ADDINOL®

THE ART OF OIL • SINCE 1936

ADDINOL High-performance greases and pastes – Experts and all-rounder

Including optimized PLUS greases!

MORE THAN 80 YEARS

GERMAN QUALITY

ADDINOL – German Quality since 1936
Solutions for all lubrication-related challenges

ADDINOL is one of the few companies in the German mineral oil industry acting independently of any large business group and has distributor partners on all continents in more than 90 countries. Our high-performance lubricants are design elements reflecting the most recent state-of the-art. Development and production are carried out according to latest standards at the chemical site in Leuna in the heart of Germany. Our lubricants reveal their full performance in symbiosis with engines, drives, chains, bearings and hydraulic systems.

ADDINOL provides intelligent solutions which guarantee optimum lubrication and ensure responsibility towards the environment at the same time. Many of our high-performance lubricants increase energy efficiency of plants and engines considerably. They achieve significantly longer drain intervals compared to conventional products and extend the service life of the components lubricated.

ADDINOL – Improve the Performance!

Then and now – Research and development make up a vital part of the company's core competence.

ADDINOL High-performance greases and pastes – A wide variety of power

ADDINOL high-performance lubricating greases and pastes ensure both trouble-free run and operational plant safety. They protect against contaminants and corrosion, absorb impact loads and secure long component lifetimes.

Partially, they work under difficult conditions, such as extreme temperatures, strong dust exposure or humidity. ADDINOL offers for nearly all applications the perfectly fitting product – carefully composed and based on selected oils combined with powerful additives.

Against the background of increasing requirements in practice the ADDINOL product range was extended by a series of new greases with optimised formulations thanks to targeted development work: the ADDINOL PLUS greases. The greases based on polyurea, PTFE or lithium special soap are characterised by improved technical parameters and extraordinarily high quality of the base oils and additive technologies used. They achieve higher performance, increase the efficiency of the plants and are versatile in use.

- ✓ **Multi-purpose greases with and without addition of solid lubricants**
- ✓ **Liquid greases with and without addition of solid lubricants**
- ✓ **Greases for high-speed bearings and low-temperature applications**
- ✓ **Synthetic greases for high temperature applications**
- ✓ **Greases for special applications**
- ✓ **Greases for food industry**
- ✓ **Quickly biodegradable greases**
- ✓ **Pastes**

ADDINOL Lubricating Greases

ADDINOL Product	Thickener	Base oil type	NLGI grade	Base oil viscosity at 40 °C	Application temperature (min/max)	Specifications	DIN classification / Product description
Multi-purpose greases without addition of solid lubricants							
Multi-purpose grease L 2	Li-soap	Mineral oil	2	110 mm²/s	-30°C / +120°C	Hans Lingl Anlagenbau und Verfahrenstechnik GmbH & Co. KG, Maschinenbau Scholz GmbH & Co. KG. Meets: MB 267.0	L 2: K2K-30 L 3: K3K-30 Multi-purpose grease without EP-additives for industry, motor vehicles, construction and agricultural machinery at moderate operating conditions, very water resistant.
Multi-purpose grease L 3	Li-soap	Mineral oil	3	110 mm²/s	-30°C / +120°C	Brückner Maschinenbau GmbH & Co. KG, Hans Lingl Anlagenbau und Verfahrens-technik GmbH & Co. KG	
EP Multi-grade grease LM 1 EP	Li-soap	Mineral oil	1	195 mm²/s	-30°C / +130°C		LM 1 EP: KP1K-30 LM 2 EP: KP2K-30 LM 3 EP: KP3K-30 Multi-purpose grease with EP-additives for the lubricaion of roller and sliding bearings, also under heavy pressure loads, very ageing resistant.
EP Multi-grade grease LM 2 EP	Li-soap	Mineral oil	2	110 mm²/s	-30°C / +130°C	Brückner Maschinenbau GmbH & Co. KG, Waltec Maschinen GmbH, Hans Lingl Anlagenbau und Verfahrenstechnik GmbH & Co. KG. Meets: MAN 283 Li-P2, MB 267.0	
EP Multi-grade grease LM 3 EP	Li-soap	Mineral oil	3	115 mm²/s	-30°C / +130°C		
Multi-grade grease CS 1 EP	Ca-complex	Mineral oil	1-2	150 mm²/s	-30°C / +140°C		KP1-2N-30 Multi-purpose grease with EP-additives for the lubrication of heavy loaded roller and sliding bearings. High water resistance, excellent corrosion protection and good feedability in central lubrication systems. Highly fit for mining and steel industry. Univseral grease for lubrication of motorcars.
Hightemp EK 2	Li-complex	Mineral oil	2	170 mm²/s	-30°C / +150°C	Brückner Maschinenbau GmbH & Co. KG, Waltec Maschinen GmbH, Hans Lingl Anlagenbau und Verfahrenstechnik GmbH & Co. KG. Meets: MAN 284 Li-H2, MB 265.1, Volvo STD 1277,18/1277,2	KP2P-30 Multi-purpose grease with EP-additives for the lubrication of roller and sliding bearings, also at high and/or impact loads and high temperatures. Fit for wheel bearing lubrication in commercial vehicles and passenger cars.
Addilith EP 2	Li-soap	Mineral oil	2	200 mm²/s	-30°C / +130°C	MAN 283 Li-P2, MB 267.0, Volvo STD 1277, 18	KP2K-30 Multi-purpose grease with EP-additives for the lubrication of roller and sliding bearings, also under high and/or impact loads as well as vibrations. Fit for central lubrication systems.

