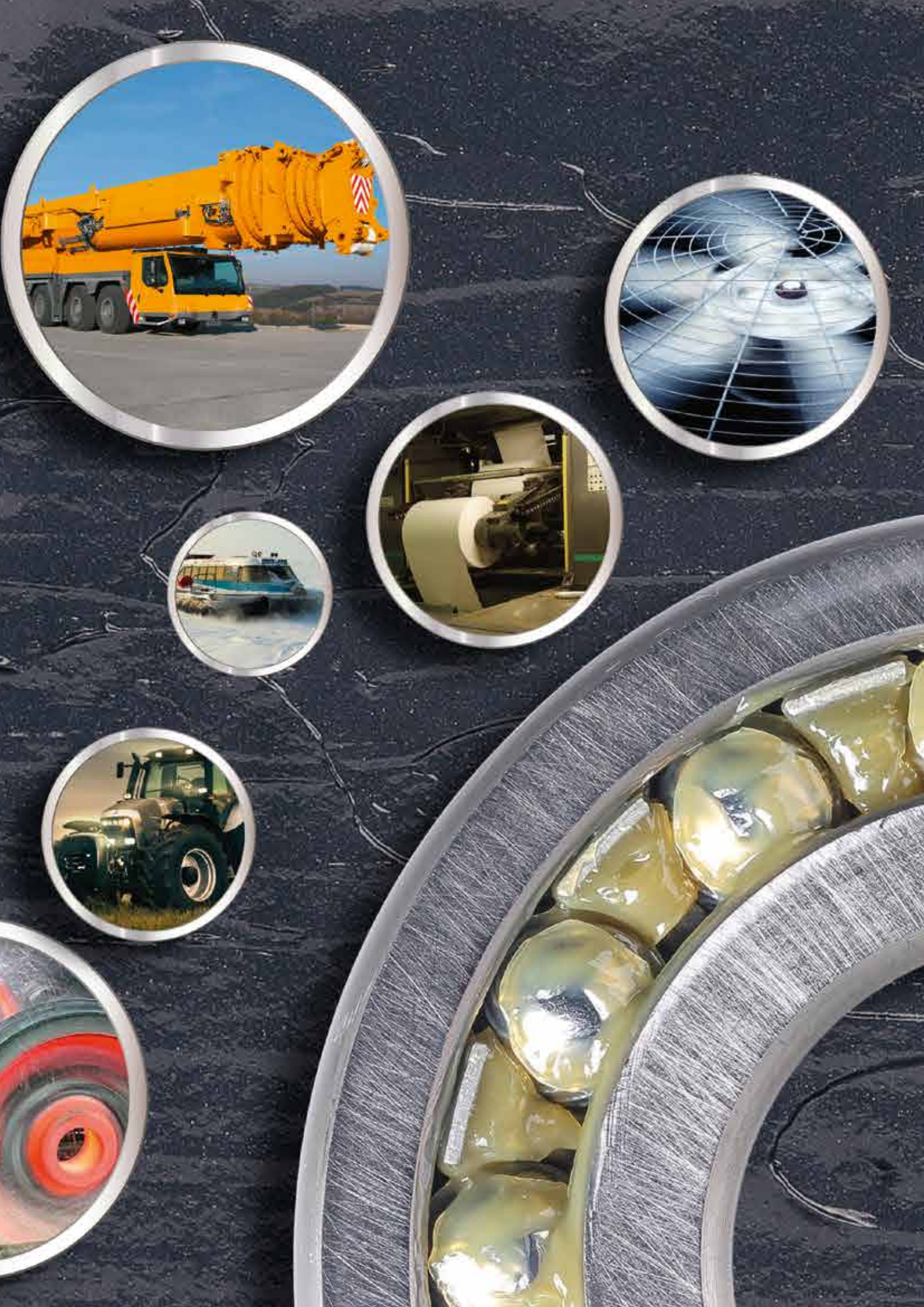
LUBRICATING GREASES FOR AUTOMOTIVE AND INDUSTRIAL APPLICATIONS

SIGNUM

LUKOIL



LUKOIL – PREPARED FOR THE FUTURE

Faster – further – better. The economic environment has changed significantly for European companies in recent years.

International competition has become tougher, and with falling margins quality is becoming more and more important as a differentiating factor. We at LUKOIL Lubricants have always seen the highest quality in products, selection and customer service as one of the central future concepts of our company.

AND SUCCESS PROVES US RIGHT.

EUROPEAN QUALITY
In our state-of-the-art production facilities in Vienna's Lobau, in Finland as well as in Romania, lubricants are produced based on first-class raw materials using innovative technologies.

COMPREHENSIVE CUSTOMER SERVICE
Customer service is the top priority in our daily work and is ensured at all times by our highly trained customer advisors and technicians. Our employees communicate intensively with our customers in order to become better acquainted with their individual problems and to be able to respond quickly with tailor-made solutions.

In addition to new products, these can also include solutions from the areas of waste recycling, packaging, marketing, logistics and process optimisation.

SHORT TRANSPORT ROUTES
The ideal location of the European production and storage facilities enables our experienced logistics team to transport our products efficiently and very quickly to our customers and thus to be able to offer on-time delivery.

SIGNUM

CUTTING-EDGE TECHNOLOGY FOR RELIABLE OPERATION

With the greases of the LUKOIL SIGNUM series, LUKOIL complements its wide range of lubricants with a flexible and user-oriented range of modern greases.

EFFECTIVE SOLUTION FOR YOUR COMPANY

An experienced and highly motivated team of scientists and technicians develops special greases according to your technical requirements. State-of-the-art knowledge and experience are incorporated into the development work.

- We are constantly working on improving quality, environmental compatibility and production technology.
- The research and development laboratory is extensively equipped and enables the implementation of the entire range of new requirements.
- An accredited laboratory carries out multi-level quality control.
- Our technicians and technical support will be happy to advise you on the selection of products and help you to optimise your processes.
- Equipment, machine and field tests are carried out, supervised and documented by agreement.

If you require further information about our products and assistance with the selection of lubricants, please contact our technical support: **www.lukhelp.com**

NOMENCLATURE - SIGNUM PORTFOLIO

LUKOIL SIGNUM SYNTH LXP 2-220

BASE OIL	THICKENER	ADDITIVE	NLGI CLASS	BASE OIL VISCOSITY [mm²/s] @40°C
SYNTH ... synthetic	L ... Lithium	M ... MoS_2	000	150
BIO ... biodegradable	A ... Aluminium	P ... EP	00	160
	C ... Calcium		1	220
	S ... Sulfonate		2	320
	X ... Complex		3	

LEGEND - ICONS/PICTOGRAMS

Explanation of symbols

- Approvals
- Roller bearings
- Plain bearings
- Gear boxes
- Joints and bolts
- Central lubrication
- Construction machinery in general
- Agricultural machinery in general
- Wheel bearings - passenger cars, commercial vehicles, construction and agricultural machinery
- Industry
- Guideways
- High temperature applications
- Low temperature applications
- EP property
- Tackyness
- Water resistant
- Salt water resistance
- Resistant to acids and alkalis
- Biodegradable

PRODUCTS

TECHNICAL DATA

Further information on our products and support in the selection of lubricants for various applications can be found in the LUKOIL lubricant advisor at **www.lukoil-lubricants.eu**. Our team will be happy to support you with technical questions and concerns at **www.lukhelp.com**.

