

# ***ADDINOL***<sup>®</sup>

THE ART OF OIL • SINCE 1936

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





## ➤ **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.

- ✓ **Greases for roller and sliding bearings without EP additivation**
- ✓ **Greases for roller and sliding bearings with EP additivation**
- ✓ **Heavy duty greases**
- ✓ **Low-temperature greases**
- ✓ **Low-viscosity greases and adhesive lubricants**
- ✓ **Anti-corrosion and contact greases**
- ✓ **Inert greases**
- ✓ **Hybrid greases**
- ✓ **Silicone greases**
- ✓ **Lubricating greases for food industry**
- ✓ **Biodegradable greases**
- ✓ **Pastes**





## ➤ ADDINOL Lubricating Greases

ADDINOL Product Classification acc. to DIN 51 502	Thickener Base oil type Solid lubricants	NLGI Grade	Base oil viscosity at 40°C in mm²/s	Application temperature in °C	Approvals Specifications	Characteristics
Roller and sliding bearing greases without EP additivation						
Multi-purpose grease L 2 K2K-30	Lithium soap Mineral oil -	2	110	-30 up to +120 (short-term up to +130)	Hans Lingl Anlagenbau und Verfahrenstechnik GmbH & Co. KG, Maschinenbau Scholz GmbH & Co. KG. Meets: MB 267.0	Universal greases for vehicles, construction industry and agriculture under dusty and humid conditions
Multi-purpose grease L 2 G KF2K-30	Lithium soap Mineral oil Graphite	2	110	-30 up to +120 (short-term up to +130)		
Multi-purpose grease L 3 K3K-30	Lithium soap Mineral oil -	3	100	-30 up to +120	Brückner Maschinenbau GmbH & Co. KG, Hans Lingl Anlagenbau und Verfahrens- technik GmbH & Co. KG	
Roller and sliding bearing greases with EP additivation						
Longlife Grease HP 1 KP1N-30	Lithium soap Mineral oil -	1	180	-30 up to +140	Waltec Maschinen GmbH	Long-term grease for high loads, ideal for low up to medium rotation speed as well as medium to heightened temperatures, ideal for applications at roller bearings, highly suited for water impact
EP Multi-grade grease LM 1 EP KP1K-30	Lithium soap Mineral oil -	1	195	-30 up to +130 (short-term up to +140)		EP universal grease for bearings, vehicles, industry, construction industry
Multi-grade grease CS 1 EP KP1-2N-30	Calcium complex soap Mineral oil -	1-2	150	-30 up to +140 (short-term up to +180)		Long-term lubrication of working rolls in hot rolling mills, paper mills and blast furnaces; highly water resistant
Wear Protect RS 2 Syn KPHC2R-40	Polyurea Synthetic oil -	2	100	-40 up to +180 (short-term up to +200)	Brückner Maschinenbau GmbH & Co. KG	For unfavourable ambient conditions such as acids, lyes and humidity, highly fit for calender, rolls, construction machinery, pumps, dryers and washers, engines in all industrial sectors, in shipping and in mining
EP Multi-grade grease LM 2 EP KP2K-30	Lithium soap Mineral oil -	2	110	-30 up to +130 (short-term up to +140)	Brückner Maschinenbau GmbH & Co. KG, Waltec Maschinen GmbH, Hans Lingl Anlagenbau und Verfahrens- technik GmbH & Co. KG. Meets: MAN 283 Li-P2, MB 267.0	Universal grease for bearings; usage in vehicles, industry, construction industry