ADDINOL Product	Thickener	Base oil type	NLGI grade	Base oil viscosity at 40 °C	Application temperature (min/max)	Specifications	DIN classification / Product description
Wear Protect RS 2	Ca-sulfonate-complex	Mineral oil	1-2	220 mm²/s	-30°C / +180°C		KP1-2R-30 Temperature-stable multi-purpose grease with high load bearing capacity, high water resistance and excellent corrosion protection. Ideal for unfavourable ambient conditions such as acids, lyes and humidity.
Longlife Grease HP 2	Li-Ca-soap	Mineral oil	2	400 mm²/s	-25°C / +140°C		KP2N-20 Multi-purpose grease with EP-additives for the lubrication of roller and sliding bearings under high and/or impact loads, also under the impact of humidity, long-term lubrication.
Wear Protect SDE 2	Ca-soap	Semisynthetic	2	800 mm²/s	-30°C / +120°C		KP2K-30 Heavy-duty grease with exceptional adhesiveness, very high water resistance and excellent corrosion protection, high pressure-absorption capacity.
Combiplex OG 05	Li-Ca-complex	Mineral oil	0-1	800 mm²/s	-30°C / +140°C		KPGOG0-1N-30 Ideal for highly pressure loaded roller and sliding bearings at increased bearing temperatures, water resistant. Fit for offshore use.
Multi-purpose greases with addition of solid lubricants							
Multi-purpose grease L 2 G	Li-soap	Mineral oil	2	110 mm²/s	-30°C / +120°C		KF2K-30 Graphite-containing multi-purpose grease with good emergency lubricating properties for industry, motorcars, construction and agricultural machinery, highly ageing resistant.
Multi-purpose grease L 2 MO	Li-soap	Mineral oil	2	155 mm²/s	-30°C / +130°C		KPF2K-30 Multi-purpose grease with EP-additives for the lubrication of roller and sliding bearings, also under high pressure loads. Running-in and smoothing aid for new bearings. Contains combination of solid lubricants graphite and MoS_2.
Wear Protect RS 2 MO	Ca-sulfonate-complex	Mineral oil	1-2	220 mm²/s	-30°C / +180°C		KPF1-2R-30 Highly fit for the lubrication of heavy loaded roller and sliding bearings at unfavourable ambient conditions such as acids, lyes and humidity. For calender, rolls, construction machinery, pumps, driers and washing machines as well as engines in all industrial sectors, in shipping and mining. Contains MoS_2.
Additemp BG 1	Bentonite	Mineral oil	1	500 mm²/s	-15°C / +160°C		OGPF1P-10 Graphite-containing heavy-duty grease based on anorganic thickener. High pressure absorption capacity, outstanding adhesion and excellent water resistance. Suited for the lubrication of guide rails, slideways and open gear drives.
Grease EP 2 G	Li-soap	Semisynthetic	2	800 mm²/s	-30°C / +140°C		KPF2N-30 Graphite-containing heavy-duty grease for the lubrication of motorcars, industrial plants and all bearings under extremely high loads, very water resistant, ageing stable, suited for central lubrication systems.
Longlife Grease MG 1	Li-complex	Mineral oil	1	1.500 mm²/s	-15°C / +150°C		KPF1N-10 Lubrication of slowly running, large roller bearings for instance at roller presses, rotary kilns, rotation breakers, bowl mills. Contains graphite and MoS_2.