	Unit	Standard	LUKOIL SIGNUM AX 1	LUKOIL SIGNUM CSXP 2-220	LUKOIL SIGNUM C 2-100	LUKOIL SIGNUM SYNTH LXP 2-220	LUKOIL SIGNUM LXP 2-220	LUKOIL SIGNUM M284	LU SI M
Product number			**589572**	**589540**	**589750**	**589530**	**589525**	**589760**	**58**
NLGI class		DIN 51818	1-2	2	2	2	2	2	
Colour			white	red	light brown	amber	blue	amber	a
Dropping point	°C	ISO 2176	250	330	96	290	265	270	
Solid lubricant			TiO_2	---	---	---	---	---	
Base oil			mineral	mineral	mineral	PAO	mineral	mineral	mi
Base oil viscosity at 40°C	mm^2/s	ASTM D445	220	220	100	220	220	120	
4-ball test; weld load	N	ASTM D2596	1300	4000	2600	3000	3000	2600	2
4-ball test; calotte diameter	mm	ASTM D2266	0.91	0.40	0.72	0.46	0.51	0.58	
Speed index	dn (mm/min)	DIN 51821	200,000	250,000	500,000	500,000	400,000	400,000	40
Copper corrosion	Level	ASTM D4048	-	1a	-	1a	1b	1	
Worked penetration	1/10 mm	ISO 2137	280-310	265-295	265-295	265-295	265-295	265-295	26
Temperature range	from °C		-30	-20	-30	-40	-30	-40	
	to °C		190	180	60	180	160	160	
Abbreviation		DIN 51825	KP 1 R-30	KP 2 R-20	K 2 C-30	KPHC 2 R-40	KP 2 P-30	KP 2 P-40	KP
Abbreviation		ISO 6743-9	L-XCGHB1	L-XBFHB2	L-XCAHA2	L-XDFEB2	L-XCEHB2	L-XDEEB2	L-X
Thickener			Aluminium complex	Calcium sulfonate complex	Calcium	Lithium complex	Lithium complex	Lithium complex	Li

Legal Notice: The information contained may be amended without prior notice. This table only provides an overview of the product specifications. You can find detailed i
Product & Technical Service details: www.lukhelp.com

LUKOIL SERVICES

UKOIL GNUM 1283	LUKOIL SIGNUM EPC 00	LUKOIL SIGNUM LPM 2-160	LUKOIL SIGNUM LP 00-150	LUKOIL SIGNUM LP 1-150	LUKOIL SIGNUM LP 2-150	LUKOIL SIGNUM LP 3-150	LUKOIL SIGNUM EPC 000 320	LUKOIL SIGNUM L 2-150	LUKOIL SIGNUM BIO LP 2-320
89770	589780	589515	589510	589511	589512	589513	589785	589508	589545
2	00/000	2	00	1	2	3	00/000	2	2
mber	beige brown	black	amber	amber	amber	amber	beige brown	amber	light brown
190	180	195	201	204	204	207	185	195	202
---	---	MoS_2	---	---	---	---	---	---	---
ineral	mineral	mineral	mineral	mineral	mineral	mineral	mineral	mineral	synthetic ester
188	40	160	150	150	150	150	320	150	320
2800	2000	4000	3000	3000	3000	3000	2200	1500	3000
0.53	0.68	0.45	0.55	0.50	0.50	0.50	0.69	0.77	0.55
00,000	800,000	400,000	400,000	400,000	400,000	350,000	100,000	400,000	300,000
1	1	1a	1a	1a	1a	1a	-	1b	1b
5-295	435-450	265-295	400-430	310-340	265-295	220-250	425-435	265-295	265-295
-30	-40	-30	-30	-30	-30	-30	-20	-30	-35
130	120	130	130	130	130	130	120	130	130
2 K-30	GP 00/000 K-40	KPF 2 N-30	KPG 00 N-30	KP 1 N-30	KP 2 N-30	KP 3 N-30	GP 00/000 K-20	K 2 N-30	KPE 2 N-35
CCEB2	L-XDCEB00	L-XCEHB2	L-XCDEB00	L-XCDEB1	L-XCDEB2	L-XCDEB3	L-XBCEB000	L-XCDEA2	L-XCCEB2
thium	Lithium	Lithium	Lithium	Lithium	Lithium	Lithium	Lithium	Lithium	Lithium

information on approvals and specifications in the technical data sheets (www.lukdocs.com).

LUKOIL

Adhesive grease based on aluminium complex soap

LUKOIL SIGNUM AX 1 *Prod.-No.: 589572*

APPLICATION (DIN 51825 - KP 1 R-30; ISO 6743-9 L-XCGHB1)

LUKOIL SIGNUM AX 1 is a special grease which can be used for lubricating points on vehicles, construction and agricultural equipment, industrial systems, as gear grease for electric hand tools and for lubricating points in steel and hydraulic engineering that come into contact with water. Application temperature from -30 to +190°C.

PROPERTIES

EFFECTIVE CORROSION PROTECTION
Minimises corrosion and the resulting wear

SALT WATER RESISTANCE
Optimum component protection in wet environment

HIGH OXIDATION RESISTANCE
Extends lubricant life and reduces maintenance and procurement costs

CHEMICAL RESISTANCE
Resistant in acidic and basic environment

EXCELLENT ADHESION
Water displacement function and reliable protection of the components

Lubricating grease based on calcium sulfonate complex soap

SIGNUM

LUKOIL SIGNUM CSXP 2-220 *Prod.-No.: 589540*

APPLICATION (DIN 51825 - KP 2 R-20; ISO 6743-9 L-XBFHB2)

LUKOIL SIGNUM CSXP 2-220 is ideally suited as a universal grease for roller bearings and can be used in a wide temperature range. It is especially used at high temperatures at which alkali-based greases can no longer be used. The formulation offers excellent salt water resistance, making it perfect for use where the presence of water cannot be avoided.

PROPERTIES

EFFECTIVE CORROSION PROTECTION
Minimises corrosion and the resulting wear

SALT WATER RESISTANCE
Allows use in wet conditions

REMARKABLE PROPERTIES
Ensures lubrication at peak temperatures up to +260°C

WIDE TEMPERATURE RANGE
Application range at temperatures of -20°C to +180°C

HIGH OXIDATION RESISTANCE
Extends lubricant life and reduces maintenance and procurement costs

Expert Feedback

Water is the most harmful natural substance for a roller bearing. It can reach the lubricating point unintentionally through moisture or as process water due to the process. As water is highly polar it also contributes to the ingress of dirt. In the maritime sector, for example, salt can enter the bearing. Many greases are not permanently resistant to water, which leads to decomposition of the grease and bearing leakage, especially in metallurgical processes with process water cooling. This results in insufficient lubrication, corrosion and cavitation. In maritime applications, the aqueous salt solution acts as an electrolyte, which additionally attacks the bearings by anodic corrosion. LUKOIL SIGNUM CSXP 2-220 adheres extremely strongly to metal surfaces, encloses the water and ensures optimum protection, even under high water loads.