ADDINOL Product Classification acc. to DIN 51 502	Thickener Base oil type Solid lubricants	NLGI Grade	Base oil viscosity at 40°C in mm <sup>2</sup> /s	Application temperature in °C	Approvals Specifications	Characteristics
<b>Roller and sliding bearing greases with EP additivation</b>						
Eco Grease PD 2-120 KP2N-35	Lithium soap Mineral oil -	2	120	-35 up to +140	Brückner Maschinenbau GmbH & Co. KG	For extreme pressures, strong oscillation, impact loads and temperature variation, perfectly fit for generator bearings (wind turbines), roller bearings under heavy loads, gears, gear engines, drive motors, robots and thrust plates
Multi-grade grease CS 2 EP KP2N-20	Calcium complex soap Mineral oil -	2	150	-25 up to +140		Mining and steel industry, vehicle lubrication, suited for central lubrication systems, highly water resistant
Multi-purpose grease L 2 M0 KPF2K-30	Lithium soap Mineral oil Graphite + MoS <sub>2</sub>	2	155	-30 up to +130 (short-term up to +140)		Lubrication of bearings and heavy loaded lube points, vehicle lubrication, running-in and smoothing aid for new bearings
Hightemp EK 2 KP2P-30	Lithium complex soap Mineral oil -	2	170	-30 up to +150 (short-term up to +200)	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	EP grease for bearings under high pressure loads, wheel bearing lubrication for cars and commercial vehicles
Wear Protect RS 2 KP2P-30	Calcium complex soap Mineral oil -	2	180	-30 up to +150 (short-term up to +180)		For high temperatures, water impact, varying loads and high speeds, ideal for bearing lubrication at electric motors, fans, conveyor belts, generators, air conditioners, rinsing and washing machines, textile machinery, drying units at paper machines and further
Wear Protect RS 2 M0 KPF2P-30	Calcium complex soap Mineral oil MoS <sub>2</sub>	2	180	-30 up to +150 (short-term up to +180)		For unfavourable ambient conditions such as acids, lyes and humidity, highly fit for calender, rolls, construction machinery, pumps, dryers and washers, engines in all industrial sectors, in shipping and in mining
Longlife Grease KP 2 K-SEB KP2K-30	Lithium soap Mineral oil -	2	190	-30 up to +130 (short-term up to +160)	Meets: SEB 181 253 of VDEh	Long-term grease for bearings under high mechanical impact loads and exposed to humidity, especially for work roll and supporting roll bearings in hot and cold rolling mills, also in hot and cold shearing lines
Wear Protect HTP 2 M0 KPF2K-30	Lithium soap Mineral oil MoS <sub>2</sub>	2	195	-30 up to +130 (short-term up to +140)		For high and very high loads and impact loads respectively, oscillating movements, ideal for construction and agricultural machinery under dusty and humid conditions as well as application under high water impact, perfectly fit for guides and threaded spindles, joints, bearings as well as chassis lubrication
EP Multi-grade grease LM 3 EP KP3K-30	Lithium soap Mineral oil -	3	115	-30 up to +130 (short-term up to +140)		Universal grease for bearings; usage in vehicles, industry, construction industry