ADDINOL Product	Thickener	Base oil type	NLGI grade	Base oil viscosity at 40 °C	Application temperature (min/max)	Specifications	DIN classification / Product description
Liquid greases without addition of solid lubricants							
Ropeshield DF	Ca-complex	Mineral oil	0	100 mm²/s	-30°C / +150°C		Corrosion protection grease for the lubrication and preservation of steel and steel-aluminium cables. Protective grease for electrical cable systems. High water resistance.
Liquid grease SGA 600	Na-soap	Mineral oil	0	140 mm²/s	-30°C / +100°C		GP0H-30 Long-fibred fluid grease for gears with EP additives. Very good adhesion. Not suitable for applications under the influence of water. For normally loaded, closed gears.
Addilith EP 0	Li-soap	Mineral oil	0	90 mm²/s	-40°C / +120°C	MAN 283 Li-P 0, central lubrication systems of Groeneveld	GP0K-40 Fluid grease with EP additives for use in gear units, geared motors and sealed roller and sliding bearings. Suitable for the lubrication of commercial vehicles.
Liquid grease LPG 00	Li-soap	Polyglycol	00	150 mm²/s	-40°C / +150°C		GPPG00N-40 Liquid grease with EP additives for the lubrication of heavily loaded spur, bevel and worm gears in a wide temperature range. Good adhesion. Suitable for central lubrication systems.
Liquid grease SGR 4-00-9 P	Li-soap	Mineral oil	00	200 mm²/s	-30°C / +120°C	Waltec Maschinen GmbH, Hans Lingl Anlagenbau und Verfahrenstechnik GmbH & Co. KG	GP00K-30 Multi-purpose grease with EP additives for the lubrication of spur, bevel and worm gears. Suited for friction pairings steel/steel. Water resistant.
Liquid grease LIC 000	Li-soap	Mineral oil	00 - 000	45 mm²/s	-50°C / +120°C	bielomatik LEUZE GmbH. Meets: MAN 283 Li-P00, MB 264.0, MB DBL 6833.00	GP00-000K-50 Liquid grease with EP additives. Suited in particular for central lubrication systems in commercial vehicles. Highly water resistant.
Liquid greases with addition of solid lubricants							
Adhesive lubricant OG 0	Al-complex	Mineral oil	0	1.000 mm²/s	-20°C / +200°C	Hans Lingl Anlagenbau und Verfahrenstechnik GmbH & Co. KG	OGPF0S-20 Graphite-containing liquid grease with high pressure absorpton capacity, excellent water resistance and very good adhesiveness. Sprayable. For large open toothed gears in cement tube mills, cement kilns, crane systems and heavy construction machinery.
Combiplex OG 0-2500	Al-complex	Semisynthetic	0	2.500 mm²/s	-20°C / +200°C	Hans Lingl Anlagenbau und Verfahrenstechnik GmbH & Co. KG	OGPF0S-20 Graphit-containing liquid grease with excellent emergency running properties, very water resistant and adhesive. Suited for automatic spray lubrication of open gears, gear rims and gear racks in heavy-duty operation.
Greases for high-speed bearings and low-temperature applications							
Arctic Grease XP 2	Ca-soap	Mineral oil	2	14 mm²/s	-50°C / +100°C	Brückner Maschinenbau GmbH & Co. KG	K2G-50 Low-temperature grease with low starting resistance. Also suited for the lubrication of high-speed bearings at moderate loads and operating temperatures.
Longlife Grease HS 2	Li-complex	PAO	2	27 mm²/s	-60°C / +140°C	Hans Lingl Anlagenbau und Verfahrenstechnik GmbH & Co. KG	KPHC2N-60 Synthetic low-temperature grease with EP-additives and low starting resistance. Also suited for the lubrcation of fast rotating bearings, as for instance at linear drives, machine tools and textile machinery.
Multiplex XMK 2	Li-Ca-soap	PAO	2	32 mm²/s	-50°C / +140°C	VW-TL 778 A	KHC2N-50 Synthetic low-temperature grease with low starting resistance. Perfectly fit for the long-term lubrication of design elements containing material pairings metal/plastics or plastics/plastics, e.g. central locking systems, window regulators or sunroofs of vehicles.
Synthetic greases for high temperature applications							
Wear Protect RS 2 Syn PLUS	Polyurea	PAO/Ester	2	100 mm²/s	-40°C / +180°C	Brückner Maschinenbau GmbH & Co. KG	KPHC2R-40 For high temperatures, water impact, varying loads and high speeds. Ideal for bearing lubrication of electric motors, ventilators, conveyor belts, generators, air conditioning units, rinsing and washing machines, textile machinery, drying units at paper machinery et al.
Hightemp XFT 2 PLUS	Polyurea	PAO/Ester	1-2	460 mm²/s	-30°C / +180°C	Brückner Maschinenbau GmbH & Co. KG, Waltec Maschinen GmbH	KPHC1-2R-30 For high temperatures and loads as well as low rotation speed, bearings at annealing and drying kilns, rotary furnaces, exhaust gas and hot blast fans, conveyor and lacquering units as well as baking ovens and fan bearings under high temperature loads.