Dipl.-Ing Dr. Karin Baumann
Head of Product Management

Lubricating grease based on calcium soap

LUKOIL SIGNUM C 2-100 *Prod.-No.: 589750*

APPLICATION (DIN 51825 - K 2 C-30; ISO 6743-9 L-XCAHA2)

LUKOIL SIGNUM C 2-100 is suitable for plain and roller bearings on construction machinery, commercial vehicles, agricultural machinery, for water and caustic pumps, in sewage treatment plants and in industrial use with water ingress and for bearing lubrication at low temperatures.

PROPERTIES

EFFECTIVE CORROSION PROTECTION
Minimises corrosion and the resulting wear

SALT WATER RESISTANCE
Allows use in wet conditions

HIGH OXIDATION RESISTANCE
Extends lubricant life and reduces maintenance and procurement costs

CHEMICAL RESISTANCE
Resistant in acidic and basic environment

LUKOIL

Synthetic lubricating grease based on lithium complex soap

LUKOIL SIGNUM SYNTH LXP 2-220 *Prod.-No.: 589530*

APPLICATION (DIN 51825 - KPHC 2 R-40; ISO 6743-9 L-XDFEB2)

LUKOIL SIGNUM SYNTH LXP 2-220 is intended for use in slide and roller bearings that work under difficult conditions at high speeds and at temperatures from -40°C to + 180°C. Due to its excellent pumpability through long pipelines, it can be used in central lubrication systems. Use is recommended above all for lifetime fillings and fans.

PROPERTIES

EFFECTIVE CORROSION PROTECTION
Minimises corrosion and the resulting wear

EXCELLENT ADHESION
Allows use in wet conditions

RESISTANCE TO WATER
Allows use on machinery and vehicles where contact with water is unavoidable

PUMPABLE
Good pumpability through long pipelines

LARGE TEMPERATURE RANGE
Stable at temperatures of -40°C to +180°C

HIGH OXIDATION RESISTANCE
Extends the service life of the lubricant and reduces maintenance and procurement costs

WEAR PROTECTION
Protection of components even under extreme conditions

CHEMICAL RESISTANCE
Stability of the lubricant, decomposition or oxidation are prevented

Expert Feedback

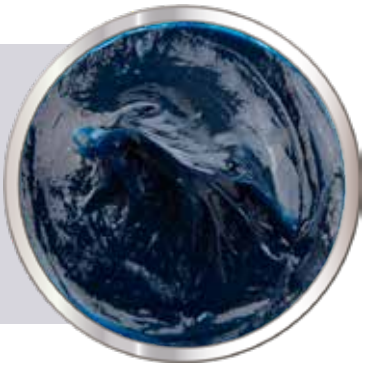
If the tribological properties of lubricating greases reach their application limits, the structure of the grease must be completely redesigned. Such limits arise when extreme operating conditions meet exceptional customer requirements. The temperature in desert climates can vary between -40°C in winter and +60°C in summer. If the user demands a year-round grease with long-term stability, the grease manufacturer has to reach deep into his bag of tricks and completely rethink the soap base, the additives and the base oil used. With LUKOIL SIGNUM SYNTH LXP 2-220, all parameters have been combined into a revolutionary long-term grease for extreme requirements. The synthetic base oil with a special lithium complex soap thickener and additives matched to it guarantees extremely long service life at temperatures from -40°C to +180°C and thus enables long-term lubrication even under extreme conditions.

Dipl.-Ing Dr. Karin Baumann
Head of Product Management

Lubricating grease based on lithium complex soap

SIGNUM

LUKOIL SIGNUM LXP 2-220 *Prod.-No.: 589525*



APPLICATION (DIN 51825 - KP 2 P-30; ISO 6743-9 L-XCEHB2)

LUKOIL SIGNUM LXP 2-220 can be used in roller and plain bearings in vehicles and in work and production machinery. The universal area of application reduces both the risk of mix-up and storage costs. The application range is between –30°C and +160°C. The very good water resistance guarantees reliable lubrication and the best possible corrosion protection, which enables a longer component life.

PROPERTIES

UNIVERSAL GREASE
Universal application area reduces the risk of mix-up and storage costs

EFFECTIVE CORROSION PROTECTION
Minimises corrosion and the resulting wear

STABLE LUBRICANT FILM
Protects the bearings even under heavy loads and shock loads

RESISTANCE TO WATER
Allows use on machinery and vehicles where contact with water is unavoidable
Increased resistance to static and dynamic water effects

PUMPABLE
Good pumpability through long pipelines

COMPLEX THICKENER
Mechanically and thermally highly resilient

THE APPROVALS ASTM D-4950 GC-LB

Expert Feedback

High temperatures trigger a variety of chemical reactions, almost all of which can be harmful to machine parts and the lubricating grease. Whether in northern or southern Europe, there are applications everywhere where high or extremely high temperatures occur. On the one hand, these can be caused by high running speeds or by thermal radiation when processing extremely hot materials. In these cases, grease manufacturers face particular challenges. By combining cutting-edge technologies and processing methods, we have succeeded in creating a range of greases that protect both the machine and the grease itself from excessive oxidation and reduce the evaporation of grease components to a minimum. In this way, the machines and the environment can be optimally protected. LUKOIL SIGNUM LXP 2-220 is therefore the ideal choice for processes where other greases are not up to the mark.

Dipl.-Ing Dr. Karin Baumann
Head of Product Management

LUKOIL

Lubricating grease based on lithium complex soap

LUKOIL SIGNUM M284 *Prod.-No.: 589760*

APPLICATION (DIN 51825 - KP 2 P-40; ISO 6743-9 L-XDEEB2)

LUKOIL SIGNUM M284 is a long-term lubricating grease for roller and plain bearings subject to high pressure at elevated temperatures, in particular for lubrication in the motor vehicle sector for high-speed wheel bearings in passenger cars, commercial vehicles and construction machinery. This universal grease is characterized by a high level of wear protection and meets the requirements of commercial vehicle manufacturers for use in central lubrication systems.

PROPERTIES

UNIVERSAL GREASE
Universal application area reduces the risk of mix-up and storage costs

EFFECTIVE CORROSION PROTECTION
Minimises corrosion and the resulting wear

STABLE LUBRICANT FILM
Protects the bearings even under heavy loads and shock loads

RESISTANCE TO WATER
Allows use on machinery and vehicles where contact with water is unavoidable
Increased resistance to static and dynamic water effects

PUMPABLE
Good pumpability through long pipelines

COMPLEX THICKENER
Mechanically and thermally highly resilient

HIGH OXIDATION RESISTANCE
Extends lubricant life and reduces maintenance and procurement costs

WEAR PROTECTION ADDITIVATION
Reduces the coefficient of friction and enables long component life

THE APPROVALS MAN 284 Li-H 2; MB-Approval 265.1

Lubricating grease based on lithium soap

SIGNUM

LUKOIL SIGNUM M283 *Prod.-No.: 589770*

APPLICATION (DIN 51825 - KP 2 K-30; ISO 6743-9 L-XCCEB2)

LUKOIL SIGNUM M283 features high wear protection in an operating temperature range of -30 to +130°C, as specified by many manufacturers. This universal grease is ideally suited for central lubrication systems in commercial vehicles as well as for the lubrication of roller bearings of various types in electric motors, machine tools, wheel bearings in passenger vehicles, commercial vehicles and construction machinery.

