

Lubrication solutions for industrial applications



TOTAL



TOTAL Lubricants: our commitment



Total, a multinational energy company

As the fifth largest publicly-traded integrated oil and gas company in the world* and a major player in the chemicals business, Total has operations on five continents with approximately 96,000 employees.

Total engages in all aspects of the petroleum industry, including Upstream operations (oil and gas exploration, development and production, LNG) and Downstream operations (refining, marketing and the trading and shipping of crude oil and petroleum products). Total also produces base chemicals (petrochemicals and fertilizers) and specialty chemicals for the industrial and consumer markets (rubber processing, adhesives, resins and electroplating).

Total is helping to secure the future of energy by progressively expanding its energy offerings and developing complementary next generation energy activities (solar, biomass, nuclear).

Total's main challenges as an industrial company are to sustainably develop energy supply, ensure the safety of operations and reduce their environmental footprint, help fight against climate changes, respect and promote human rights, and contribute to the development of host countries.

* based on market capitalization (in dollars) as of December 31, 2012.



Developing your productivity

We are at your side to help you get the best of your machinery and to accompany your development at both local and international levels.

Total Lubricants is ISO 9001 and ISO/TS 16949 certified. These certifications, renewable every 3 years, are the guarantee of our long-term commitment.

■ Specific products

Each industrial sector has a specific operating environment. Our knowledge and experience of industrial applications means that our products are suited perfectly to your requirements. TOTAL lubricants offer a comprehensive range of oils, greases and special products for industries such as: chemicals, energy, iron and steel, metallurgy, metalworking, automotive, equipment manufacturers, mines, construction materials, papermaking and the food processing industry.

■ Innovative products

Innovation is priority for us. We have several research centres, where chemical and mechanical engineers and specialists in tribology work together. Our close relations with equipment manufacturers enable the formulation and testing of tomorrow's products, and guarantee optimal performance and protection of your machines.

■ Safe and environmentally-friendly products

We have made a commitment to safety, health and respect for the environment. Our R&D teams integrate from the initial design stage of new products parameters conducive to the reduction of toxicity risks and VOC emissions, biodegradability, recycling or disposal of the products.

■ High added value services

We bring our expertise to help you to optimize the productivity of your machinery and improve your competitiveness. You benefit from our specialist knowledge and high-level after-sales services that include: rationalization and organization of lubrication operations, maintenance and laboratory analyses of the fluids in service, training of your personnel.

■ Proximity and reactivity

We provide a local sales presence to answer your specific needs. In addition, our integrated organization and supply chain (our own refineries, lubricant blending plants and logistics platforms) ensure your deliveries will be on-time.

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Total Lubrifiants S.A. reserves the right to change without notice the formulation of its products, in order to improve their performances or adapt them to the legislation. We advise you to contact us for the choice of the product suitable to your operating environment. For further information see the Technical Data Sheets and the Material Safety Data Sheets.

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Proper organisation of maintenance and regular monitoring of the state of your machines guarantee optimal availability of your production tool and enable significant reductions in maintenance costs. For this reason Total has developed the **TIG XP5** software and the in-service oil analyses known as **ANAC INDUS**.

TIG XP5	
Software for efficient management of your maintenance and lubrication operations	
TIG XP5 is available in 3 versions in order to adapt to the specificities of other industrial sectors.	TIG XP5 software enables you to plan your lubrication and maintenance operations, and to keep very tight control of costs. <ul style="list-style-type: none"> • Organisation of preventive maintenance: planning of maintenance operations and tracking of their history. • Incorporation of conditional maintenance methods: oil analyses, vibration analyses, etc. • Organisation of corrective maintenance: scheduling repairs. • Direct importation of comments and results of ANAC analysis. • Management of lubricant stocks and spare parts: consumption, orders, deliveries. • Analysis of complete maintenance costs: cost of lubricants, spare parts and labour. • Integrated document management. • Possibility of managing the maintenance of several sites. • Software available in 13 languages.
	TIG XP5 <ul style="list-style-type: none"> • Management of preventive, conditional and corrective maintenance.
	TIG XP5 FOOD dedicated to the agrifood industries. <ul style="list-style-type: none"> • TIG XP5 functionalities + Integrated management of the HACCP method of risk analysis. + Management of the NSF H1 registered lubricants, designed for incidental contact with food.
	TIG XP5 METALWORKING dedicated to the metalworking industries. <ul style="list-style-type: none"> • TIG XP5 functionalities + Monitoring of the quality of the soluble oil sumps by triggering and storage of the measurement readings (concentration, pH, proportion of bacteria, ...). + Module dedicated to the management of top-ups: history and calculation of top-ups. + Management of cutting tools: analysis of the service life depending on the concentrate used and its concentration rate.

