CYCLON®

GREASES

CATALOG **2021**

The right lubricant for every use

Grease or Oil?

The main reasons for the use of greases instead of lubes have been documented by the SAE (Society of Automotive Engineers) in the “SAE J310, Vehicle Lubricating Grease” brochure:

Greases are often used instead of lubricating oils where a lubricant is required to "stay in place" (i.e. to maintain its position in a mechanism or system, especially where opportunities for frequent re-lubrication may be limited or economically unjustifiable. This requirement may be due to the physical configuration of the mechanism/system, the mode of movement, the type of sealing or the need for the lubricant to perform all or part of any sealing function in order to prevent leakage/increased consumption or/and contamination.

PROPERTIES		
Lubricity	✓	✓
Sealing	✓	X
Protection against	✓	✓
Corrosion	✓	X
Consistency	X	✓
Heat Transfer	X	✓

APPLICATION TYPE		
Hydraulic Systems	X	✓
Gear Boxes	✓	✓
Bearings	✓	X

How does it work?

Grease thickeners absorb the base oil and additive components - just like a sponge does - and release them when under pressure. The components of the grease minimize friction and create a lubricating film between moving parts. Because of its structure and this action mechanism, the grease achieves the following:

1. **Reduces friction and wear.**
2. **Enhances protection from corrosion.**
3. **Seals and protects bearings from contaminants and water.**
4. **Resists leakages, dripping, or throw-offs.**
5. **Resists structure and consistency changes during service.**
6. **Retains its mobility under conditions of application.**
7. **Tolerates or repels moisture.**
8. **Is suitable for a wide range of operating temperatures.**

What is grease?

A solid to semi-solid product of a thickening agent into a base oil.
Other ingredients that give special properties can be included.

The fibrous structure of the thickener retains the base oil, like a sponge.
Grease is a consistent lubricant, not a viscous lubricating oil.

Base oil 75-97%	› Mineral oil › Synthetic › Vegetables-derived
Thickener 3-25%	› Soap › Inorganic thickener › Polymer
Additives ≤10%	› Chemical additives › Solids (lubricants) › Colors

What does a grease consist of?

BASE OIL

It is the main component of grease. Base oils can be:

› Of mineral base, either paraffinic (Group I) or naphthenic (Group V),
› High purity, pharmaceutical (Group I/Group II),
› Synthetic base (Group III),
› Synthetic (Group IV), poly-a-olefin base (PAO),
› Synthetic (Group V), ester base, poly-glycol (PAG), silicone, poly-phenyl ether (PFPE), etc.
› Biodegradable (soybean, rapeseed oil, castor oil, etc.) oil or,
› Any liquid that provides lubricating properties.

The choice of base oil influences a greases's viscosity and lubricating properties. The base oil of the grease is the one that mainly lubricates, except for applications where very low speeds or high/vibrating loads are involved.

The base oil influences the grease's tolerance to oxidation and thermal degradation, its performance at high and low temperatures and its behavior at low temperatures. In addition, vegetable-derived base oils and synthetic esters are biodegradable, as such enhancing environmental protection (after the grease has been disposed of). Synthetic base oils have excellent flow properties at low temperatures.

Properties/ Behavior	Group I	Group II/III	PAO	Esters	PAG	Silicons	PFPE
Oxidative stability	MO	GO	GO	GO	GO	VG	EX
Thermal stability	MO	GO	GO	GO	GO	VG	VG
Lubricity	GO	GO	GO	GO	EX	LO	GO
Elastomers compability	GO	GO	GO	LO	LO/GO	GO	GO

LO: Low | MO: Moderate | GO: Good | VG: Very Good | EX: Excellent

ADDITIVES

Additives provide additional properties, depending on the desired performance characteristics.
The chemical additives of greases are similar to those of (liquid) lubricants. The most common are:

Antioxidants → **They slow down the oxidation of the basic lubricant.**

Anti-corrosion → **Protects metal surfaces from corrosion.**

Anti-wear → **Provides protection against wear in borderline lubrication conditions.**

High pressure → **Provides protection against high loads and vibrations.**

Polymers → **Improve water resistance and adhesion to metal surfaces.**

Solid lubricants (e.g. graphite, MoS2) → **Provide protection and reduction of friction under high load/slip conditions at low speeds.**

Dyes/Colors → **Color the greases according to requirements.**

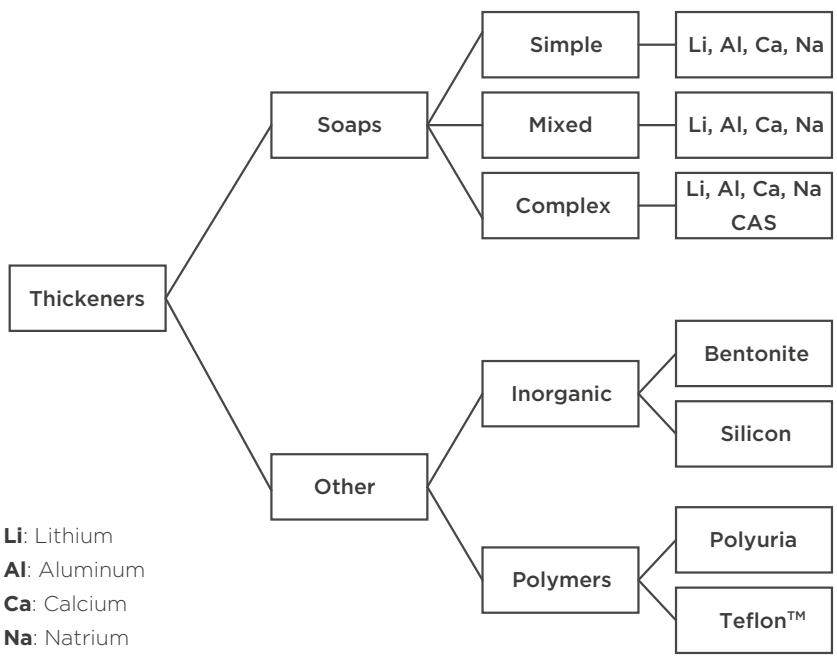
DEPENDING ON THE INTENDED APPLICATION, DIFFERENT ADDITIVES MIGHT BE REQUIRED

ADDITIVES	SUPPORT BEARINGS	BALL BEARINGS	THRUST BEARINGS (AXIAL)	CYLINDER BEARINGS	ROLLER BEARINGS (NEEDLE)
Antioxidants	●	●	●	●	●
Anti-foam	●	●	●	●	●
Against wear / EP		●	●	●	●
Anti-Rust	●	●	●	●	●
High pressure			●	●	
Demulsibility	●	●	●	●	●
Viscosity index modifier	●	●	●	●	●
Anti-corrosion	●	●	●	●	●