PROPERTIES

UNIVERSAL GREASE
Universal application area reduces the risk of mix-up and storage costs

EFFECTIVE CORROSION PROTECTION
Minimises corrosion and the resulting wear

WEAR REDUCING HIGH PRESSURE ADDITIVES
Protection of the components, even under high sliding and shock loads

RESISTANCE TO WATER
Allows use on machinery and vehicles where contact with water is unavoidable
Increased resistance to static and dynamic water effects

PUMPABLE
Good pumpability through long pipelines

HIGH OXIDATION RESISTANCE
Extends lubricant life and reduces maintenance and procurement costs

THE APPROVALS MAN 283 Li-P 2; MB-Approval 267.0

LUKOIL SIGNUM EPC 00 *Prod.-No.: 589780*

APPLICATION (DIN 51826 – GP 00/000 K-40; ISO 6743-9 L-XDCEB00)

LUKOIL SIGNUM EPC 00 is ideally suited for central lubrication systems, especially in commercial vehicles and construction machinery, as chassis grease, for transmissions and geared motors that are not encapsulated oil-tight, for sliding surfaces and guide-ways. Excellent corrosion protection guarantees reliable protection of the components against road salt and the associated risk of rust. This fluid grease is characterized by high wear protection and meets the requirements of manufacturers for central lubrication systems in commercial vehicles.

PROPERTIES

INCREASED RESILIENCE
Reliably lubricates even under extreme pressure

EFFECTIVE CORROSION PROTECTION
Minimises corrosion and the resulting wear

RESISTANCE TO WATER
Allows use on machinery and vehicles where contact with water is unavoidable

PUMPABLE
Good pumpability through long pipelines

HIGH OXIDATION RESISTANCE
Extends lubricant life and reduces maintenance and procurement costs

HIGH PRESSURE CAPACITY
Protection of the components, even under high sliding and shock loads

COLD FLOW BEHAVIOUR
Optimized cold start properties

THE APPROVALS BIELOMATIK; LINCOLN; MAN 283 Li-P 00/000; MB-Approval 264.0; STIEBEL Getriebe A2000; VOGEL/SKF Lubrication System

LUKOIL SIGNUM LPM 2-160 *Prod.-No.: 589515*

APPLICATION (DIN 51825 - KPF 2 N-30; ISO 6743-9 L-XCEHB2)

LUKOIL SIGNUM LPM 2-160 can withstand high mechanical and thermal loads and guarantees reliable protection of the components even under high sliding and shock loads. Even after temporarily exceeding the dropping point, it retains its normal appearance as well as its normal properties. The universal application area reduces the risk of mix-up and storage costs. It remains at the lubricating point over a wide temperature range.

PROPERTIES

EFFECTIVE CORROSION PROTECTION
Minimises corrosion and the resulting wear

STABLE LUBRICANT FILM
Protects bearings even under heavy loads and shock loads

CONTAINS SOLID LUBRICANTS
MoS_2 gives emergency running properties in case of high pressures, low sliding speeds or poor surface conditions. Minimises the stick-slip effect

WATER RESISTANCE
Enables use in machines and vehicles where contact with water is unavoidable

LONG-TERM HIGH-PRESSURE GREASE
Ideally suited for extended relubrication intervals and for temporary peak temperatures up to +150°C

Expert Feedback

In the case of very heavy, slowly moving objects, the highest dynamic loads occur due to the inertia. Under these conditions, boundary friction can occur when the lubricant is forced out of the lubricating gap. With boundary friction, the friction partners would be in direct contact and wear out. Replacing such worn components is very time-consuming and expensive. To counteract boundary friction, our LUKOIL SIGNUM LPM 2-160 effectively supplies the surfaces of the friction partners with solid lubricants. LUKOIL SIGNUM LPM 2-160 is also highly adhesive and resistant to oxidation so that it is not displaced from the lubricating gap and remains stable even at high friction temperatures.

Dipl.-Ing Dr. Karin Baumann
Head of Product Management

Lubricating grease based on lithium soap

SIGNUM

LUKOIL SIGNUM LP 00-150 *Prod.-No.: 589510*

APPLICATION (DIN 51826 – KPG 00 N-30; ISO 6743-9 L-XCDEB00)

LUKOIL SIGNUM LP 00-150 can be used in roller and plain bearings of vehicles, working and production machinery. Due to its excellent pumpability it is ideally suited for central lubrication systems. The universal application area reduces the risk of mix-up and storage costs. This fluid grease is also designed for continuous operation at high pressure and in a wide temperature range. It remains at the lubricating point over a wide temperature range.

PROPERTIES

INCREASED RESILIENCE
Reliably lubricates even under extreme pressure

EFFECTIVE CORROSION PROTECTION
Minimises corrosion and the resulting wear

STABLE LUBRICANT FILM
Protects the bearings even under heavy loads and shock loads

RESISTANCE TO WATER
Allows use on machinery and vehicles where contact with water is unavoidable

PUMPABLE
Good pumpability through long pipelines

HIGH OXIDATION RESISTANCE
Extends lubricant life and reduces maintenance and procurement costs

LUKOIL SIGNUM LP 1-150 *Prod.-No.: 589511*

APPLICATION (DIN 51825 - KP 1 N-30; ISO 6743-9 L-XCDEB1)

LUKOIL SIGNUM LP 1-150 can be used in roller and plain bearings of vehicles, working and production machinery. Due to its excellent pumpability it is ideally suited for central lubrication systems. The universal application area reduces the risk of mix-up and storage costs. It remains at the lubricating point over a wide temperature range.

PROPERTIES

INCREASED RESILIENCE
Reliably lubricates even under extreme pressure

EFFECTIVE CORROSION PROTECTION
Minimises corrosion and the resulting wear

STABLE LUBRICANT FILM
Protects the bearings even under heavy loads and shock loads

RESISTANCE TO WATER
Allows use on machinery and vehicles where contact with water is unavoidable

PUMPABLE
Good pumpability through long pipelines

UNIVERSAL GREASE
Universal application area reduces the risk of mix-up and storage costs.

Expert Feedback

Due to the variety of applications and the prevailing climatic and operational conditions, the development of universal greases is one of the greatest challenges in tribology. With our markets stretching from tropical to arctic regions, experience and chemical expertise play an important role in the development of greases. A good universal grease must protect against corrosion both on salty coasts and in the south under hot and humid conditions, reliably lubricate the friction partners and guarantee the reliable start of vehicles and machinery after cold nights in the far north. As a customer, you have the advantage that our products work reliably in all climate zones.