ANAC INDUS - ANAC - SOLUBLE CHECK

Oil analyses to anticipate and diagnose anomalies in the production chain

Oil condition is one of the key indicators to the condition of any machine. For this reason the quality and precision of the **ANAC INDUS** analyses provide tangible benefits as regards productivity gains and reduced maintenance and lubrication costs:

- Machine and lubricant condition monitoring without productivity loss due to unscheduled maintenance and downtime.
- Detection of anomalies: premature wear of a machine part, pollution (water, mixture of products, solid pollutants, dust, ...).
- Optimization of the lubricant use by maximising oil change intervals.

A PERSONALIZED DIAGNOSIS OF YOUR OILS IN SERVICE

- **ANAC INDUS**: analysis grids adapted to the various families of industrial oils:
 - CLASSIC: general analysis for industrial oils, hydraulics, bearings, compressors and gears.
 - TURBINE: turbine oils.
 - FRIGO: refrigerating machine compressors oils.
 - TRANSFO: transformer oils.
 - CALO: heat transfer oils.
 - TREMPE: quench oils.
- **ANAC**: specific analysis:
 - ANAC EXPERT: in depth, personalized diagnosis system for engines, gearboxes and other driveline components.
 - ANAC COOLANT: the diagnosis of cooling liquids.
 - ANAC GAS: in-depth diagnosis system for the follow up of the behaviour and depletion of the lubricant and the mechanical wear condition of industrial gas engines.
- Optional analyses linked to a grid:
 - VI: determination of the viscosity index.
 - OPTIC: microscopic analysis defining the nature and relative size of solid particles.
 - AIR: determination of the foaming and air release values.
 - LNF Partic: counting of particles in order to determine class of pollution.
- Analysis of soluble cutting fluids
 - **SOLUBLE CHECK**

A QUICK AND SECURE ACCESS TO YOUR OIL ANALYSIS

The ANAC website offer a personalized and safe access to your oil analysis results :

- Look up the results immediately after the analysis is completed.
- Download of diagnosis history, enables identification of changes in machine performance or condition.
- Transfer directly the results and comments in the TIG XP5 software, in order to effectively plan your maintenance operations.

TRAINING

Programs of discovery and improvement to make good use of industrial lubricants

Competitiveness, safety of installations, the health of people and respect for the environment are major challenges for all industries. The lubricant plays a major role in all these fields: when it is properly used, it contributes to the performance and longevity of the production tools, to the safety of goods, to the health of its users and to the protection of the environment. For this reason Total offers training to users of its lubricants that is specific to each industrial sector.

Topics: the use of industrial lubricants, safety and the environment

- controlling and identifying ... means better lubrication,
- knowledge and understanding ... means reducing risk,
- applying and choosing ... means limiting environmental risks.

Total Lubrifiants is an accredited training provider. All of our vocational training fall within the framework and French guidelines required for vocational training.