MoS<sub>2</sub> – Molybdenum disulphide



ADDINOL Product Classification acc. to DIN 51 502	Thickener Base oil type Solid lubricants	NLGI Grade	Base oil viscosity at 40°C in mm <sup>2</sup> /s	Application temperature in °C	Approvals Specifications	Characteristics
Heavy duty greases						
Hightemp XFT 2 KPHC1-2R-30	Polyurea Synthetic oil -	1-2	460	-30 up to +180 (short-term up to +200)	Brückner Maschinenbau GmbH & Co. KG, Waltec Maschinen GmbH, Hans Lingl Anlagenbau und Verfahrenstechnik GmbH & Co. KG, Dieffenbacher GmbH	For high temperatures and loads and low rotation speed, bearings under high temperatures at annealing and drying furnaces, rotary kilns, hot-air and exhaust fans, conveyor and enamelling units as well as ovens and fans
Granule Grease HT 2 KP1-2P-10	Lithium complex soap Mineral oil -	1-2	500	-15 up to +160 (short-term up to +220)		Special grease for bearings in wood pellet presses, ideal for high pressure and impact loads as well as increased temperatures
Eco Grease PD 2-400 KPHC2R-35	Lithium complex soap Synthetic oil blend -	2	400	-38 up to +180		Long-term grease for extreme pressures, strong vibration, impact loads and varying temperatures, perfectly fit for main bearings (wind turbines) as well as heavy loaded bearings at low speed in all sectors of industry
Longlife Grease HP 2 KP2N-20	Lithium-calcium soap Mineral oil -	2	400	-25 up to +140 (short-term up to +160)	Brückner Maschinenbau GmbH & Co. KG	Long-term grease for high loads, ideal for low to medium rotation speed and medium to heightened temperatures, perfectly fit for strong exposure to water, ideal for applications at roller bearings
Granule Grease 2 Plus KP2N-20	Lithium-calcium soap Mineral oil -	2	415	-25 up to +150 (short-term up to +165)		Special grease for roller bearings in wood pellet presses, ideal for high pressure and impact loads as well as heightened temperatures
Longlife Grease LC 2 KP2P-20	Lithium-calcium complex soap Mineral oil -	2	420	-25 up to +150 (short-term up to +200)		For roller and sliding bearings, suited for Voith Papers
Eco Grease A 2-500 GOGM2N-20	Lithium-calcium complex soap Mineral oil -	2	500	-20 up to +140 (short-term up to +150)		For long-term lubrication of roller and sliding bearings under extreme conditions in automotive and industrial applications, also under humid conditions and at varying ambient temperatures, fit for central lubrication systems
Grease EP 2 G KPF2N-30	Lithium soap Mineral oil + Synthetic oil Graphite	2	800	-30 up to +140 (short-term up to +150)		Long-term grease for vehicle lubrication and industrial applications at extremely high loads
Wear Protect HTP 2 KP2K-20	Lithium-calcium soap Mineral oil -	2	920	-20 up to +120	Maschinenbau Scholz GmbH & Co. KG	Lubrication of heavy loaded bearings under impact pressure loads, highly water resistant, usage in mining and excavation, vessels, drilling rigs and walking units of excavators
Longlife Grease MG 2 KPF2N-25	Lithium complex soap Mineral oil + Synthetic oil Graphite + MoS <sub>2</sub>	2	1000	-25 up to +150 (short-term up to +180)	Dieffenbacher GmbH	EP-Long-term grease for vehicle lubrication and industrial machinery under extremely high loads
Low-temperature greases – Lower application temperature ≤ -50°C						
Arctic Grease XP 2 K2G-50	Calcium soap Mineral oil -	2	14	-50 up to +100	Brückner Maschinenbau GmbH & Co. KG	For high-speed bearings, ideal for applications in cold storage houses
High Speed Grease 2 KPHC2K-50	Lithium complex soap Synthetic oil -	2	26	-50 up to +120 (short-term up to +140)		For high rotation speed and/or low temperatures, e.g. at machine tools and textile machinery, threaded spindles, linear drives, electric motors as well as pinion and small gears
Longlife Grease HS 2 KPHC2N-60	Lithium complex soap Synthetic oil -	2	27	-60 up to +140	Hans Lingl Anlagenbau und Verfahrenstechnik GmbH & Co. KG	Low-temperature grease for bearings under high pressure loads, e.g. units and vehicles in cold storage houses, suited for central lubrication systems
Multiplex XMK 2 KHC2N-50	Lithium-calcium soap PAO -	2	32	-50 up to +140	Meets: VW-TL 778 A	Lubrication of design elements made of metal/plastics and plastics/plastics, e.g. wires, vehicle components, etc.
Addisil Extemp 2 KSI2R-50	Lithium soap Silicone oil -	2	75	-50 up to +180	Hans Lingl Anlagenbau und Verfahrenstechnik GmbH & Co. KG, Maschinenbau Scholz GmbH & Co. KG. Meets: VW-TL 767 X	For long-term and lifetime lubrication of steel/bronze, aluminium, chrome and plastics, separating and sliding agent, sealing grease