Dipl.-Ing Dr. Karin Baumann
Head of Product Management

LUKOIL SIGNUM LP 2-150 *Prod.-No.: 589512*

APPLICATION (DIN 51825 - KP 2 N-30; ISO 6743-9 L-XCDEB2)

LUKOIL SIGNUM LP 2-150 can be used in roller and plain bearings of vehicles, working and production machinery. Due to its excellent pumpability it is ideally suited for central lubrication systems. The universal application area reduces the risk of mix-up and storage costs. It remains at the lubricating point over a wide temperature range.

PROPERTIES

INCREASED RESILIENCE
Reliably lubricates even under extreme pressure

EFFECTIVE CORROSION PROTECTION
Minimises corrosion and the resulting wear

STABLE LUBRICANT FILM
Protects the bearings even under heavy loads and shock loads

RESISTANCE TO WATER
Allows use on machinery and vehicles where contact with water is unavoidable

PUMPABLE
Good pumpability through long pipelines

UNIVERSAL GREASE
Universal application area reduces the risk of mix-up and storage costs.

LUKOIL SIGNUM LP 3-150 *Prod.-No.: 589513*

APPLICATION (DIN 51825 - KP 3 N-30; ISO 6743-9 L-XCDEB3)

LUKOIL SIGNUM LP 3-150 can be used in roller and plain bearings of vehicles, working and production machinery. The universal application area reduces the risk of mix-up and storage costs. It remains at the lubricating point over a wide temperature range.

PROPERTIES

INCREASED RESILIENCE
Reliably lubricates even under extreme pressure

EFFECTIVE CORROSION PROTECTION
Minimises corrosion and the resulting wear

STABLE LUBRICANT FILM
Protects the bearings even under heavy loads and shock loads

RESISTANCE TO WATER
Allows use on machinery and vehicles where contact with water is unavoidable

PUMPABLE
Good pumpability through long pipelines

UNIVERSAL GREASE
Universal application area reduces the risk of mix-up and storage costs.

STIFF LUBRICATING GREASE
Adheres to the lubricating point and seals it

LUKOIL SIGNUM EPC 000 320 *Prod.-No.: 589785*

APPLICATION (DIN 51826 – GP 00/000 K-20; ISO 6743-9 L-XBCEB000)

LUKOIL SIGNUM EPC 000 320 is best suited for central lubrication systems, for transmissions, worm gears and geared motors that are not encapsulated oil-tight and for sliding surfaces and guideways. This fluid grease is also designed for continuous operation at high pressure and in a wide temperature range.

PROPERTIES

INCREASED RESILIENCE
Reliably lubricates even under extreme pressure

EFFECTIVE CORROSION PROTECTION
Minimises corrosion and the resulting wear

RESISTANCE TO WATER
Allows use on machinery and vehicles where contact with water is unavoidable

PUMPABLE
Good pumpability through long pipelines

HIGH OXIDATION RESISTANCE
Extends lubricant life and reduces maintenance and procurement costs

HIGH PRESSURE CAPACITY
Protection of the components, even under high sliding and shock loads

COLD FLOW BEHAVIOUR
Optimised cold start properties

ADHESION
Prevents the ingress of water

LUKOIL SIGNUM L 2-150 *Prod.-No.: 589508*

APPLICATION (DIN 51825 - K 2 N-30; ISO 6743-9 L-XCDEA2)

LUKOIL SIGNUM L 2-150 can be used in roller and plain bearings of vehicles, working and production machinery. Due to its excellent pumpability through long pipelines, it can be used in central lubrication systems. The universal application area reduces the risk of mix-up and storage costs. It remains at the lubricating point over a wide temperature range.

PROPERTIES

EFFECTIVE CORROSION PROTECTION
Minimises corrosion and the resulting wear

STABLE LUBRICANT FILM
Protects the bearings even under heavy loads and shock loads

RESISTANCE TO WATER
Allows use on machinery and vehicles where contact with water is unavoidable

PUMPABLE
Good pumpability through long pipelines

MULTI-PURPOSE GREASE
Universal application area reduces the risk of mix-up and storage costs.

LUKOIL

Environmentally friendly lubricating grease based on lithium soap

LUKOIL SIGNUM BIO LP 2-320 *Prod.-No.: 589545*

APPLICATION (DIN 51825 - KPE 2 N-35, ISO 6743-9 L-XCCEB2)

LUKOIL SIGNUM BIO LP 2-320 is a long-term grease for the lubrication of highly loaded roller and plain bearings, especially for loss lubrication systems in which the escaping lubricant can get into the water and soil. It is used in central lubrication systems in commercial and rail vehicles, construction and agricultural machinery, in the wood industry, as well as for lubrication of switches in open gears or wire ropes.

PROPERTIES

BIODEGRADABLE
The risk to the environment through leakage or unavoidable loss is significantly reduced

MANUFACTURED FROM SUSTAINABLE RAW MATERIALS
The environment and resources are conserved

RESISTANCE TO WATER
Allows use on machinery and vehicles where contact with water is unavoidable

ADHESIVE-STICKY
Adheres to metal surfaces and reliably protects them against oxidation, corrosion and wear, especially for open lubricating points

EFFECTIVE CORROSION PROTECTION
Minimises corrosion and the resulting wear

LONG-LASTING PROTECTION
Optimised consumption of grease cost reduction

ENERGY SAVING
Reduces the energy consumption of open gears

WIDE TEMPERATURE APPLICATION RANGE
Stable lubricating film at large temperature fluctuations

CONVERSION TABLE/INFORMATION ON OLD AND NEW GREASES:

OLD PRODUCT NAME	NEW PRODUCT NAME
LUKOIL AQUAFLEX EP 2-180	LUKOIL SIGNUM CSXP 2-220
LUKOIL GREASE C2	LUKOIL SIGNUM C 2-100
LUKOIL GREASE L2	LUKOIL SIGNUM L 2-150
LUKOIL POLYFLEX EP 00-160	LUKOIL SIGNUM LP 00-150
LUKOIL POLYFLEX EP 1-160	LUKOIL SIGNUM LP 1-150
LUKOIL POLYFLEX EP 2-160	LUKOIL SIGNUM LP 2-150
LUKOIL POLYFLEX EP 2-160 HD	LUKOIL SIGNUM LPM 2-160
LUKOIL POLYFLEX EP 3-160	LUKOIL SIGNUM LP 3-150
LUKOIL SIGNUM BD 2	LUKOIL SIGNUM BIO LP 2-320
LUKOIL SIGNUM EPW 2	LUKOIL SIGNUM LXP 2-220
LUKOIL SYNTHOFLEX 2-100	LUKOIL SIGNUM SYNTH LXP 2-220
LUKOIL THERMOFLEX EP 2-180	LUKOIL SIGNUM LXP 2-220