PISTON ENGINES LUBRICANTS

PRODUCT	APPLICATIONS	SAE GRADE	SPECIFICATIONS
AERO 80	<ul style="list-style-type: none"> Pure mineral oils for the lubrication of piston engines operating under average conditions. Lubrication of vintage aeroplanes (WWI and WWII warplanes). 	40	FRANCE: AIR 3560/D • US, UK: SAE J 1966
AERO 100		50	
AERO 120		60	
AERO D 80	<ul style="list-style-type: none"> Ashless dispersive monograde mineral oils for the lubrication of piston engines operating under severe and very severe conditions. 	40	FRANCE : AIR 3570 • US, UK : SAE J 1899
AERO D 100		50	
AERO D 120		60	
AERO XPD 80	<ul style="list-style-type: none"> New generation ashless dispersive monograde mineral lubricants, specially developed to improve anti-wear and corrosion protection of your highly valued piston aviation engine. These oils already contain an anti-wear additive similar to TEXTRON Lycoming LW 16702. 	40	FRANCE: AIR 3570 • US, UK: SAE J 1899 • FAA approved AD 80-04-03R2 paragraph b.1. • AVCO LYCOMING (301F) approved
AERO XPD 100		50	
AERO XPD 120		60	
AERO DM 15W-50	<ul style="list-style-type: none"> Ashless dispersive multigrade oils for the lubrication of piston engines operating under severe and very severe conditions. Can be used throughout the year in any climate. These oils already contain an anti-wear additive similar to TEXTRON Lycoming LW 16702. 	15W-50	French Air Force approved (n°30330 STPA/MA) • SAE J 1899 • FAA approved AD 80-04-03R2 paragraph b.1. • AVCO LYCOMING (301F) and TELEDYNE CONTINENTAL (MHS-24) approved.
AERO DM 20W-60		20W-60	

TURBINE ENGINES LUBRICANTS

PRODUCT	APPLICATIONS	VISCOSITY*	SPECIFICATIONS
AEROTURBINE 331	<ul style="list-style-type: none"> Mineral oil for lubrication of aviation turbine engines. Bearings and gearboxes. 	15	FRANCE: AIR 3515/B Iss.3 • UK: DEF-STAN 91-99 Iss. 2 • Joint Service Designation: OM-11 • NATO code: O-135 • Turbomeca approved
AEROTURBINE 921		65	

GEAR OILS

PRODUCT	APPLICATIONS	VISCOSITY*	SPECIFICATIONS
AEROGEAR 823	<ul style="list-style-type: none"> Mineral oil for highly stressed gearboxes such as helicopter gearboxes. 	66	FRANCE: DCSEA 255/A • US: MIL-PRF-6086E (medium grade) • UK: DEF STAN 91-112/1 • Joint Service Designation: OEP-70 • NATO code: O-155 • EUROCOPTER approved
AEROGEAR 1032	<ul style="list-style-type: none"> Mineral oil for highly stressed gearboxes such as the latest generation of Eurocopter helicopter gearboxes. 	60	US: MIL-PRF-6086E (medium grade) • UK: DTD 581 C grade OEP-70 • Joint Service Designation: OEP-70 • NATO code: O-155 • EUROCOPTER ECS 2199 approved

HYDRAULIC FLUID

PRODUCT	APPLICATIONS	VISCOSITY*	SPECIFICATIONS
AEROHYDRAULIC 520	<ul style="list-style-type: none"> Hydraulic systems operating under: <ul style="list-style-type: none"> - high pressure, - low and extremely low temperatures. 	14	FRANCE: DCSEA 415/A (H-520) • US: MIL-PRF-5606H • UK: DEF STAN 91-48/1, standard grade • Joint Service Designation: OM-18 • NATO Code: H-520

ENGINE PROTECTION LUBRICANT

PRODUCT	APPLICATIONS	VISCOSITY*	SPECIFICATIONS
AEROPROTECTIVE 219	<ul style="list-style-type: none"> Internal protective mineral oil for piston engines. 	-	FRANCE: AIR 1503/B type A • UK: DEF STAN 91-40/2 • Joint Service Designation: PX-27 • NATO code: C-615

This product list is non-exhaustive. Please contact us to learn about synthetic turbine engines lubricants, hydraulic fluids and greases.