● Required ● Depending on the application

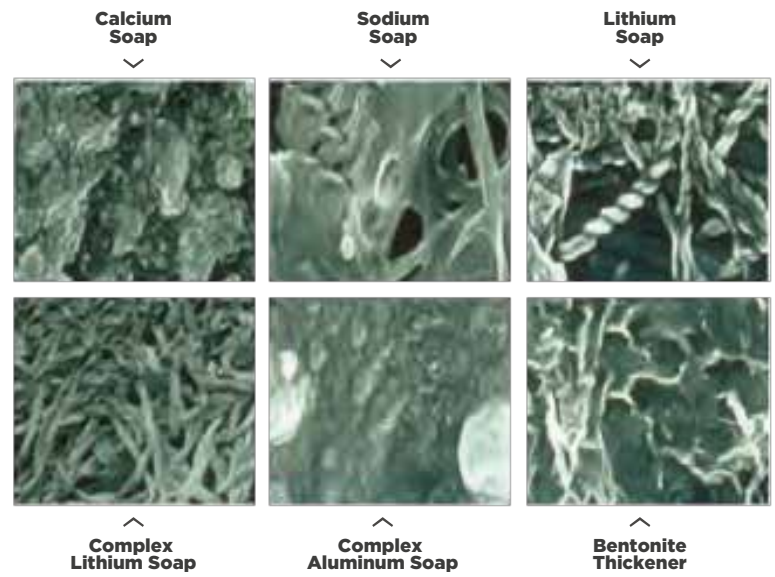
THICKENER

The easiest way to illustrate the function of a thickener is to compare it to a sponge, the structure of which is such that it retains the base oil. The type of thickener is important for the quality of the grease. Features such as the dropping point, mechanical stability, water resistance, lubrication, re-lubrication intervals, operating temperatures and sealing depend on the thickener. The thickeners are classified into two main groups:



Li: Lithium
Al: Aluminum
Ca: Calcium
Na: Natrium
CAS: Sulfonate Calcium

Indicative examples of thickener structures



Grease characteristics

Pumpability

The ability of the grease to flow under pressure through lines, the nozzles and distribution system components. This attribute is important for low temperature applications and central lubrication systems.

Dropping point

The temperature at which the thickener component loses its ability to withhold/retain the base oil component in its structure and starts to separate (passes from semi-solid to liquid phase) under specific test conditions.

Mechanical stability

The ability to withstand changes in its structure after prolonged use/operation. It is influenced by the type and the amount of thickener.

Consistency

Consistency by NLGI number is the penetration number that represents the penetration depth of a specified cone within 5 seconds within a certain amount of grease.

Compatibility

Refers to the behavior of a mixture of greases with different thickeners. Incompatible grease mixtures result in reduced consistency, seal leaks and low efficiency.

Oil separation

It expresses a tendency to separate the base oil from the grease during its storage period. The phenomenon is more common in lower consistency greases produced with lower viscosity base oils.

Water resistance

The ability of a grease to resist addition of water or water washout without any loss of grease structure.

Texture

Texture refers to grease's appearance and "feel" and is correlated with the consistency and ease of handling of the grease. Texture depends on base oil's viscosity, type and quantity of the thickener, additives and production process.

GREASE CONSISTENCY (@25°C & 60 strokes: ASTM D217)

NLGI	WORKED PENETRATION 1/10 OF THE MILLIMETER	DESCRIPTION & TYPICAL USE	EQUIVALENT
000	445-475	Semi-fluid: Central systems	Cooking oil → Mustard → Peanut Butter → Frozen Yoghurt → Cheddar Cheese
00	400-430	Semi-fluid: Central systems	
0	355-385	Semi-fluid: Central systems	
1	310-340	Very soft: Grease gun or Central systems	
2	265-295	Soft: Grease gun or Central systems	
3	220-250	Light: Grease gun	
4	175-205	Solid: Grease gun (pneumatic)	
5	130-160	Very solid: Grease container (mechanism)	
6	85-115	Block: Open grease container	

COMPARISON OF TYPICAL PROPERTIES OF DIFFERENT THICKENERS (indicative)

Thickener properties	Ca*	Li	CaS-X	Li-X	Al-X	PU	Clay
Drop point,°C	135-140	160-200	≥260	≥240	≥260	≥230	--
Maximum (continuous) operating temperature,°C	110	125	150	160	150	150	150
Usage in high temperatures	LO	GO	EX	EX	EX	EX	EX
Mech. stability	MO	GO	GO	EX	GO	GO	ME
Water resistance	GO	GO	EX	EX	EX	EX	GO

Ca*: Anhydrous Calcium | **Li**: Lithium | **CaS-X**: Complex Calcium Sulfonate | **Li-X**: Lithium Complex
Al-X: Aluminum Complex | **PU**:Polyuria | **Clay**: Calcium Sulfonate Complex | **Na**: Natrium

LO: Low | **MO**: Moderate | **GO**: Good | **EX**: Excellent

Grease categorization

Grease codes in compliance with the DIN 51825 norm.

This is not a categorization of greases but a process of identifying them based on the type of grease, the base oil, the lower and upper operating temperatures and their reaction (behavior) in the water.

DIN 51825 **K** **P** **HC** **F** **2** **R** **-50**

NLGI

"KEY" DIGITS/CHARACTERS: WHAT THEY MEAN

Code	Grease/application type
K	**For abrasion bearings, radial bearings and sliding surfaces, according to DIN 51825**
G	For closed gearboxes, according to DIN 51825
OG	For open gearboxes (sticky lubricants without asphalt)
M	For radial bearings and seals

Code	Lubricating materials
F	For lubricants with solid additive, e.g. PTFE, graphite.
P	**For lubricants with active ingredients to reduce wear and friction, and to increase load carrying capability, e.g. CLP100 lubricants, according to DIN 51517**

Code	Synthetic or partially synthetic liquids
E	Organic esters
FK	PFPE
HC	**Synthetic hydrocarbons**
PH	Esters or phosphoric acids
PG	Polyglycols
SI	Silicone oils
X	Others

Code	Maximum operating temperature
E	+80
F	+80°C (moderate/high reaction in H_2O)
G	+100°C
H	+100°C (moderate/high reaction in H_2O)
K	+120°C
M	+120°C (moderate/high reaction in H_2O)
N	+140°C
P	+160°C
R	**+180°C**
S	+200°C
T	+220°C
U	>220°C

Code	Minimum operating temperature
-10	-10°C
-20	-20°C
-30	-30°C
-40	-40°C
-50	**-50°C**
-60	-60°C

Grease codes in compliance with the ISO 6743-9 norm.

Grease codes stand for an identification process based on the maximum and minimum operating temperatures, their resistance to high loads and water reaction.