ADDINOL Product	Thickener	Base oil type	NLGI grade	Base oil viscosity at 40 °C	Application temperature (min/max)	Specifications	DIN classification / Product description
Hightemp HF 2 PLUS	Special thickener	Synthetic oil mixture	2-3	450 mm²/s	-20°C / +200°C	Brückner Maschinenbau GmbH & Co. KG	KFKHC2-3S-20 High-temperature grease for the long-term lubrication of slow-running roller and sliding bearings, sliding rails and friction pairings with high wear potential. Very good resistance towards water, acids and lyes. High pressure, temperature and shear stability.
Addiflon Super 2 EP PLUS	PTFE	PFPE	2	190 mm²/s	-50°C / +260°C	Brückner Maschinenbau GmbH & Co. KG	KPFK2U-50 Very high load carrying capacity, excellent corrosion protection properties, best oxidation stability and media resistance. Can be used in thermally highly loaded sliding and roller bearings, rollers of conveyor systems, in drying, lacquering and enameling furnaces, in tunnel furnace systems, rotary heads etc.
Addiflon PFPE Premium XH 1 PLUS	PTFE	PFPE	1	420 mm²/s	-40°C / +280°C		KFK1U-40 Ideal for roller and sliding bearings exposed to high thermal loads, e.g. in conveyor systems, furnaces, dry-running compressors, also suitable for roller bearings of corrugating rolls in corrugated paper plants. High load carrying capacity, best corrosion protection, very stable against oxidation and media.
Addiflon PFPE Premium XH 2 PLUS	PTFE	PFPE	2	420 mm²/s	-40°C / +280°C	Brückner Maschinenbau GmbH & Co. KG	KFK2U-40 Suitable for long-term and boundary lubrication. Highest load carrying capacity and excellent corrosion protection. For use in conveyor systems, furnaces, dry-running compressors, also suitable for all types of fittings and in rubber and plastics industry. Very stable against oxidation and media.
Greases for special applications							
Contact Grease EL-K3	Ca-soap	Mineral oil	3	32 mm²/s	-30°C / +80°C		M3E-30 Very water-resistant grease with good corrosion protection properties for the protection of copper-containing contact materials under the influence of moisture at moderate temperatures.
Anti-Corrosion Grease SW 2	Ca-soap	Mineral oil	1-2	100 mm²/s	-25°C / +80°C	Meets: BW-TL 91050-0066, Defence Standard 91-34/1, NATO G 460, STM 7420/B	KP1-2E-25 Very water-resistant grease with EP additives and excellent corrosion protection, even when exposed to salt water. Versatile use e.g. for the lubrication of winches, screws, hinges, threaded spindles and other components on off-shore plants, shipyards, yachts, locks, car washes etc.
Eco Grease PD 2-120 PLUS	Li-soap	Mineral oil	2	120 mm²/s	-35°C / +140°C	Brückner Maschinenbau GmbH & Co. KG	KP2N-35 For extreme pressures, strong vibrations, shock-like loads and temperature variation. Highly suitable for generator bearings (wind power), heavy loaded roller bearings and gears, geared motors, robots and printing plates. Achieves very low friction coefficient and optimum wear protection.
Eco Grease PD 2-400 PLUS	Li-Special soap	Synthetic oil mixture	2	400 mm²/s	-40°C / +160°C		KPHC2P-40 Long-life grease for extreme pressures, strong vibrations, shock loads and temperature variation. Ideally suited for main bearings (wind power) and highly loaded, slow-running bearings of all industrial sectors.
Eco Grease A 2-500	Li-Ca-complex	Mineral oil	2	500 mm²/s	-20°C / +140°C		GOG2N-20 For the long-term lubrication of roller and sliding bearings under extreme conditions in automotive and industrial applications. Even under humid conditions and changing ambient temperatures. Suitable for central lubrication systems.