* Typical kinematic viscosity at 40 °C in mm²/s

TOTAL hydraulic fluids meet the requirements of international standards and manufacturers' technical specifications. Our ranges of products correspond to the classifications of the ISO 6743-4 standard:

- HM class: **AZOLLA**. Mineral fluids with good oxidation stability ensuring anticorrosion and anti-wear protection of the equipment.
- HV class: **EQUIVIS** and **HYDROFLO**. HM properties complemented by a high viscosity index, for use of the fluid over a wide temperature range that permits start-ups at low temperature.
- HETG, HEES classes: **BIOHYDRAN**. Biodegradable fluids recommended for equipment used in sensitive natural areas so as to limit the impact of incidental discharges on the environment.

- HFA, HFC, HFD classes: **HYDRANSAFE**. Fluids specifically developed to limit the risks of a fire spreading in the event of a leak.

The **NEVASTANE** range is specially designed for the agrifood industry and its related activities such as the manufacture of packaging. It is also used in the pharmaceutical and the cosmetics industry.

All **NEVASTANE** products are NSF H1 registered. Their use is essential when a high level of hygiene is required, in compliance with HACCP method. As high-performance products, they provide equipment protection and extended service life while securing the production chain.

NEVASTANE hydraulic fluids are available in HM and HV class.

HM HYDRAULIC FLUIDS: FOR HIGH TEMPERATURES AND PRESSURES


PRODUCT	APPLICATIONS	SPECIFIC ADVANTAGES	ISO VG	SPECIFICATIONS
AZOLLA ZS	<ul style="list-style-type: none"> • Hydraulic systems operating in high temperature and pressure conditions. • Bearings and miscellaneous devices. 	Reinforced protection of the equipment thanks to anti-wear and anticorrosion properties. Considerable service life for the fluid and preventing deposits, ensured by thermal stability and resistance to oxidation. Filterability even in the presence of water.	10 to 150	ISO 11158 HM • DIN 51524-2 HLP Eaton I-286S, M-2950S • Denison HF0, HF1, HF2
AZOLLA AF	<ul style="list-style-type: none"> • Hydraulic systems especially sensitive to the formation of deposits and/or operating in high temperature and pressure conditions. • Bearings and miscellaneous equipment. 	Formation deposits prevented due to ashless additives. Very good anti-wear and thermal stability performances. Very good filterability in service even in the presence of water. Extension of oil drain intervals. TOST = 4000 hours.	22 to 100	ISO 11158 HM • DIN 51524-2 HLP Eaton I-286S, M-2950S • Denison HF0, HF1, HF2
AZOLLA DZF	<ul style="list-style-type: none"> • All hydraulic systems, in particular when the presence of water is inevitable and the draining of water impossible. • Miscellaneous devices calling for extreme-pressure properties. 	Excellent hydrolysis stability thanks to ashless additives. Detergent fluid preventing deposits in the circuits. Reinforced extreme-pressure properties.	10 to 68	ISO 11158 HM • ISO 12925 CKC • DIN 51524-2 HLPD Müller Weingarten • MAN N698 HLPD
AZOLLA AL	<ul style="list-style-type: none"> • Hydraulic systems of aluminium, stainless steel or copper rolling mills. 	Synthetic oil avoids staining rolled metal in the event of a leak in the hydraulic circuit. Reduction in the formation of deposits. Anticorrosion protection even in the presence of water.	15 to 68	-
AZOLLA VTR	<ul style="list-style-type: none"> • Hydrokinetic transmissions and couplings. • Specially designed for turbo-transmissions, Voith Turbo gear boxes. 	Dispersant and detergent fluid limiting deposits. Very good load capacity (FZG>12) and anti-wear protection. Thermal stability. Very low foaming.	32	ISO 6743-4 HM • DIN 51524 HLPD Voith Turbo • SNCF
NEVASTANE AW	<ul style="list-style-type: none"> • Hydraulic systems operating under severe conditions. 	Very good equipment protection power. Increased equipment service life. Miscibility with mineral fluids.	22 to 68	NSF H1 • Kosher • Halal ISO 6743-4 HM • ISO 21469