ISO 6743-9 L X C D F B 2

NLGI

"KEY" CHARACTERS/DIGITS: WHAT THEY MEAN

Norm	Class	Family
ISO 6743-9	**L**	**X**
	Lubes	**Greases**

Symbol 3	Minimum operating temperature
A	0
B	-20
C	**-30**
D	-40
E	<-40

Symbol 4	Maximum operating temperature
A	+60
B	+90
C	+120
D	**+140**
E	+160
F	+180
G	>+180

Symbol 5	Contamination with water[a]	Rust protection[b]
A	L	L
B	L	M
C	L	H
D	M	L
E	M	M
F	**M**	**H**
G	H	L
H	H	M
I	H	H

a: L = dry, M = static, H = water wash

b: L = no protection, M = protection against water, H = protection against sea water

Symbol 6	High load properties (EP)
A	NO
B	**YES**

COMPATIBILITY TABLES

THICKENER COMPATIBILITY

	Lithium	Calcium	Complex Lithium	Complex Calcium	Calcium Sulfonate Complex	Aluminum Complex	Bentonite	Polyuria
Lithium	+	●	+	−	+	−	●	●
Calcium	●	+	+	−	+	−	●	●
Complex Lithium	+	+	+	+	+	+	−	−
Complex Calcium	−	−	+	+	+	●	●	+
Calcium Sulfonate Complex	+	+	+	+	+	−	−	+
Aluminum Complex	−	−	+	●	−	+	−	●
Bentonite	●	●	−	●	−	−	+	●
Polyuria	●	●	−	+	+	●	●	+ NB

BASE OIL COMPATIBILITY

	Mineral Base/PAO	Esters	Polyglycoles	Silicons: Methyl	Silicons: Phenyl	Polyphenyl Ether	Fluorinated (PFPE)
Mineral Base/PAO	+	+	−	−	+	●	−
Esters	+	+	+	−	+	●	−
Polyglycoles	−	+	+	−	−	−	−
Silicons: Methyl	−	−	−	+	+	−	−
Silicons: Phenyl	+	+	−	+	+	+	−
Polyphenyl Ether	●	●	−	−	+	+	−
Fluorinated (PFPE)	−	−	−	−	−	−	+

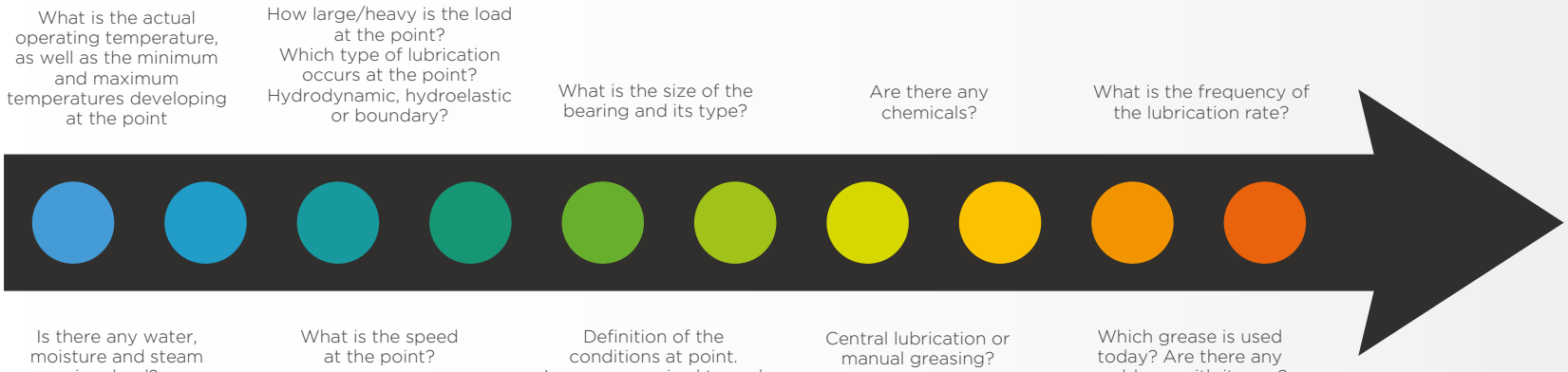
+ Compatible ● Check required - Incompatible **NB** The polyuria greases are not necessarily compatible with each other

Choosing the right grease

Knowing that the different components found in a grease provide for special and/or unique properties, it is objectively difficult to select the right grease for the application. Moreover, the selection of a grease based on the use of a pre-existing grease product will "copy" the mistakes made in the past.

It is often the case that the selection was made years ago. Very often, unfamiliarized users tend to select a general use of grease due to their lack of application know-how. This could lead to "improper" lubrication and equipment malfunction or damage. Insisting on a certain type of grease, will not eliminate possible problems occurred by this type of grease. Nowadays, there are new technologies and practices that can improve grease selection, equipment performance and, as a result, reduced damage and enhanced economizing.

WHICH QUESTIONS SHOULD SOMEONE ASK?



GREASE PROPERTIES INDICATIVE COMPARISON

Property	Terminology	Lithium	Lithium Complex	Calcium Complex	Aluminum Complex	Bentonite
Stability	› Mechanical stability › Rolling stability	●●●● ●●●●	●●●● ●●●●	●●●●● ●●●●●	●●● ●●●	●●●● ●●●
High temperature	› Drop point › Lifespan (at high temperatures)	●● ●●	●●● ●●●	●●●●● ●●●●	●●● ●●●	●●●●● ●●●●
Water resistance	› Water washout › Water splash › Rolling stability (in the presence of water)	●●● ●● ●●	●●● ●● ●●●	●●●●● ●●●●● ●●●●●	●●●●● ●●●● ●●●●	●●● ●●● ●●
High pressures	› Welding load › Timken › Scar wear diameter	●● ●● ●●●	●●● ●●● ●●●	●●●●● ●●●●● ●●●●	●●● ●● ●●●●	●● ●● ●●●

INDICATIVE WORKING ENVIRONMENT RECOMMENDATIONS

Working environment conditions	Industry/Sector	Recommendation
› Moderate loads › Temperatures -18/+120°C › High speeds › Small water inflow	› Agricultural sector, Crops › Trucks and cars (general use)	Lithium ER 2 (viscous base oil/BOV 150-220)
› High loads › Temperatures -18/+150°C › Moderate speeds › Partial water inflow	› Agricultural sector › Mines › Construction sector › Crops › Trucks and auto (heavy type)	Complex Lithium ER 2 (viscous base oil/BOV 150-220)
› Extreme loads › Temperatures -18/+150°C › Low speeds › Presence of moisture/dust	› Agricultural sector, Crops › Off-road › Mines › Heavy industry	Lithium Complex ER 2 (viscous base oil/BOV 400) or Calcium Complex
› Moderate loads › Temperature -40/+180°C › High speeds › Partial presence of water	› Agricultural sector, Crops › Off-road › Mines › Heavy industry	Synthetic greases (Lithium Complex, Polyuria, Calcium Complex)
› Accidental contact with food › Low/high temperatures › Moderate loads › High speeds	› Food and beverage industry	NSF H1 Aluminum Complex Writer
› Accidental contact with food › Very high temperatures (≤150°C) › Extreme loads › Moderate speeds › High water presence	› Food and beverage industry	NSF H1 Complex Calcium or Synthetic FG (foodgrade)
› High temperatures › Extreme loads	› Steel › Mining › Paper industry	Calcium Complex or Aluminum Complex

GENERAL RECOMMENDATIONS BASED ON TYPE/PROFILE OF THE GREASE (INDICATIVE)

Grease profile	Operating temperatures, °C	Industry/Sector/Conditions
Lithium with suitable base oil and BOV (base oil viscosity) and additives.	≤120	› Multi-purpose › Truck, vehicle and auto chassis › Non-demanding industrial uses
Complex Lithium with suitable base oil and BOV (base oil viscosity) and additives.	150-180	› High temperatures › High pressure and shock loads
Aluminum Complex with suitable base oil and BOV (base oil viscosity) and additives.	150-180	› Very high presence of water/steam or moisture › High temperatures › Food and beverage industry › Mines
Polyurea with suitable base oil and BOV (base oil viscosity) and additives.	150-200	› High temperatures › Ovens, conveyor belts › Electric motor bearings
Inorganic Grease - derived from bentonite thickener	150-160	› High temperatures › Food and beverage industry
Calcium Sulfonate Complex with suitable base oil and BOV (base oil viscosity) and additives.	150-180	› Very high presence of water/steam or moisture › Mines and Shipping › High temperatures