ADDINOL Product	Thickener	Base oil type	NLGI grade	Base oil viscosity at 40 °C	Application temperature (min/max)	Specifications	DIN classification / Product description
Granule Grease 2 PLUS	Li-Ca-soap	Mineral oil	2	415 mm²/s	-25°C / +150°C		Granule Grease 2 PLUS: KP2N-20 Granule Grease HT 2: KP1-2P-10 Heavy-duty grease for the lubrication of roller and sliding bearings under high and/or shock loads, also under the influence of moisture and increased temperatures. Suitable for use in central lubrication systems. Among other things used for the lubrication of roller bearings in wood pellet presses.
Granule Grease HT 2	Li-complex	Mineral oil	1-2	500 mm²/s	-15°C / +160°C		
Addisil Extemp 2	Li-soap	Silicone oil	2	75 mm²/s	-50°C / +180°C	Hans Lingl Anlagenbau und Verfahrenstechnik GmbH & Co. KG, Maschinenbau Scholz GmbH & Co. KG. Meets: VW-TL 767 X, Bosch RBIN-Standard: N28 F 002 S3F A06	KSI2R-50 Preferably used for long-term and permanent lubrication of material combinations such as steel/bronze, aluminium, chrome and plastic at high and low temperatures and light to medium pressure loads. Also suitable for optical and precision mechanical devices, consumer electronics equipment and automotive accessories. Can be used as separating and lubricating agent as well as sealing grease. Very water resistant.
Greases for food industry							
Multiplex FD 2	Al-complex	Medical white oil	2	160 mm²/s	-20°C / +140°C	NSF H1, Halal, Kosher FDA Guideline 21 CFR 178.3570	K2N-20 Multi-purpose grease without EP-additivation with excellent water resistance. Lubrication of roller and sliding bearings in food, feed and packaging industry.
FG Grease AL 00	Al-complex	PAO	00	350 mm²/s	-45°C / +160°C	NSF H1, Halal, Kosher, FDA Guideline 21 CFR 178.3570	GPFHC00P-40 Synthetic fluid grease with EP additivation, excellent water resistance and wide temperature range. Lubrication of roller and sliding bearings in food, feed and packaging industry.
FG Grease AL 1	Al-complex	PAO	1	350 mm²/s	-45°C / +160°C	NSF H1, Halal, Kosher, FDA Guideline 21 CFR 178.3570	FG Grease AL 1: KPFHC1P-40 FG Grease AL 2: KPFHC2P-40 Synthetic grease with EP additivation. Suitable for the lubrication of roller and sliding bearings in food, feed and packaging industries. Very water resistant. Suitable for high loads and wide temperature range.
FG Grease AL 2	Al-complex	PAO	2	350 mm²/s	-45°C / +160°C	NSF H1, Halal, Kosher, FDA Richtlinie 21 CFR 178.3570	
Addiflon PFPE Premium FD 2 PLUS	PTFE	PFPE	2	500 mm²/s	-30°C / +285°C	Brückner Maschinenbau GmbH & Co. KG, NSF H1 registered, FDA Guideline 21 CFR 178.3570	KFK2U-30 Thermally highly loaded sliding and roller bearings in food production and the pharmaceutical industry. Use in baking machines, baking lines, oven cars, calenders, guide rollers of transport chains, etc.
Addisil FG 23	PTFE	Silicone oil	2-3	850 mm²/s	-45°C / +200°C	NSF H1 meets FDA purity requirements of guideline 21 CFR 178.3570	MSI2-3S-40 Synthetic silicone grease with high thermal and chemical resistance. Suitable for lubrication of fittings, plug valves, seals and sleeves in brewery, beverage and pharmaceutical industries. Very good elastomer compatibility, including EPDM, NBR and FKM.
Quickly biodegradable greases							
Ecosynth Flange Grease	Li-soap	Ester	00 - 000	50 mm²/s	-30°C / +80°C	REBS Zentralschmiertechnik GmbH	MPE00-000E-30 Liquid grease free of solid lubricants for wheel flange lubrication in stationary and mobile lubrication systems. Suitable for sliding surfaces and guides on construction machinery, forest and forestry equipment.
Ecosynth Flange Grease G	Ca-soap	Ester	000	25 mm²/s	-30°C / +80°C	REBS Zentralschmiertechnik GmbH	MFE000E-30 Fluid grease containing graphite for the wheel flange lubrication of rail vehicles. Lubrication of sliding surfaces on switches, traction and pushing devices.
Ecoplus CA 2	Ca-soap	Rapeseed oil	2	36 mm²/s	-20°C / +80°C		KE2E-20 Rapidly biodegradable lubricating grease based on vegetable oil for roller and sliding bearings and sliding surfaces under normal loads. Suitable as lubricating grease. Very adhesive and water resistant.
Ecosynth Super 2 LE	Li-soap	Ester	2	100 mm²/s	-35°C / +120°C		KPE2K-30 Rapidly biodegradable lubricating grease for roller and sliding bearings under high loads, even impact loads. Universally applicable for construction, tool and paper machines as well as in textile industry. Suitable for loss lubrication points. Very adhesive and water resistant.