LUKOIL

APPLICATIONS

	Product number	Approvals	Recommended application area	Roller bearing	Plain bearings
LUKOIL SIGNUM AX 1	589572		Industry/Automotive	✔	✔
LUKOIL SIGNUM CSXP 2-220	589540		Industry/Automotive	✔	
LUKOIL SIGNUM C 2-100	589750		Industry/Automotive	✔	✔
LUKOIL SIGNUM SYNTH LXP 2-220	589530		Industry	✔	✔
LUKOIL SIGNUM LXP 2-220	589525	ASTM D-4950 GC-LB	Industry/Automotive	✔	
LUKOIL SIGNUM M284	589760	MAN 284 Li-H 2; MB-Approval 265.1	Industry/Automotive	✔	✔
LUKOIL SIGNUM M283	589770	MAN 283 Li-P 2; MB-Approval 267.0	Automotive	✔	✔
LUKOIL SIGNUM EPC 00	589780	BIELOMATIK; LINCOLN; MAN 283 Li-P 00/000; MB approval 264.0; STIEBEL Getriebe A2000; VOGEL/SKF lubrication system	Automotive		
LUKOIL SIGNUM LPM 2-160	589515		Industry/Automotive	✔	✔
LUKOIL SIGNUM LP 00-150	589510		Industry/Automotive	✔	✔
LUKOIL SIGNUM LP 1-150	589511		Industry	✔	✔
LUKOIL SIGNUM LP 2-150	589512		Industry/Automotive	✔	✔
LUKOIL SIGNUM LP 3-150	589513		Industry/Automotive	✔	✔
LUKOIL SIGNUM EPC 000 320	589785		Industry		
LUKOIL SIGNUM L 2-150	589508		Industry/Automotive	✔	✔
LUKOIL SIGNUM BIO LP 2-320	589545		Industry/Automotive	✔	✔

Note: Please find the legend of the symbols on page 6.

Gear box	Joints and bolts	Central lubrication	Wheel bearings	Further use
				Boats, mills, sewage treatment plants, ballast and gravel plants, paper industry, gear grease for electric hand tools, steel industry
	✔			Pellet presses, steel industry, sugar industry
		✔		Water and caustic pumps, in sewage treatment plants and for industrial applications in contact with water
✔		✔		Steel, paper, chemical and cement industries, elevators, lifetime fillings, asphalt pavers, conveyor systems, hot air fans
	✔	✔	✔	Mining, pumps and electric motors
		✔	✔	
		✔	✔	Electric motors, machine tools
✔		✔		Chassis grease
	✔		✔	5th wheel, emergency running properties
✔	✔	✔		
✔	✔	✔		
	✔	✔	✔	
	✔			
✔		✔		Worm gears
		✔	✔	
✔		✔	✔	Environmentally sensitive applications, wire ropes, open gears

LUKOIL

PROPERTIES

	Product number	High temperature	Low temperature	EP property	Adhesion/ tackiness	Water resistance	Resistance to acids and alkalis	Salt water resistance
LUKOIL SIGNUM AX 1	589572	✔		✔	✔	✔	✔	✔
LUKOIL SIGNUM CSXP 2-220	589540	✔		✔	✔	✔		✔
LUKOIL SIGNUM C 2-100	589750		✔			✔	✔	✔
LUKOIL SIGNUM SYNTH LXP 2-220	589530	✔	✔	✔	✔	✔	✔	
LUKOIL SIGNUM LXP 2-220	589525	✔	✔	✔	✔	✔		
LUKOIL SIGNUM M284	589760	✔		✔	✔	✔		
LUKOIL SIGNUM M283	589770	✔		✔		✔		
LUKOIL SIGNUM EPC 00	589780			✔				
LUKOIL SIGNUM LPM 2-160	589515	✔		✔	✔	✔		
LUKOIL SIGNUM LP 00-150	589510			✔				
LUKOIL SIGNUM LP 1-150	589511			✔		✔		
LUKOIL SIGNUM LP 2-150	589512			✔		✔		
LUKOIL SIGNUM LP 3-150	589513			✔		✔		
LUKOIL SIGNUM EPC 000 320	589785			✔	✔			
LUKOIL SIGNUM L 2-150	589508					✔	✔	
LUKOIL SIGNUM BIO LP 2-320	589545			✔	✔	✔		

Note: Please find the legend of the symbols on page 6.

LUKOIL SERVICES

CONSISTENCY INDICATORS
in accordance with DIN 51825

What is worked penetration in lubricating greases?

The consistency of greases is specified in NLGI classes (NLGI = National Lubricating Grease Institute). The measurement is made with a special device according to DIN ISO 2137, where a cone is immersed in the grease at a temperature of 25°C. The penetration depth is measured in 1/10 mm. In most cases, it is indicated whether the penetration is "worked" or "unworked". The difference between these values indicates how well the grease can withstand a mechanical load. The smaller the difference, the more resistant the grease is.
The NLGI defines nine classes depending on the measured value. The assignment of a measured cone penetration to a defined NLGI class is based on DIN 51825. The larger the class number, the harder the grease, with values ranging from 000 to 6.
Normally, NLGI class 2 greases are used for bearings and joints.

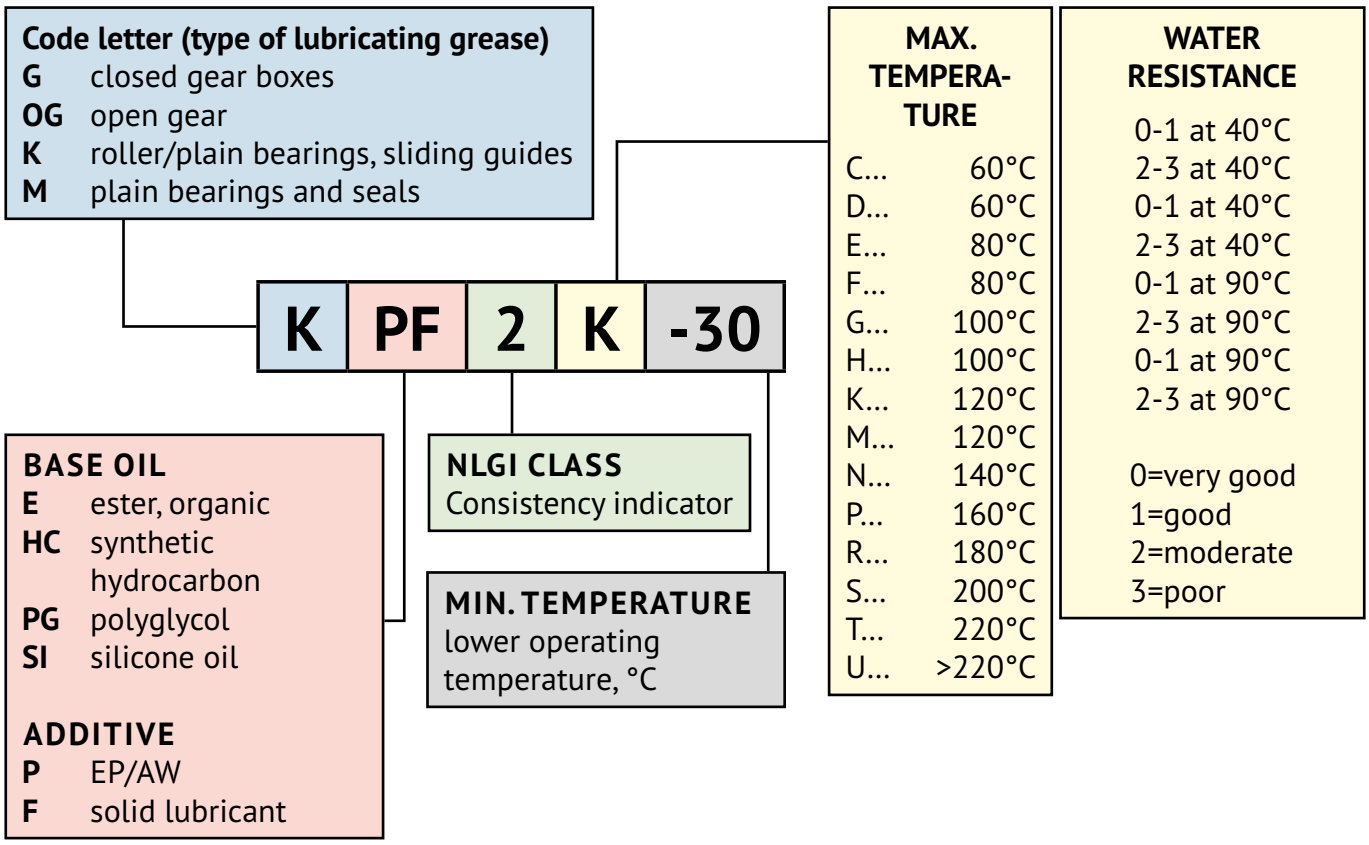
Consistency numbers for lubricating greases: DIN 51825