INDICATIVE GREASE SUITABILITY PER INDUSTRY

Capacity	Lithium	Lithium Complex	Calcium Complex
Car Industry	●●	●●●	●●●●
Mining	●●	●●●	●●●●●
Maritime/Offshore	●●	●●●	●●●●●
Steel	●●	●●	●●●●
Electricity generation	●●	●●●	●●●●
Farming sector	●●	●●●	●●●●
Food industry			●●●●
Drilling	●●	●●●	●●●●●

GREASES

CYCLON®

With more than 35 years of know-how and expertise in the production and trading of lubricants and petroleum products and present in more than 40 countries, LPC fully understands the complexity of a global market with very different (local) requirements. It is an increasingly complex reality determined by a combination of overlapping commercial trends, technical developments and economic parameters.

Starting with our in-depth knowledge of market trends and requirements and subsequent technical developments, LPC, in collaboration with ABB Cellier, has completed the construction of a state-of-the-art grease production unit.

Due to ABB Cellier's longstanding experience in designing and manufacturing state-of-the-art equipment and automation technology, intended for special industrial applications, a highly flexible and modern unit with a very high degree of automation was built, capable of producing various types of grease from the simplest conventional grease to the most sophisticated types of complex soap or/and synthetic ones.

Process Innovation

In the heart of LPC's grease unit lies a heated pressure reactor, which, by leveraging the increase of the reaction rate at high pressures, enables a reduction of the time required to produce the soap.

At the same time, the design of its heating system, which allows the internal and external circulation of the heating medium, in conjunction with an advanced pressure regulating and discharge control system, as well as a powerful, adjustable rotating speed mixer, ensure the accurate control of reaction conditions and the efficient heat transfer and mixing of components.

The new unit employs three finishing kettles for the introduction of any additional ingredients and the further processing of the grease. Each kettle employs a planetary mixing system consisting of two inverse rotation mixers capable of handling thicker greases (up to NLGI 3 consistency). The ability of the kettles, to either cool off or heat up selectively, provides a flexibility and covers various temperature requirements of various grease producing types.

The production of each grease product is completed with its homogenization in two colloidal mills. Prior to its packaging, the grease passes through a de-aerator and then, through the units' one of the two automated, self-cleaning filters. The former removes entrapped air, a process that has a positive effect on the appearance, as well as on the stability and performance of the grease. The latter removes any undesirable particles that can cause wear during use.

For the packaging of the greases, there are two semi-automatic lines that are connected with the unit in series, capable of filling both drums as well as smaller pails. There is also the option of filling cartridges through a dedicated, semi-automatic machine.

LPC demonstrates a strong sensitivity in work safety and environmental protection issues therefore the unit features a particles retention system; these are particles that may be released in the form of dust during materials' handling process. The unit also features a reactor decompression gases management system.

The stability of all produced greases is secured both by the accurate addition of all required raw materials and the very strict control of production conditions. The new unit features state-of-the-art systems for the management and dosage of raw materials, such as automatic dosing meters, transfusion systems (for liquids and soap-textured materials) and pigging lines. Adding color to the grease, whenever required, is done by an automated dyeing system with a precision dosing pump prior to its packaging.

Unit operation is controlled through the GREACEL system (a tailor-made, in-house developed software by ABB Cellier for greases production control) which accomplishes the following features: management and traceability of materials and processes, depiction of the progress of production process in each of its individual stages, complete control of the production conditions and accurate execution and reproduction of the production formulations. All the above ensure the production of superior quality and in the long term, stable products.

Product Flexibility

Research and development are areas where LPC places special interest and considers them critical for our advancement. For this reason, the unit is being supported with a "pilot" system, a complete, scaled production unit.

The "pilot" consists of a 40kg heated pressure reactor operating on the same principle as the main reactor and a heated mixing tank, which simulates the operation of the final mixing tanks. The purpose of the pilot unit is both the development of new products (NPD) – because of customers' specific needs and small volume, custom-made productions – as well as the evaluation and utilization of new raw materials and additives.

Finally, the strict quality control of raw materials and finished products being a critical practice, a fully equipped, designated laboratory has been put together. The laboratory can perform eleven different tests that concern the control of physical-chemical and functional characteristics determining grease performance during use. Amongst others, mechanical stability after prolonged worked 10,000 strokes and 100,000 strokes, oxidation stability, water washout resistance, oil separation, wear prevention properties in extreme pressures (EP+AW), etc.

The new unit, having been high-spec designed, aiming at meeting our ever-increasing needs in greases production, is expected to continue out long tradition of providing innovative and high quality products and services.

Summarizing the benefits that the ultra-modern, evolutionary design of the new unit offers to the produced greases, we mention the following:

› Appearance, homogeneity and stability of the produced greases.

› Ability to produce all types and categories of greases for multiple applications in industry, shipping and vehicles of all types.

› Possibility to meet special requirements and specifications (custom-made greases) on a case by case basis.

› Minimizing the possibility of human error due to the full automation of production.

› Ensuring excellent conditions for safety, hygiene and environmental protection during the production process.

› Continuous and reliable control in all production phases.

› Ability to implement grease monitoring programs during use, by excecuting special analysis in the state-of-the-art quality control laboratory.

› Minimize production costs due to full automation.

› Evolution in the production process that makes possible the timely planning of production as well as the delivery of smaller quantities of specialized products in a wide range of packaging.

› Fully meet the requirements of the most advanced quality standards of manufacturers and independent organizations in almost all existing applications worldwide.

Product Branding & Coloring

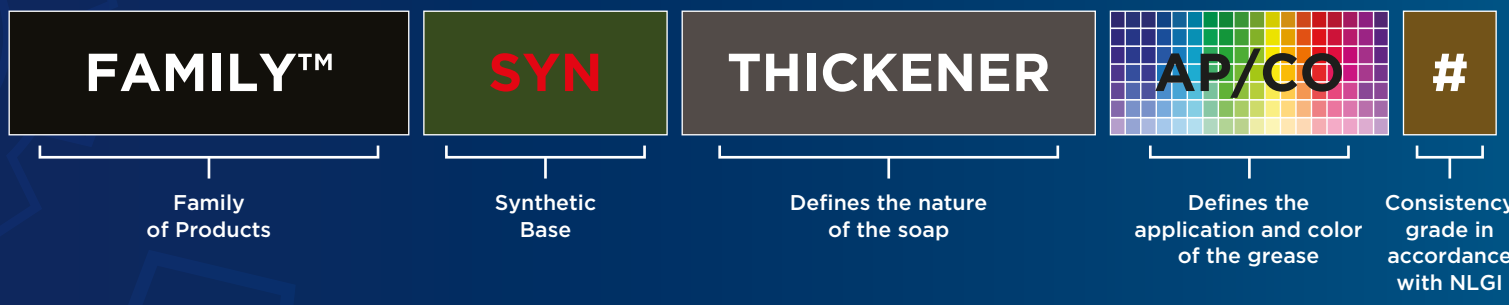
PRODUCT CODING			
Level of Quality	Family	Package Coloring	Grease Coloring/ Category
Premium/Top tier	INNOVA™	Gold	COMPLEX SYNTHETIC FOOD GRAPHITE/MOS2 CONVENTIONAL COTTON
Performance/Working	PREMUS™	Bronze	

INNOVA™

PREMUS™

Product Coding & Classification

WHAT STANDS BEHIND THE NAME OF THE PRODUCT ON THE LABEL?