ADDINOL Product Classification acc. to DIN 51 502	Thickener Base oil type Solid lubricants	NLGI Grade	Base oil viscosity at 40°C in mm²/s	Application temperature in °C	Approvals Specifications	Characteristics
Low-viscosity greases and adhesive lubricants						
Liquid grease LIC 000 GP00/000K-50	Lithium soap Mineral oil -	00/000	45	-50 up to +120	bielomatik LEUZE GmbH. Meets: MAN 283 Li-P00, MB 264.0, MB DBL 6833.00	For central lubrication systems of commercial vehicles
Liquid grease PG-00 GPPG00K-40	Lithium soap Polyglycol -	00	120	-40 up to +120	Hans Lingl Anlagenbau und Verfahrenstechnik GmbH & Co. KG	Lubrication of heavy loaded spur gear units and worm gear pairs at low temperatures and outdoor conditions, lubrication of open gears
Liquid grease SGR 4-00-9 P GP00K-30	Lithium soap Mineral oil -	00	200	-30 up to +120	Waltec Maschinen GmbH, Hans Lingl Anlagenbau und Verfahrenstechnik GmbH & Co. KG	Liquid grease for spur gear units and bevel gearing with pairings steel/steel
Addilith EP 0 GP0K-40	Lithium soap Mineral oil -	0	90	-40 up to +120 (short-term up to +180)	Meets: MAN 283 Li-P0, Central lubrication systems Groeneveld	Multi-purpose grease for heavy loaded bearings; application in construction machines, agricultural machinery and special units
Liquid grease SGA 600 G0F-20	Natrium soap Mineral oil -	0	170	-20 up to +80		Lubrication of closed gears under normal loads
Adhesive Lubricant OG 0 OGPF0S-20	Aluminium complex soap Mineral oil Graphite	0	1000	-20 up to +200 (short-term up to +250)	Hans Lingl Anlagenbau und Verfahrenstechnik GmbH & Co. KG	For cement tube mills, crane installations, heavy construction machinery; EP properties
Combiplex OG 0-2500 OGPF0S-20	Aluminium complex soap Mineral oil+Synthetic oil Graphite	0	2500	-20 up to +200 (short-term up to +250)		For cement tube mills, crane installations, heavy construction machinery; EP properties
Combiplex OG 05 KPG0G0-1N-30	Lithium-calcium complex soap Mineral oil -	0-1	800	-30 up to +140 (short-term up to +180)		Heavy pressure loaded bearings at increased bearing temperatures, water resistant, fit for off-shore application
Anti-corrosion and contact greases						
Anti-corrosion grease SW 2 KP1-2E-25	Calcium soap Mineral oil -	1-2	100	-25 up to +80	Meets: BW-TL 91050-0066, Defence Standard 91-34/1, NATO G 460, STM 7420/B	Anti-corrosion grease against aggressive water (seawater) and gases, sealing properties against cold and hot water
Contact grease EL-K2 M2E-30	Calcium soap Mineral oil -	2	25	-30 up to +85		Protection against corrosion and contact wear for copper-containing contact materials, conductor plates, switches etc., highly resistant towards water
Inert greases						
Addiflon PFPE Premium XH 1 KFK1U-40	PTFE PFPE -	1	420	-40 up to +280 (without access of air up to +300)		Ideal for rollers at conveyor units, at drying and enamelling furnaces, in electric motors, tunnel furnaces, hot-gas fans, dry-running compressors etc., high-temperature applications
Addiflon Super 2 EP KPFK2U-50	PTFE PFPE -	2	190	-50 up to +260	Brückner Maschinenbau GmbH & Co. KG	
Addiflon PFPE Premium XH 2 KFK2U-40	PTFE PFPE -	2	420	-40 up to +280 (without access of air up to +300)	Brückner Maschinenbau GmbH & Co. KG, Waltec Maschinen GmbH, Hans Lingl Anlagenbau und Verfahrenstechnik GmbH & Co. KG, Maschinenbau Scholz GmbH & Co. KG	
Addiflon PFPE Premium FD 2 KFK2U-40	PTFE PFPE -	2	500	-40 bis +260 (kurzzeitig bis +280)	Brückner Maschinenbau GmbH & Co. KG, NSF H1 Registrierung	Roller and sliding bearings under high thermal loads in food and pharmaceutical industry, application at baking ovens, baking lines, kiln cars, calenders, guide rolls of transport chains, etc.

MoS<sub>2</sub> – Molybdenum disulphide    PTFE – Polytetrafluorethylene  
PAO – Poly-alpha-olefin    PFPE – Perfluoropolyether