NLGI CLASS	WORKED PENETRATION in accordance with DIN ISO 2137 units[1)]
000	445 to 475
00	400 to 430
0	355 to 385
1	310 to 340
2	265 to 295
3	220 to 250
4	175 to 205
5	130 to 160
6	85 to 115

[1)] 1 unit corresponds to 0.1 mm

CLASSIFICATION

of greases in accordance with DIN 51502



LUKOIL SERVICES

CLASSIFICATION

of greases in accordance with ISO 6743- 9

LUKOIL SIGNUM LPM 2-160 → L-XCEHB2

Item 1		Item 2		Item 3			Item 4		Item 5	
				Water contamination			EP properties		NLGI class	Worked penetration
Index	Lower operating tempera-ture, °C	Index	Upper operating tempera-ture, °C	Index	Environ-mental conditions	Corrosion protection	Index		000	445 to 475
A	0	A	60	A	L	L	A	no EP properties	00	400 to 430
B	-20	B	90	B	L	M	B	EP properties	0	355 to 385
C	-30	C	120	C	L	H			1	310 to 340
D	-40	D	140	D	M	L			2	265 to 295
E	<-40	E	160	E	M	M			3	220 to 250
		F	180	F	M	H			4	175 to 205
		G	>180	G	H	L			5	130 to 160
				H	H	M			6	85 to 115
				I	H	H				

Environmental conditions:	Anti-rust protection:
L - dry	L - no protection
M – water, static	M – water protection
H – water, dynamic	H – salt water protection

LUKOIL

TYPICAL PROPERTIES OF THE MOST COMMON THICKENERS

Thickener	Upper operating temperature (max. °C)	Dropping point [°C]	Mechanical stability	Water resistance	Typical application		NLGI classes
Anhydrous calcium	60-80	<100	good	very good	Seals, chains	Construction machinery, agriculture	2
Calcium sulfonate complex	150-180	<330	very good	very good	Bearings, seals, chains, joints and bolts	Industry (pellet presses, steel, sugar production) Construction machinery Agriculture (underwater lubricating point)	2
Lithium	120-130	170/200	good	average	Bearings	Multi-purpose grease	000, 00, 1, 2, 3
Lithium complex	140-180	>220	very good	good	Bearings	Multi-purpose grease	2
Aluminium complex	140-190	>230	average	very good	Gear bearings	Industry, Special applications (food, paper)	1, 2

COMPATIBILITY OF THICKENERS

LUKOIL SERVICES

Thickener	Calcium	Calcium-complex	Calcium sulfonate complex	Lithium	Lithium-complex	Lithium/calcium	Bentonite	Aluminium complex	Polyurea
Calcium	V	T	T	V	V	V	T	N	T
Calcium-complex	T	V	V	T	V	V	N	N	V
Calcium sulfonate complex	T	V	V	T	V	V	N	N	V
Lithium	V	T	T	V	V	V	N	N	V
Lithium complex	V	V	V	V	V	V	N	V	V
Lithium/calcium	V	V	V	V	V	V	N	N	V
Bentonite	T	N	N	N	N	N	V	N	T
Aluminium complex	N	N	N	N	V	N	N	V	T
Polyurea	T	V	V	V	V	V	T	T	V

V = compatible N = not compatible T = technical clarification required

If you require further information about our products and assistance with the selection of lubricants, please contact our technical support: **www.lukhelp.com**

WHAT YOU ALWAYS WANTED TO KNOW ABOUT GREASES

In all branches of industry, lubricating greases are used instead of lubricating oils, where it is not possible to use oils from an technical and/or economic point of view. Compared to liquid lubricants, greases have the following advantages:

- Minimization of shock loads
- Sealing of components against dirt and water
- Lower risk of leakage due to better sealing effect
- Better lubricity in mixed and boundary friction regimes
- Lubrication of auxiliary units and safety components
- Long-term lubrication
- Reduced maintenance

Lubricating greases are construction elements, especially when used as long-term lubrication.

Structure of lubricating greases

Depending on the requirements, various additives and a thickener are used to create a lubricating grease from the base oil. The thickener stores the lubricant and releases it to the lubricating point as needed. When the kinetic energy is no longer effective, the oil with the additives is reabsorbed by the thickener, thus binding the lubricant at the lubrication point. A wide variety of thickeners are used, such as metal and metal complex soaps (e.g. from lithium, calcium, aluminum) and soap-free thickeners (gels, polyurethanes and bentonite).

Main requirements for greases

The minimum requirements for greases are regulated in the standards DIN 51502, DIN 51825 (lubricating greases K) and DIN 51826 (lubricating greases G) as well as in ISO 6743 Part 9: Family X (greases).

Identification of lubricating greases in accordance with DIN 51502

DIN 51502 deals with the classification of lubricating greases. Among other things, the intended use, base oil type, additives, upper operating temperature and behaviour towards water are specified here.

Base oil

Particular importance is attached to the selection of the base oil and its viscosity. It must be selected depending on the intended use.

LUKOIL

WHAT YOU ALWAYS WANTED TO KNOW ABOUT GREASES

Types of grease

Lithium soap lubricating greases

Lithium soap lubricating greases have been produced since the early 1950s. Lithium greases are sufficiently water-resistant and at the same time can cope with thermal stress. This type of grease combines the advantages of calcium and sodium greases without their disadvantages. Lithium soap lubricating greases are therefore the most widely used lubricating greases today.