ADDINOL Pastes

ADDINOL Product	Thickener	Base oil type	NLGI grade	Base oil viscosity at 40 °C	Application temperature (min/max)	Specifications	DIN classification / Product description
Pastes							
Anti-Seize Paste 23 White		PAO	2	32 mm²/s	-60°C / +250°C		MPF2U-60 Silicone-free, white assembly paste based on white solid lubricants. Prevention of tribocorrosion (fretting corrosion) on machine elements subject to vibration stress. Sealant for seals and flanges.
Assembly paste HTP 700 PG		Polyglycol	2	460 mm²/s	-20°C / +200°C (dry lubrication up to +700°C)		MPF2U-20 Universally applicable black paste for the assembly of shaft-hub connections and for the lubrication of hot screw connections. High pressure and high temperature lubricant in mechanical engineering, for slideways, guide rails. Running-in aid for bearings and gears.
Chisel paste	Al-complex	Mineral oil	2	350 mm²/s	-20°C / +1100°C		MF2U-20 High temperature paste with additions of copper powder and graphite. Suitable for the prevention of cold welding, clamping and signs of wear on insert tools and wear bushes. Not suitable for lubrication of roller and sliding bearings.
Anti-Seize Paste GAL	Li-soap	Semisynthetic	1	220 mm²/s	-20°C / +1200°C		MLPF1U-20 High temperature paste with additions of finely dispersed non-ferrous metals. Can be used as screwing, assembly and release agent, e.g. in mechanical engineering, steel and rolling mills, power stations and mining. Not suitable for lubrication of roller and sliding bearings.
Addiflon White 2 Paste PLUS	PTFE	Ester/PAO	2	2.500 mm²/s	-35°C / +150°C		MLEHC2N-35 Adhesive multi-purpose paste for sliding machine components made of metal, plastic and ceramic. Well suited for cold and hot water fittings, plug taps etc., noise-reducing.
Drawing Lube 35		Ester					Mineral oil free, water-soluble paste for drawing surface-treated (phosphated, limed, galvanised, copper-plated or dry drawn) steel wires.

Lubricating greases and pastes – Basics and practical tips

Composition of lubricating greases

Lubricating greases are semi-fluid to solid lubricants manufactured by combining a suited thickener and a liquid base oil. Both type of thickener and type as well as viscosity of the base oil used determine the performance parameters of the resulting lubricating greases. Certain characteristics can be improved by introducing selected additives and also solid lubricants.