HV HYDRAULIC FLUIDS: FOR LOW TEMPERATURES




PRODUCT	APPLICATIONS	SPECIFIC ADVANTAGES	ISO VG	SPECIFICATIONS
EQUIVIS ZS	<ul style="list-style-type: none"> • Hydraulic systems operating outdoors. 	Extension of oil drain intervals due to very good thermal stability and resistance to oxidation. Very good filterability even in the presence of water.	15 to 100	ISO 11158 HV • DIN 51524-3 HVLP Vickers • Cincinnati-Milacron P68, P69, P70
EQUIVIS AF	<ul style="list-style-type: none"> • Hydraulic systems operating outdoors. 	Extension of oil drain intervals. Improved shear stability.	32 to 68	ISO 11158 HV DIN 51524 HVLP
EQUIVIS HE	<ul style="list-style-type: none"> • Hydraulic systems operating under high temperature and pressure conditions. • Hydraulic systems operating outdoors. 	Energy savings up to 5%. Extension of drain intervals due to a very good thermal stability and resistance to oxidation. Outstanding shear stability. Very good filterability.	32 46 68	ISO 11158 HV • DIN 51524-3 HVLP • DENISON HF0
EQUIVIS XV	<ul style="list-style-type: none"> • Hydraulic systems operating at low temperatures as far down as -30 °C. 	Protection of equipment due to a viscosity index > 250, ensuring limitation of cavitation phenomena in circuits during start-up phases and maintenance of lubricant film thickness at elevated temperatures.	32 46	-

NSF H1, suitable for incidental food contact


■ ■ ■ HV HYDRAULIC FLUIDS: FOR LOW TEMPERATURES

PRODUCT	APPLICATIONS	SPECIFIC ADVANTAGES	ISO VG	SPECIFICATIONS
EQUIVIS XLT	<ul style="list-style-type: none"> Hydraulic systems operating at extremely low temperatures as far down as -40 °C. 	Enhanced protection due to a viscosity index of 350. Prevention of deposits due to ashless additives. Excellent filtration properties even in the presence of water. Extended service life of the fluid. TOST = 4000 hours.	15 to 32	-
HYDROFLO CT	<ul style="list-style-type: none"> Hydraulic systems operating outdoors 	Enhanced protection and performance of the equipment. Allows extension of oil drain intervals. Blue coloring enabling detection of possible leaks in equipment.	46	DIN 51524-3 HVLP Poclain Hydraulics • Denison HF0, HF1, HF2
 NEVASTANE SH	<ul style="list-style-type: none"> Hydraulic systems and particularly those operating at low temperatures. 	High-performance product, due to its 100% synthetic composition. Excellent protection of equipment. Extension of oil drain intervals.	32 to 100	NSF H1 • Kosher • Halal ISO 6743-4 HV • ISO 21469

BIODEGRADABLE HYDRAULIC FLUIDS

PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	ISO VG	SPECIFICATIONS
 BIOHYDRAN FG	Biodegradable Vegetable esters, suitable for incidental contact with food	<ul style="list-style-type: none"> Hydraulic systems operating outdoors. Operating temperatures: -20 °C to +70 °C. 	Reinforced protection and efficiency of equipment. Excellent anti-wear properties.	46	NSF H1 ISO 15380 HETG
 BIOHYDRAN TMP	Biodegradable Synthetic esters	<ul style="list-style-type: none"> Hydraulic systems operating outdoors. Optimal operating temperatures: -20 °C to +80 °C. 	Excellent protection against wear and corrosion. Protection and efficiency of equipment. Miscible with mineral oils.	32 to 100	ISO 15380 HEES European Ecolabel Swedish Standard SS 15 54 34
 BIOHYDRAN SE	Biodegradable Saturated synthetic esters	<ul style="list-style-type: none"> Hydraulic systems operating outdoors. Operating temperatures likely to exceed +80 °C. 	Extension of oil drain intervals due to high thermal stability. Excellent compatibility with elastomers.	32 to 68	ISO 15380 HEES European Ecolabel Swedish Standard SS 15 54 34 DENISON HF1, HF2, HF6 Sauer Danfoss