To further improve grease quality complex soaps made of lithium, calcium or aluminum are used. Their dropping points are much higher than those of standard metal soap greases.

Lithium complex greases

They are preferably used in hard-to-reach industrial bearings as well as car and truck wheel bearings. When using synthetic base oils, their operating temperature range can be increased.

Calcium soap lubricating greases

Calcium soap lubricating greases, also called lime greases, are preferred for applications where good water tolerance is required. Due to their natural water content, they are not suitable for high temperatures.

Calcium sulfonate complex greases

Calcium sulfonate complex greases offer very good water resistance, natural adhesion and excellent mechanical stability. Greases based on this thickener are suitable for use at high temperatures. Due to its salt water resistance, it can be used in wet applications or in coastal areas when exposed to sea water.

Aluminum complex greases

In high-temperature applications around 150°C, aluminium complex greases have proven themselves very well; they can even handle peaks of 200°C for a short time if temperature-stable base oils are used. Due to their very high water resistance, they are used in hydraulic engineering and shipping.

Fluidgreases for central lubrication systems in commercial vehicles

Commercial vehicles are increasingly equipped with central lubrication systems. These systems supply kingpins, spring bolts, automatic linkage adjusters, brake shafts, brake cams, drawbars, trailer hitches, turntables and handbrake levers with grease.

Miscibility of greases

Lubricating greases with the same thickener and similar base oil and approximately the same consistency can normally be mixed without adverse consequences. They are generally considered to be compatible with each other. In case of doubt, a compatibility test can be carried out. Bearing cleaning followed by refilling is always preferable to mixing different greases. If you have any questions, please contact the application engineer. For details, see the table on page 29.

Worked penetration in accordance with DIN 51818

Worked Penetration at 25°C is the depth that a standard cone penetrates the grease sample under prescribed conditions of cone weight and time immediately after it has been subjected to 60 double strokes in a standard grease worker. More details are explained on page 25.

Consistency classification in NLGI classes

NLGI = National Lubricating Grease Institute

Consistency is the resistance of a grease to its deformation. DIN 51818 divides lubricating greases into NLGI classes. Very soft greases in classes 000 to 0 are known as "fluid greases". For details, see the table on page 25.

Environmental aspects

Grease lubrication is often long-term without major environmental impact. In other cases, however lubricant loss may occur due to frequent relubrication during operation. If grease is released into the enviromnent, rapidly biodegradable greases without toxic or bioaccumulative components are beneficial.

Additives

As with lubricating oils, additives are also used in lubricating greases:

- Extreme pressure
- Anti wear
- Corrosion protection
- Antioxidants
- Adhesive additives
- Solid lubricants

Operating temperature

A grease provides its best lubricating performance in this temperature range. For a short time, a grease can also be exposed to a higher temperature.

Dropping point

The dropping point is the measured temperature at which a lubricating grease drips out of the test device under test conditions.

PACKING DESCRIPTION

180 KG STEEL LID BARREL

Height 880 mm
Diameter 585 mm
Sales unit 1 item
4 items per pallet
Industrial pallet 120 x 120 x 14 cm

50 KG STEEL HOBBOCK

Height 660 mm
Diameter 380 mm
Sales unit 1 item
6 items per pallet
120 x 80 x 14 cm

18 KG STEEL LID BARREL

Height 375 mm
Diameter 312 mm
Sales unit 1 item
33 items per pallet
120 x 80 x 14 cm

5 KG PLASTIC BUCKET

Height 259 mm
Diameter 220 mm
Sales unit 1 carton
4 items per carton
Carton (L x B x H): 41 x 41 x 28
20 cartons per pallet
80 items per pallet
120 x 80 x 14 cm

400 GR GREASE CARTRIDGE

Height 240 mm
Diameter 52 mm
Sales unit 1 carton
12 items per carton
Carton (L x B x H): 23 x 17 x 25 cm
Cartons/pallet 80
Items/pallet 960
120 x 80 x 14 cm

PACKAGING DATA

PRODUCT NAME	PRODUCT NUMBER	180KG BARREL	50KG HOBBOCK	18KG BUCKET	5KG BUCKET	400G CARTRIDGE
LUKOIL SIGNUM AX 1	589572	✔	✔		✔	✔
LUKOIL SIGNUM CSXP 2-220	589540		✔	✔		✔
LUKOIL SIGNUM C 2-100	589750	✔				
LUKOIL SIGNUM SYNTH LXP 2-220	589530		✔	✔		✔
LUKOIL SIGNUM LXP 2-220	589525	✔	✔	✔	✔	✔
LUKOIL SIGNUM M284	589760	✔				
LUKOIL SIGNUM M283	589770	✔	✔			
LUKOIL SIGNUM EPC 00	589780		✔	✔	✔	
LUKOIL SIGNUM LPM 2-160	589515	✔	✔	✔	✔	✔
LUKOIL SIGNUM LP 00-150	589510	✔	✔	✔	✔	
LUKOIL SIGNUM LP 1-150	589511		✔	✔		
LUKOIL SIGNUM LP 2-150	589512	✔	✔	✔	✔	✔
LUKOIL SIGNUM LP 3-150	589513		✔	✔		
LUKOIL SIGNUM EPC 000 320	589785	✔	✔			
LUKOIL SIGNUM L 2-150	589508	✔	✔	✔	✔	✔
LUKOIL SIGNUM BIO LP 2-320	589545		✔			

LUKOIL LUBRICANTS EUROPE GmbH

1220 Vienna, Uferstrasse 8
www.lukoil-lubricants.eu
Version: 1.0, February 2022

FOR FURTHER INFORMATION, PLEASE CONTACT THE FOLLOWING:

AUSTRIA
Automotive Telephone 0810 959 8884
info.schmierstoffe-automotive@eu.lukoil.com
Industry: Telephone 0810 959 8886
info.schmierstoffe-industry@eu.lukoil.com
Dealer: Telephone 0810 959 8885
info.schmierstoffe-dealer@eu.lukoil.com

GERMANY
Automotive Telephone 01806 06 00 004
info.schmierstoffe-automotive@eu.lukoil.com
Industry: Telephone 01806 06 00 006
info.schmierstoffe-industry@eu.lukoil.com
Dealer: Telephone 01806 06 00 005
info.schmierstoffe-dealer@eu.lukoil.com

TECHNICAL INFORMATION
www.lukhelp.com

CZECH REPUBLIC
Telephone 844 900 033
info.lubes-CEE@eu.lukoil.com

HUNGARY
Telephone 0680 980 975
info.lubes-CEE@eu.lukoil.com

SLOVAKIA
Telephone 0850 166 670
info.lubes-CEE@eu.lukoil.com

ITALY
Telephone +43 1 205 222 8007
info.lubes-CEE@eu.lukoil.com

NORDIC
Telephone +46 (0)8 466 88 60
order.se@eu.lukoil.com

LUKOIL

WWW.LUKOIL-LUBRICANTS.EU