ADDINOL Product Classification acc. to DIN 51 502	Thickener Base oil type Solid lubricants	NLGI Grade	Base oil viscosity at 40°C in mm²/s	Application temperature in °C	Approvals Specifications	Characteristics
Hybrid greases						
Hightemp HF 2 KFKHC2S-20	Special thickener PFPE + Synthetic oil -	2	450	-20 up to +200	Brückner Maschi- nenbau GmbH & Co. KG	Long-term lubrication of roller and sliding bearings at low speed, guide rails and friction pairings with high wear potential, superior ageing resistance both at high temperatures and under the impact of water, acids or lyes
Silicone greases						
Addisil Extemp 2 KSI2R-50	Lithium soap Silicone oil -	2	75	-50 up to +180	Hans Lingl Anlagenbau und Verfahrenstechnik GmbH & Co. KG. Meets: VW-TL 767 X	Low-temperature grease for long-term and permanent lubrication of steel/bronze, aluminium, chrome and plastics, separating and sliding agent, sealing grease
Addiflon OXS 400 MFSI3S-30	PTFE Polysiloxane PTFE	3	550	-30 up to +200	Federal Institute for Materials Testing	Physiologically harmless sliding agent for plants entailing exposure to oxygen, elastomer sliding agent in welding equipment, for diving equipment and breathing apparatus, not compatible with silicone rubber
Addisil Extemp 23 FG MSI3P-40	PTFE Silicone oil -	3	3100	-40 up to +160	NSF H1 Registration	Lubrication and sealing of valves, sleeves, partitions and plugs in food and beverage industry as well as pharmaceuticals
Lubricating greases for food industry – With NSF H1 registration 						
Multiplex FD 00 GPFHC00P-40	Aluminium complex soap Synthetic oil White solid lubricants	00	350	-45 up to +160 (short-term up to +200)	NSF H1 Registration	Liquid grease, suited for central lubrication systems
Multiplex FD 1 KPHC1P-40	Aluminium complex soap Synthetic oil -	1	260	-40 up to +160 (short-term up to +180)	NSF H1 Registration	Usage at roller and sliding bearings, useable as multi-purpose greases
Multiplex FD 2 K2N-20	Aluminium complex soap Medical white oil -	2	160	-20 up to +140 (short-term up to +180)	NSF H1 Registration	
FG Grease AL 2 KPFHC2P-40	Aluminium complex soap Synthetic oil White solid lubricants	2	350	-45 up to +160 (short-term up to +200)	NSF H1 Registration	
Addiflon PFPE Premium FD 2 KFK2U-40	PTFE PFPE -	2	500	-40 up to +260 (short-term up to +280)	Brückner Maschi- nenbau GmbH & Co. KG, NSF H1 Registration	Roller and sliding bearings under high thermal loads in food and pharmaceutical industry, baking ovens, baking lines, kiln cars, calenders, guide rolls of transport chains, etc.
Addisil Extemp 23 FG MSI3P-40	PTFE Silicone oil -	3	3100	-40 up to +160	NSF H1 Registration	Lubrication and sealing of valves, sleeves, membranes and plugs in food and beverage industry as well as pharmaceuticals
Biodegradable greases 						
Ecosynth Flange Grease G MFE000E-30	Calcium soap Ester Graphite	000	25	-30 up to +80	REBS Zen- tralschmiertechnik GmbH	Wheel flange and slide surface lubrication at junction plates, couplers and drawgears
Ecosynth Flange Grease MPE00/000E-30	Lithium soap Ester -	00/000	50	-30 up to +80	REBS Zen- tralschmiertechnik GmbH	Wheel flange lubrication at stationary and mobile lube facilities
Ecoplus BG 2 MPE2G-20	Lithium-calcium soap Native oil -	2	35	-20 up to +100 (short-term up to +120)		Lubrication of bearings at normal loads
Ecosynth Super 2 KPF2K-30	Lithium-calcium complex soap Ester Light-coloured solid lubricants	2	110	-30 up to +120		Lubrication of tooth flanks, rails and guides, roller and sliding bearings, universal lubrication in construction and at machine tools etc.