2 EXAMPLES

DIN 51825 K P HC F 2 (NLGI) R -50

Label	Name	Description	Categorization (DIN 51825)	
	INNOVA™	Premium series	K	For bearings and/or sliding surfaces
	SYN	Synthetic base	P	Contains EP additives
	COMPLEX	Complex soap	HC	It contains synthetic base oil
	FG-HT	Ideal for the food industry and applications at very high temperatures, of off-white color	F	Contains solid lubricants
			2	NLGI 2 Consistency
			R	Upper operating temperature up to +180°C
	NLGI 2	NLGI 2 Consistency	-50	Lower operating temperature down to -50°C

ISO 6743-9 L X B C E A 2 (NLGI)

Label	Name	Description	Categorization (DIN 51825)	
	PREMUS™	Performance/Working	L	Lubricant
	~~SYN~~	Mineral base	X	Grease
	LI-CA	Mixed soap	B	Lower operating temperature down to -20°C
	Natural color for applications that require high resistance to washing and high thermal/ mechanical stability		C	Upper operating temperature up to +120°C
			E	For wet environments and anti-corrosion protection in the presence of water/moisture
			A	Does not contain high pressure additives (EP)
	NLGI 2	NLGI 2 Consistency	2	NLGI 2 Consistency

Product Portfolio

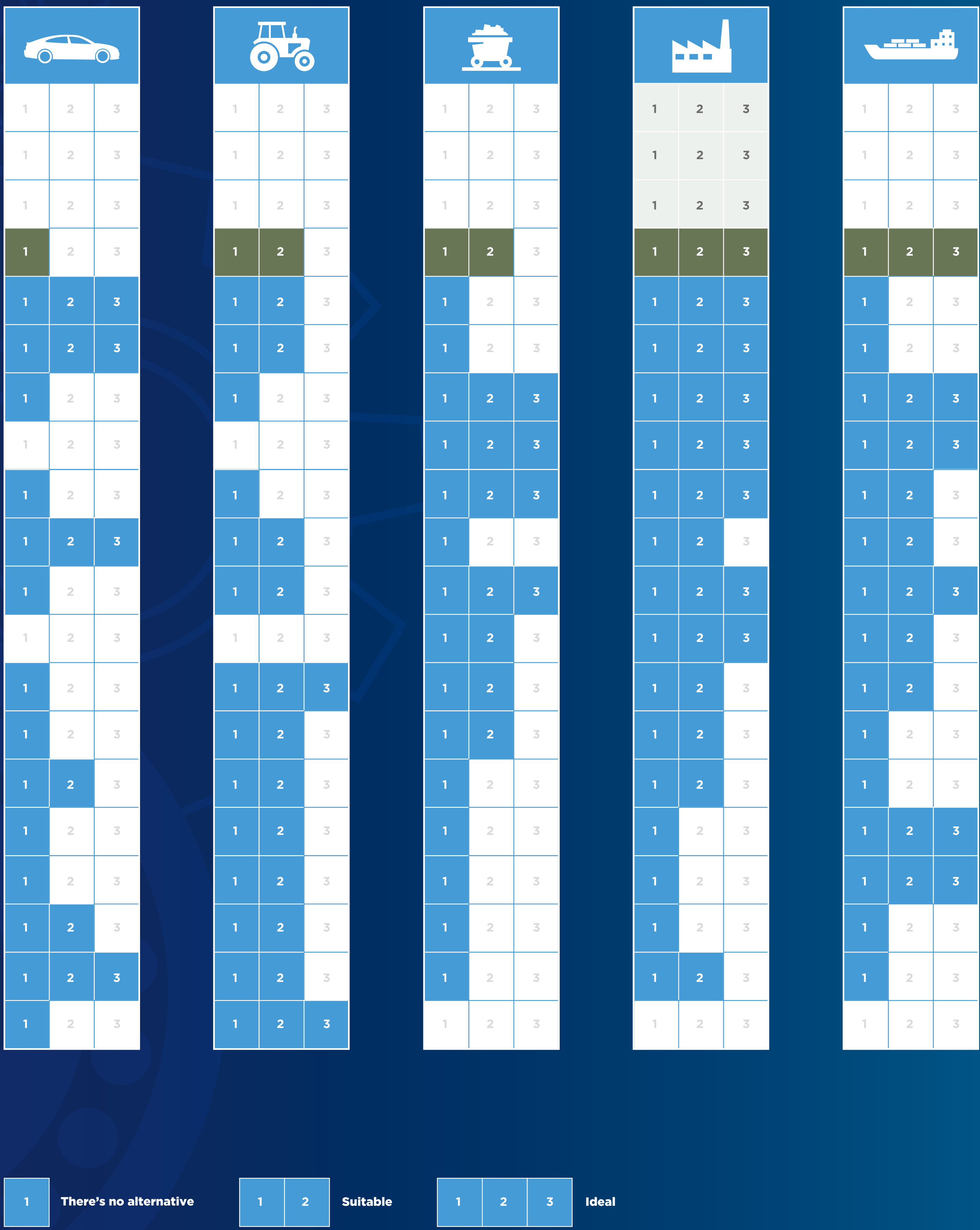
	Grease's Name CYCLON®	Grease's Color	NLGI	Soap/ Thickener	Base oil		Solid lubricant	Drop point, °C	Operating temperatures, °C	
					Type	Viscosity (BOV) @40°C, cSt			Lower	Upper
PREMIUM (TOP-TIER)	INNOVA™ SYNCOMPLEX/FG-HT		2	Complex Aluminum	S	>150	TEFLON	>230	-50	170
	INNOVA™ SYNCOMPLEX/FG-LT		1	Calcium	S	36	NO	>220	-60	110
	INNOVA™ COMPLEX/FG-GL		2	Complex Calcium Sulfonate	M	250	NO	>240	-20	150
	INNOVA™ CYBIO		2	Lithium/ Calcium	S	100	NO	>170	-30	120
	INNOVA™ SYNCOMPLEX/TF		2	Complex Lithium	S	220	TEFLON	>260	-25	170
	INNOVA™ SYN/LT		1	Lithium	S	46	NO	>260	-50	100
	INNOVA™ COMPLEX/WTR		1.5	Complex Calcium Sulfonate	M	220	NO	>300	-20	140
	INNOVA™ COMPLEX/WTR		2	Complex Calcium Sulfonate	M	460	NO	>300	-20	160
	INNOVA™ COMPLEX/MLB		2	Complex Lithium	M	460	MOLYBDENUM DISULFIDE	260	-20	140
	INNOVA™ COMPLEX		1, 2	Complex Lithium	M	220	NO	260	-30	140
PERFORMANCE (WORKING)	PREMUS™ CY-WR/OG		2	Calcium	M	220	GRAFITE	200	-20	80
	PREMUS™ BNT		2	Bentonite	M	460	NO	OXI	-20	160
	PREMUS™ MLB		2	Lithium	M	200	MOLYBDENUM DISULFIDE	200	-25	120
	PREMUS™ GRF		2	Lithium	M	200	GRAFITE	185	-25	120
	PREMUS™ LEP		2, 3	Lithium	M	200	NO	200	-25	120
	PREMUS™ LI-CA		1, 2, 3	Lithium/ Calcium	M	150	NO	>180	-20	120
	PREMUS™ CA		2, 3	Calcium	M	220	NO	115	-20	80
	PREMUS™ LI		2, 3	Lithium	M	100	NO	200	-25	120
	PREMUS™ AUTO		00	Lithium	M	200	NO	180	-20	100
	PREMUS™ COT		00	Lithium	M	30	NO	160	-20	100