Typical lubricating greases contain 70-95 % base oil, 3-30 % thickener and 0-10 % additives. If solid lubricants are contained, their share does not exceed 10 %.

The lubricating and the usage properties of greases chiefly are determined by the **base oils** as their main components. The temperature range for the application is defined by the thermal-oxidative stability and the pour point of the base oil. Viscosity and viscosity-temperature-behaviour of the base oil decide on the formation of load-bearing lubricating films and the greases' torque behaviour. Moreover, the base oil chosen influences the elastomer compatibility. Base oils can be mineral oils (paraffinic oils, naphthenic oils, white oils), synthetic oils (poly-alpha-olefines, ester, polyalkylene glycols, silicone oils, perfluoropolyether) or vegetable oils. When mixtures of mineral and synthetic base oils are used, you will get semi-synthetic products.

Thickeners influence resistance towards media (water, solvents), mechanical stability, interface properties, thermal stability as well as consistency of the greases. They are classified into metal soaps (e.g. lithium, natrium, calcium, aluminium) and non-metal soaps (organic or inorganic). A thickener can be based on a single soap or a combination of two of them. In addition, a thickener can be structured as a complex soap. The selection of the particular soap depends on the respective application.

Additives boost existing characteristics of the lubricating greases or provide them with further properties. The following additives are being used:

- EP-additives, which improve load capacity and protect against wear and surface damages when exposed to pressure loads
- corrosion and rust inhibitors
- anti-oxidants for improving ageing stability
- additives for improving adhesiveness
- water-repellents to reinforce water resistance.

Solid lubricants are added to greases operating under extremely heavy conditions and/or where emergency running properties are required. Here, graphite and molybdenum disulphide (MoS_2) as well as soft metals, such as aluminium or copper, are being used; PTFE (teflon) is another possible component.

Pastes – a particular case

Pastes are mixtures of base oils or greases containing more than 40 % solid lubricant. They are being applied at components which do not move at all or which move at very low speed only. Where extreme pressures and very high temperatures occur, pastes are the number one choice for lubricating and separating the components.

Application of lubricating greases

Usually, lubricating greases are used where lubrication points cannot be supplied with oil because their sealing would be difficult or costly.

Lubricating greases ensure the trouble-free run and the plants operating safety. They protect against contaminants and corrosion, absorb impact loads and secure long component lifetimes. In a sense, the disadvantages of oil lubrication are the advantages of grease lubrication. Lubricating greases possess outstanding sealing properties; achieve an excellent absorption of noise as well as oscillation and are economical in consumption. However, they are not suited for temperature dissipation and do not remove dirt and wear particles from the point of lubrication.

Identification of lubricating greases

Lubricating greases can be classified according to the **DIN-Specification** (DIN 51 502). – Please see the overview and explanatory examples on page 12.

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Selection of lubricating greases

The selection of a particular lubricating grease for the respective application depends on various factors. On the one hand, the field of application itself and the individual operating conditions such as temperature, rotation speed, loads and lubrication intervals define criteria decisive for selecting. On the other hand, the single characteristic values of the lubricating grease – namely DIN classification, base oil viscosity, used thickener, material compatibility and so on – determine whether a particular grease is fit for the application at hand. Last but not least the lubricating grease used before in the unit influences the available choices as well – greases based on different soaps must not mix! Otherwise, mechanical stability, temperature stability and consistency might be impaired. In each case, the miscibility always depends on the particular product, its components (there might also be an interaction between additives) and the application. Therefore, one cannot make general statements and for specific questions you should contact our experts of application technology.

More than 600 high-performance lubricants – the perfectly fitting product for each application!