## ➤ ADDINOL Pastes

ADDINOL Product Classification acc. to DIN 51 502	Thickener Base oil type Solid lubricants	NLGI Grade	Base oil viscosity at 40°C in mm²/s	Application temperature in °C	Approvals Specifications	Characteristics
<b>Pastes</b>						
ADDIFLON PTFE White 1 Paste MLE1N-40	PTFE Ester PTFE	1	2200	-40 up to +140		Lubrication of sliding machine components of metal, plastics or ceramics
Drilling Lube -	- Mineral oil Solid lubricants	1	110	-20 up to +150 (short-term up to +170)		Separating agent for screw connections, sealing and corrosion protection for precision threads, for screw connections of drill rods in geological drilling and at further mining tools, in general machine construction, in steel and rolling mills. NOT suited for roller bearings!
Anti-Seize Paste GAL MLPF1U-20	Lithium soap Mineral oil + Synthetic oil Aluminium	1	220	-20 up to +1200		Screw, assembly and separating agent, sealing and anti-corrosive, for general mining, machine construction, power plants, industry; NOT for roller bearings
Anti Seize Paste 23 White MPF2-60	- PAO PTFE	2	32	-60 up to +250		Lubrication of bearings, shafts and guides, auxiliary agent for deep drawing, hobbing, thread cutting; assembly paste; sealant for sealings and flanges
Release and lubrication paste GSM 400 -	Synthetic Mineral oil Graphite	2	150	-20 up to +140 (dry lubrication up to +400)		Separating, sealing, preserving and lubricating agent for screws, bolts, notches, flat springs, wire ropes, valves and plugs; sliding agent for guides; agent for dry lubrication between +200°C and +400°C in furnaces, steel mills, foundries, etc.
Chisel paste MF2U-20	Aluminium complex soap Mineral oil Metal powder	2	350	-20 up to +1100		Lubrication of plug tools and wear bushings at hydraulic and pneumatic hammers; for plug and bolted connections as well as bayonet joints
Assembly paste HTP 700 PG MPF2-20	- Polyglycol MoS <sub>2</sub>	2	460	-20 up to +200 (solid lubrication up to +700)		High-pressure and high-temperature lubricant in machine construction, for slideways and guide rails; lubrication of hot screw connections; facilitates running-in at bearings and gears
Assembly paste WKT 2 -	- Synthetic oil MoS <sub>2</sub> + Graphite	2	800	-30 up to +1000 (from +200 dry lubrication)	Dieffenbacher GmbH	High-temperature lubricant against freezing of bolt, screw and plug connections, flanges, sealings and guides in industrial applications
ADDIFLON PTFE White 3 Paste MLE3N-20	PTFE Ester PTFE	3	5000	-20 up to +150		Lubrication of sliding machine components made of metal, plastics or ceramics
Drawing Lube 35 -	- native Ester -					Water soluble paste free of mineral oil for drawing surface-treated steel wires; for phosphate-treated, limed, zinc-coated, copper-plated steel wires, also for wires pulled dry

MoS<sub>2</sub> – Molybdenum disulphide    PTFE – Polytetrafluorethylene  
 PAO – Poly-alpha-olefin    PFPE – Perfluoropolyether



## ➤ Lubricating greases and pastes – Basics and practical tips

### Composition of lubricating greases

Lubricating greases are semi-liquid 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 ( $\text{MoS}_2$ ) 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.



## 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 XTF 2: 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

<b>K</b>	Roller bearings, sliding bearings, slide surfaces	<b>OG</b>	Open gears and toothings
<b>G</b>	Closed gears	<b>M</b>	Sliding bearings and seals

#### Additional code letter usability

<b>F</b>	Solid lubricant additive	<b>P</b>	With additives for reducing friction and wear and increasing loadability
<b>L</b>	With additives for increasing corrosion protection and/or ageing resistance		

#### Additional code letter for synthetic oils

<b>E</b>	Organic esters	<b>PH</b>	Phosphoric ester
<b>FK</b>	Perfluorinated oils	<b>SI</b>	Silicone oils
<b>HC</b>	Synthetic hydrocarbons	<b>X</b>	Further
<b>PG</b>	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)

<b>C</b>	+60°C	<b>N</b>	+140°C
<b>D</b>		<b>P</b>	+160°C
<b>E</b>	+80°C	<b>R</b>	+180°C
<b>F</b>		<b>S</b>	+200°C
<b>G</b>	+100°C	<b>T</b>	+220°C
<b>H</b>		<b>U</b>	> +220°C
<b>K</b>	+120°C	The upper application temperature for permanent lubrication corresponds to the test temperature at tests acc. to DIN 51806/2 and DIN 51821/2 respectively (for passed test runs).	
<b>M</b>			

#### 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. All greases listed in the table below are also available in PULSARLUBE V lubricators which cannot be refilled. 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
S	grease gun	100 ml	1	battery-free operation no timer function
V	for single use	250 ml	1	battery operated programmable timer

### ADDINOL High-Performance Greases in service pouches

ADDINOL Grease	250 ml	500 ml
Multi-Grade Grease LM 2 EP	✓	✓
Multi-Purpose Grease L 2 M0	✓	
Hightemp EK 2	✓	✓
Ecoplus BG 2	✓	
Longlife Grease HP 2	✓	
Wear Protect HTP 2	✓	
Multiplex FD 1	✓	
Hightemp XFT 2	✓	

# ADDINOL®

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

handed over by:



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High-performance lubricants

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