Categorization in compliance with DIN/ISO	Properties EP/AW			Resistance against Washing			Stay-in-Place			Resistance against Shock/Loads			Oxidative Stability		
DIN 51825 KPHCF2P-50 ISO L-X-EEHB2	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
DIN 51825 KPHC1H-60 ISO-L-X-ECHB1	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
DIN 51825 KP2N-20 ISO L-X-BDHB2	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
DIN 51825 KPE2K-30 ISO L-X-CCIB2	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
DIN 51825 KPHCF2P-25 ISO L-X-CEHB2	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
DIN 51825 KPHC1G-50 ISO L-X-EBHB1	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
DIN 51825 KP1/2N-20 ISO L-X-BDIB1/2	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
DIN 51825 KP2P-20 ISO L-X-BEIB2	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
DIN 51825 KPF2N-20 ISO L-X-BDHB2	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
DIN 51825 KPxN-30 ISO L-X-CDHBx	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
DIN 51502 OGF2E-20 ISO L-X-BBHA2	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
DIN 51825 K2P-20 ISO L-X-BEAA2	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
DIN 51825 KPF2K-25 ISO L-X-CCHB2	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
DIN 51825 KPF2K-25 ISO L-X-CCEB2	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
DIN 51825 KPxK-25 ISO L-X-CCHBx	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
DIN 51825 KxK-20 ISO L-X-BCEAx	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
DIN 51825 KxE-20 ISO L-X-BBBAx	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
DIN 51825 KxK-25 ISO L-X-CCHAx	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
DIN 51826 GP00H-20 ISO L-X-BBEB00	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
DIN 51826 GP00H-20 ISO L-X-BBEB00	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3

1	Low	1	2	Regular	1	2	3	High	

Product Portfolio

	Grease's Name CYCLON®	NLGI	Description/Applications
PREMIUM (TOP-TIER)	INNOVA™ SYNCOMPLEX/FG-HT	2	Very high performance grease, ideal for applications at very high ambient temperatures in the food industry, e.g. on conveyor belts and chains, machinery/equipment in ovens, etc.
	INNOVA™ SYNCOMPLEX/FG-LT	1	Long-lasting grease, special for lubricating bearings and sliding mechanisms of machines operating at extremely low temperatures in the food/beverage, pharmaceutical/cosmetic industries, such as refrigerators/freezers or in "cold" storage rooms.
	INNOVA™ COMPLEX/FG-GL	2	Clear, non-toxic, waterproof grease, suitable for general lubrication of all types of equipment/machinery in the food, pharmaceutical, cosmetics, etc. industries. e.g. wrapping bearing machines, trolley/bottling machines, etc.
	INNOVA™ CYBIO	2	Readily biodegradable grease, ideal for exposed environmental shipping and industrial (e.g. Sewage treatment plants) applications as well as for agricultural or earthmoving machines.
	INNOVA™ SYNCOMPLEX/TF	2	Top grease, ideal for lubricating bearings, bearings, connectors and dowels under high charge in industrial applications and/or automotive, and where high temperatures and/or high speeds are developed.
	INNOVA™ SYN/LT	1	Long-lasting grease, especially for applications at very low operating or ambient temperatures such as machine tools, control equipment, small electric motors, etc.
	INNOVA™ COMPLEX/WTR	1.5	Very high quality grease for heavy-duty industrial applications (shock/load, presence of water, high temperature mud dust). It is especially recommended for central lubrication systems in very demanding processes such as continuous casting applications.
	INNOVA™ COMPLEX/WTR	2	Very high quality grease for lubrication of bearings and sliding mechanisms in very heavy ground processes such as rolling mill applications or in "wet" sections or drying sections in the paper industry, as well as in offshore/shipping applications.
	INNOVA™ COMPLEX/MLB	2	High-performance grease with MoS_2 for extreme applications (loads, dust, moisture, temperatures), such as for lubrication of bearings and sliding mechanisms under very heavy loading on lubricants, steel mills, etc.
	INNOVA™ COMPLEX	1, 2	Top quality, very stable grease, suitable for bearings under heavy load, seals and mechanisms and for a wide range of heavy industrial and shipping automotive applications.
PERFORMANCE (WORKING)	PREMUS™ CY-WR/OG	2	Very durable, sticky grease for multi-purpose application in environments where there is a strong presence of water and/or humidity e.g. cables, crane chassis sliders, open gears, pressure block screws nuts, wedges water pumps, etc.
	PREMUS™ BNT	2	Special grease with bentonite, suitable for applications subject to frequent high temperature cycles, or at steadily elevated temperatures >150°C, such as electric motor bearings in "hot" ventilation systems.
	PREMUS™ MLB	2	High performance, MoS_2-enhanced grease for highly loaded applications requiring good water resistance, wear and friction control.
	PREMUS™ GRF	2	High quality, graphite-enforced grease, intended for demanding industrial applications, e.g. bearings operating at high temperatures or/and low speeds.
	PREMUS™ LEP	2, 3	Multipurpose grease w/ EP additives for all types of plain and roller bearings in automotive, construction, industrial and marine applications.
	PREMUS™ LI-CA	1, 2, 3	High quality, versatile, mixed soap grease for a number of automotive or industrial applications requiring enhanced water resistance.
	PREMUS™ CA	2, 3	Highly stable, calcium-thickened grease for general automotive (road/off-road), shore or offshore deck applications requiring very good water-washout properties.
	PREMUS™ LI	2, 3	Multipurpose grease for all types of plain/roller bearings in automotive, off-road/farming, industrial and marine applications.
	PREMUS™ AUTO	00	Top quality semi-fluid grease with high pressure additives, ideal for central lubrication systems or chassis lubrication of road/off-road vehicles and machinery operating in the agricultural, construction, industrial and even shipping industry.
	PREMUS™ COT	00	Special, green/blue semi-fluid grease with extra rust and corrosion additives for lubrication of cotton collectors. It is ideal for use in applications at low ambient temperatures.