Guideline for the classification and labelling of lubricating greases according to DIN 51 502

EP Multi-grade grease LM 1 EP: KP1K-30

- **K** Application: Roller bearings, sliding bearings, slide surfaces
- **P** Useability: With additives for reducing friction and wear and increasing loadability
- **1** NLGI/Consistency grade: 1
- **K** Upper application temperature: +120 °C
- **-30** Lower application temperature: -30 °C

Hightemp XFT 2 PLUS: KPHC1-2R-30

- **K** Application: Roller bearings, sliding bearings, slide surfaces
- **P** Useability: With additives for reducing friction and wear and increasing loadability
- **HC** Synthetic oils: Synthetic hydrocarbons
- **1-2** NLGI/Consistency grade: 1-2
- **R** Upper application temperature: +180 °C
- **-50** Lower application temperature: -30 °C

Code letter application			
K	Roller bearings, sliding bearings, slide surfaces	OG	Open gears and toothings
G	Closed gears	M	Sliding bearings and seals

Additional code letter usability			
F	Solid lubricant additive	P	With additives for reducing friction and wear and increasing loadability
L	With additives for increasing corrosion protection and/or ageing resistance		

Additional code letter for synthetic oils			
E	Organic esters	PH	Phosphoric ester
FK	Perfluorinated oils	SI	Silicone oils
HC	Synthetic hydrocarbons	X	Further
PG	Polyglycoles		

NLGI-Classes	Worked penetration DIN ISO 2137	NLGI-Classes	Worked penetration DIN ISO 2137
000	445-475	3	220-250
00	400-430	4	175-205
0	355-385	5	130-160
1	310-340	6	85-115
2	265-295		

Additional code letter upper application temperature (DIN 51807)			
C	+60°C	N	+140°C
D		P	+160°C
E	+80°C	R	+180°C
F		S	+200°C
G	+100°C	T	+220°C
H		U	> +220°C
K	+120°C		
M			

Lower application temperature

A perfect team – PULSARLUBE lubricators and ADDINOL high-performance greases

The intelligent aids from PULSARLUBE ensure the reliable and continuous lubrication at any time. For almost each application there is a suitable model of the automatic lubricators available. These lubricators provide a cost-saving alternative for manual re-lubrication carried out by using grease guns. To start with, the tried and tested lubricators allow considerable savings regarding working time compared to manual re-lubrication. In addition, possible sources of error involved with manual lubrication, as for instance poor bearing lubrication, can be eliminated.

ADDINOL Lubricating greases in service packs

PULSARLUBE lubricators EX, M and MS are operated with replaceable lubricant service packs. These contain a grease pouch (plastic bag filled with lubricating grease), a spare battery and a dust cover. One service pack is used for one lubrication cycle which might cover different periods depending on the respective application. At the end of a lubrication cycle both pouch and battery must be replaced. This changeover is clean, quick and cost-efficient and ensures the reliable operation at maximum power at any time.

The useful service packs are available for many ADDINOL lubricating greases. There is also the possibility to order non-refillable systems V and E for single use. Mounting angles, progressive distributors, feed pipes and reducing pieces matching the PULSARLUBE units and the ADDINOL service packs can be obtained from ADDINOL as well. Various ready-made assembly kits allow an easy selection of the required accessories depending on the application at hand. A full description of all assembly kits available can be found in the “Installation Guide” for PULSARLUBE units. You can contact the ADDINOL application technology for obtaining this brochure as well as detailed information on the single lubricator types.

Extra tip: Upon request, we can supply other ADDINOL greases in pouches if a minimum quantity is achieved. Please keep in mind that only greases up to NLGI grade 2 can be reliably pumped with the lubricators described.

PULSARLUBE systems in the ADDINOL range

PULSARLUBE System	Refillable with	Lubricant reservoir	Lubrication points per unit	Remarks
EX	service pack	250 ml	1	battery operated programmable timer ATEX certified
M	service pack	250 ml 500 ml	1-8	battery operated programmable timer
MS	service pack	250 ml	1-8	battery operated programmable timer can be synchronised with the machine
V / E	for single use	250 ml	1	battery operated programmable timer

ADDINOL High-Performance Greases in service pouches

ADDINOL Grease	250 ml	500 ml
EP Multi-grade grease LM 2 EP	✓	✓
Multi-purpose Grease L 2 MO	✓	
Longlife Grease HS 2	✓	
Longlife Grease HP 2	✓	
Hightemp EK 2	✓	
Ecoplus CA 2	✓	
Multiplex FD 2	✓	
FG Grease AL 1	✓	
FG Grease AL 2	✓	

ADDINOL®

THE ART OF OIL • SINCE 1936

ADDINOL high-performance lubricants in more than 90 countries and on all continents.

handed over by:

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