There's no alternative
Suitable
Ideal

GREASES

The new series of "INNOVA" and "PREMUS" greases are produced in the ultra-modern and extremely flexible production unit of LPC that was designed and manufactured in cooperation with ABB Cellier Group. The new unit can produce various types of greases, from conventional commodity types to the more advanced complex soap or/and synthetic greases, covering in full the demands of the latest quality specs/standards of all main OEM and certification bodies worldwide.

INNOVA™

PREMUS™

INNOVA™ COMPLEX/MLB

Very high performance, lithium complex-soaped grease, enhanced with antiwear/extreme pressure additives and MoS_2 for very harsh (i.e. in the presence of water, dust, mud/sludge and subjected to excessive heat) applications requiring extremely high wear and friction control and water resistance. Highly recommended for heavily-loaded bearings and sliding mechanisms to be found in the steel and mining industries, in particular.

NLGI 2: DIN 51825 KPF2N-20; ISO 6743/9 L-X-BDHB2

CODE	GRADE/NLGI	PACKAGING
JG08031	2	DRUM 180KG
JG08036	2	15KG (PAIL)

INNOVA™ COMPLEX

Premium quality, highly stable, multipurpose, EP/AW-enhanced, lithium complex-soaped grease, suitable for loaded bearings, seals or mechanisms to be found in damp/wet or corrosive, high operating temperature-subjected environments. It is suitable for central lubrication systems in a wide range of heavy duty automotive, industrial or marine applications, as it provides for enhanced load-carrying capabilities and excellent wear protection.

NLGI 1: DIN 51825 KP1N-30; ISO 6743/9 L-X-CDHB1
NLGI 2: DIN 51825 KP2N-30; ISO 6743/9 L-X-CDHB2
Fulfils: Volvo STD 97720"

CODE	GRADE/NLGI	PACKAGING
JG07031	1	DRUM 180KG
JG07036	1	15KG (PAIL)
JG07531	2	DRUM 180KG
JG07536	2	15KG (PAIL)
JG07542	2	12X0,4KG

INNOVA™ COMPLEX/WTR

Extreme performance, calcium sulphonate complex-soaped grease with EP additives and outstanding anti-rust/-corrosion properties for severe duty (i.e. shocks/loads-subjected, in the presence of water, dust, mud, high temperatures) applications. It is intended for the lubrication of bearings and sliding mechanisms in extremely demanding processes, such as continuous casting operations or rolling mills in the steel industry, wet and dry (felt rolls) sections in the paper industry and, overall, wet/damp shore/offshore environments.

NLGI 2: DIN 51825 KP2P-20; ISO 6743/9 L-X-BEIB2

CODE	GRADE/NLGI	PACKAGING
JG09031	2	DRUM 180KG
JG09036	2	15KG (PAIL)

INNOVA™ COMPLEX/WTR 1.5

Very high performance, EP-boosted calcium sulphonate complex-soaped grease with outstanding anti-rust/-corrosion properties for severe duty industrial applications (i.e. shocks/loads-subjected, in the presence of water, dust, mud, high temperatures). It is particularly recommended for central lubrication systems in highly-demanding processes, such as continuous casting operations and rolling mills in the steel industry and wet and dry (felt rolls) sections in the paper industry.

NLGI 1.5: DIN 51825 KP1/2N-20; ISO 6743/9 L-X-BDIB1/2

CODE	GRADE/NLGI	PACKAGING
JG08531	1.5	DRUM 180KG
JG08536	1.5	15KG (PAIL)
JG08542	1.5	12X0,4KG

INNOVA™ SYNCOMPLEX/TF

Premium, highly stable, synthetic grease with PTFE (Teflon®) and a top quality lithium complex soap. With a very high dropping point to ensure viscosity retention in very high operating temperatures, it is ideal for drum and high temperature disk brake wheel bearings, fifth wheels, chassis components, U-joints, kingpins, clutch bearings, ball and roller bearings and conveyors in automotive applications. Also suitable for elevated temperature industrial applications where lithium, lithium complex and extreme pressure synthetic greases would be normally specified.

NLGI 2: DIN 51825 KPHCF2P-25; ISO 6743/9 L-X-CEHB2

CODE	GRADE/NLGI	PACKAGING
JG09536	2	15KG (PAIL)
JG09542	2	12X0,4KG

INNOVA™ SYN/LT

Long service, EP-enhanced, lithium-thickened, synthetic grease, specifically intended for demanding low temperarure applications, such as machine tool spindles, control equipment, small electric motors, robots and equipment in extremely low ambient temperatures (i.e. in cold, "northern" climates and mountain areas, in general) or extreme heights (i.e in aviation and aerospace).

NLGI 1: DIN 51825 KPHC1G-50; ISO 6743/9 L-X-EBHB1

CODE	GRADE/NLGI	PACKAGING
JG10031	1	DRUM 180KG
JG10036	1	15KG (PAIL)
JG10042	1	12X0,4KG

INNOVA™ CYBIO

Premium, readily biodegradable, EP-enhanced, multipurpose, synthetic grease with excellent anti-corrosion/-rust properties, ideal for exposed, environmentally-sensitive marine/industrial applications and, even, off-road farming and earthmoving equipment. It will, equally, provide for superior, stress-free lubrication of roller/slide bearings, conveyor and drive chains, steel ropes, cables, stabilizers, water turbine guide vane bearings and screw pumps in either sea-going vessels or rigs and wastewater/water treatment plants, for example.

NLGI 2:DIN 51825 KPE2K-30; ISO 6743/9 L-X-CCIB2; OECD 301-B Biodegradability >60%; EPA 2013 VGP-compliant

CODE	GRADE/NLGI	PACKAGING
JG14531	2	DRUM 180KG
JG14536	2	15KG (PAIL)

INNOVA™ SYNCOMPLEX/FG-HT

Very high performance, aluminum complex-thickened, synthetic grease enforced with PTFE (Teflon®), ideal for high temperature (well above 180°C) applications in the foodgrade industry, such as in conveyor belts and chains, bakery/brick oven equipment, wafer baking equipment, film strething tenders or plant high-temp fans and vacuum pumps or, even, the glass industry, kiln truck wheels, load rollers in copying machines and textile dryers.

NLGI 2: DIN 51825 KPHCF2P-50; ISO 6743/9 L-X-EEHB2; NSF H1

CODE	GRADE/NLGI	PACKAGING
JG11036	2	15KG (PAIL)
JG11042	2	12X0,4KG

INNOVA™ SYNCOMPLEX/FG-LT

Long service, EP-enhanced, anhydrous calcium-thickened, fully synthetic grease, specifically intended for the lubrication of bearings, sliding mechanisms and equipment operating in extremely low temperarure environments in the foodgrade/ food processing and beverage industries, such as industrial freezers and chillers, fans and refrigerating compressors, "cold room" control equipment, small electric motors and robots. It is equally ideal for use in the pharmaceutical and cosmetics/personal care industries.

NLGI 1: DIN 51825 KPHC1H-60; ISO 6743/9 L-X-ECHB1; NSF H1

CODE	GRADE/NLGI	PACKAGING
JG11536	1	15KG (PAIL)
JG11542	1	12X0,4KG

INNOVA™ COMPLEX/FG-GL

Performance, water-resistant, clean, non-toxix, calcium sulphonate complex-thickened, grease enforced with EP/AW additives, suitable for the general lubrication of bearings, bushings and linkages of all kinds of food processing equipment, e.g. bakery equipment, food processing equipment, multi-pack cassette bearings, wrapping machines, conveyor bearings, bottling machines support equipment, trolleys, etc.

NLGI 2: DIN 51825 KP2N-20; ISO 6743/9 L-X-BDHB2; NSF H1

CODE	GRADE/NLGI	PACKAGING
JG12036	2	15KG (PAIL)
JG12042	2	12X0,4KG

PREMUS™ MLB

Premium, high performance, lithium-soaped grease, enhanced with EP/AW additives and MoS_2 for heavily-loaded, harsh (i.e. in the presence of water, dust, sludge or mud) applications requiring extremely high wear and friction control and water resistance. Highly recommended for suspension or steering joints, fifth wheels, slow-running bearings, open gears, etc. to be found in construction sites, earthworks or quarries.

NLGI 2: DIN 51825 KPF2K-25; ISO 6743/9 L-X-CCHB2

CODE	GRADE/NLGI	PACKAGING
JG06531	2	DRUM 180KG
JG06536	2	15KG (PAIL)

PREMUS™ GRF

Premium, heavy duty, lithium-soaped grease, enhanced with extreme pressure additives and graphite with excellent thermal/mechanical stability, providing for outstanding dry lubrication (i.e. when/if the lubricant base of the grease is removed) to all types of loaded/ shocks-subjected bearings and mechanisms (e.g. pump vanes, steam traps) operating under high temperatures or/and low/high speeds.

NLGI 2: DIN 51825 KPF2K-25; ISO 6743/9 L-X-CCEB2

CODE	GRADE/NLGI	PACKAGING
JG06031	2	DRUM 180KG
JG06036	2	15KG (PAIL)

PREMUS™ LEP

Premium quality, multipurpose, smooth-textured lithium-soaped grease, enhanced with extreme pressure additives, with excellent anticorrosion properties and very high thermal/mechanical stability, suitable for all types of loads/shocks-subjected plain and roller bearings of a wide range of machinery/mechanisms to be found in automotive, off-road/farming, industrial, railroad and marine environments.

NLGI 2: DIN 51825 KP2K-25; ISO 6743/9 L-X-CCHB2
NLGI 3: DIN 51825 KP3K-25; ISO 6743/9 L-X-CCHB3

CODE	GRADE/NLGI	PACKAGING
JG05031	2	DRUM 180KG
JG05036	2	15KG (PAIL)
JG05042	2	12X0,4KG
JG05531	3	DRUM 180KG
JG05536	3	15KG (PAIL)

PREMUS™ AUTO

Premium quality, smooth-textured lithium-soaped semifluid grease, enhanced with extreme pressure additives with excellent anticorrosion properties and thermal/mechanical stability, ideal for use in central lubrication systems or for chassis lubrication of road/off-road vehicles and equipment operating in the farming, construction, industrial and, even, marine sectors.

NLGI 00: DIN 51826 GP00H-20; ISO 6743/9 L-X-BBEB00

CODE	GRADE/NLGI	PACKAGING
JG13536	00	15KG (PAIL)
JG13538	00	4X4KG

PREMUS™ LI

Premium quality, multipurpose, smooth-textured lithium grease with excellent anticorrosion properties and efficient thermal/mechanical stability, suitable for all types of plain and roller bearings of a wide range of machinery/mechanisms to be found in automotive, off-road/farming, industrial and marine environments.

NLGI 2: DIN 51825 K2K-25; ISO 6743/9 L-X-CCHA2
NLGI 3: DIN 51825 K3K-25; ISO 6743/9 L-X-CCHA3

CODE	GRADE/NLGI	PACKAGING
JG04031	2	DRUM 180KG
JG04036	2	15KG (PAIL)
JG04038	2	4X4KG
JG04531	3	DRUM 180KG
JG04536	3	15KG (PAIL)
JG04538	3	4X4KG

PREMUS™ COT

Special, green/blue-ish, lithium-thickened, semifluid grease intended for the lubrication of cotton pickers, enhanced with anti-rust and anti-corrosion additives. It is ideal for low temperature processes.

NLGI 00: DIN 51826 GP00H-20; ISO 6743/9 L-X-BBEB00

CODE	GRADE/NLGI	PACKAGING
JG03531	00	DRUM 180KG
JG03536	00	15KG (PAIL)

PREMUS™ LI-CA

Premium quality, versatile, multipurpose, mixed soap grease, insolube in water with excelent mechanical and thermal stability, ideal for the lubrication of bearings and mechanisms in harsh automotive (heavy duty/off-road) and industrial environments where vapour, water, dust, mud and elevated temperatures are a common burden.

NLGI 1: DIN 51825 K1K-20; ISO 6743/9 L-X-BCEA1
NLGI 2: DIN 51825 K2K-20; ISO 6743/9 L-X-BCEA2
NLGI 3: DIN 51825 K3K-20; ISO 6743/9 L-X-BCEA3

CODE	GRADE/NLGI	PACKAGING
JG01531	1	DRUM 180KG
JG01536	1	15KG (PAIL)
JG01538	1	4X4KG
JG02031	2	DRUM 180KG
JG02036	2	15KG (PAIL)
JG02038	2	4X4KG
JG02042	2	12X0,4KG
JG03031	3	DRUM 180KG
JG03036	3	15KG (PAIL)
JG03038	3	4X4KG

PREMUS™ CY-WR/OG

Heavy duty, water-resistant, tacky grease with enhanced load-carrying capabilities for humid/damp/wet shore and offshore applications, e.g. in wire ropes, slides, cranes chassis, open gears, pressure blocks and screws, nuts, splines, water pumps etc.

NLGI 2: DIN 51502 OGF2E-20; ISO 6743/9 L-X-BBHA2

CODE	GRADE/NLGI	PACKAGING
JG14031	2	DRUM 180KG
JG14036	2	15KG (PAIL)

PREMUS™ CA

Highly mechanically stable, adherent, water-resistant, anhydrous calcium-soaped grease of excellent anti-corrosion/-rust properties and enhanced dropping point/maximum operating temperatures, intended for general lubrication use in moderate to harsh (mud, dust, water, seawater) automotive, industrial and offshore environments.

NLGI 2: DIN 51825 K2E-20; ISO 6743/9 L-X-BBBA2
NLGI 3: DIN 51825 K3E-20; ISO 6743/9 L-X-BBBA3

CODE	GRADE/NLGI	PACKAGING
JG00531	2	DRUM 180KG
JG00536	2	15KG (PAIL)
JG00538	2	4X4KG
JG01031	3	DRUM 180KG
JG01036	3	15KG (PAIL)
JG01038	3	4X4KG

PREMUS™ BNT

Specialised grease formulated with high viscosity base fluids and inorganic clay (bentonite), suitable for applications submitted to frequent cycles of high and low temperatures as well as in constant high temperature conditions going beyond 150°C. It is, in particular, recommended for electrical motor bearings on very hot ventilation systems.

NLGI 2: DIN 51825 K2P-20; ISO 6743/9 L-X-BEAA2

CODE	GRADE/NLGI	PACKAGING
JG13031	2	DRUM 180KG
JG13036	2	15KG (PAIL)

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