FIRE-RESISTANT HYDRAULIC FLUIDS

PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	ISO VG	SPECIFICATIONS
HYDRANSAFE HFA E3	Concentrate soluble in water	<ul style="list-style-type: none"> Hot pressing machines and systems specially designed for low-viscosity aqueous fluids. Operating temperatures: +5 °C to +55 °C. 	Generation of a stable fire resistant emulsion based hydraulic oil. Good filtration properties. Resistant to bacterial growth.	-	ISO 6743-4 HFAE • ISO 12922
HYDRANSAFE HFA S5	Synthetic concentrate soluble in water	<ul style="list-style-type: none"> Hot pressing machines and systems specially designed for low-viscosity aqueous fluids. Operating temperatures: +5 °C to +55 °C. 	Generation of a stable fire resistant solution. Excellent filtration properties. High resistant to bacterial growth.	-	ISO 6743-4 HFAS • ISO 12922
HYDRANSAFE HFC 146	Ready to use	<ul style="list-style-type: none"> Operating temperatures: -20 °C to +60 °C. 	Fire resistant fluid containing a high proportion of water. Adapted to low temperatures.	46	ISO 6743-4 HFC Danieli • Müller Weingarten
 HYDRANSAFE HFDU	Ready to use	<ul style="list-style-type: none"> Recommended in the event of incidental leaks into the environment. Operating temperature: -10 °C to +70 °C on a continuous basis, +120 °C at peak periods. 	Excellent fire resistance. Ultimate biodegradability (OECD 301B). Excellent anti-wear properties. Miscible with mineral oils.	46 68	ISO 6743-4 HFDU Factory Mutual • Danieli
HYDRANSAFE HFDU LC 168	Ready to use	<ul style="list-style-type: none"> Operating temperature: -10 °C to +70 °C on a continuous basis, +120 °C at peak periods. 	Excellent fire resistance. Anti wear properties.	68	ISO 6743-4 HFDU
HYDRANSAFE FRS	Ready to use	<ul style="list-style-type: none"> Operating temperature: -10 °C to +70 °C on a continuous basis, +150 °C at peak periods. 	Excellent fire resistance. Absence of deposits. Protection against corrosion.	32 46	ISO 6743-4 HFDR • ISO 12922

SERVICE PRODUCTS

AZOLLA NET HC: Detergent additive to be added to the hydraulic fluid for cleaning of the hydraulic systems prior to oil drain.

BLUE CONCENTRATE: Blue dye for hydraulic fluids and other mineral lubricants, enabling early detection of leaks.

BIOFLUSH 22: cleaning oil to switch from a mineral oil to a biodegradable saturated synthetic esters fluid.


CARTER, KASSILA and **NEVASTANE** oils are designed for the lubrication of gears.

Numerous parameters need to be taken into account when choosing a gear lubricant:


- The type of gear: dimensions, metallurgy of the toothing, sliding characteristics and speed reducing ratio, open or closed casing.
- The operating conditions: depending on load, vibration and shock levels, the anti-wear and extreme-pressure properties determine the choice of lubricant.
- The temperature of oil in service: very low, moderate between +20 °C and +80 °C, hot at more than +80 °C, and extreme temperature exceeding +120 °C.
- The impact of the lubricant on the gears environment, in the event of leakage; in the event of leakage: biodegradability properties, suitability for incidental food contact or non-staining are necessary.

- The impact of the environment of the gear on the lubricant: in order to prevent corrosion and shorter fluid life due to humidity, dust or other elements, certain oils offer reinforced anticorrosion properties.
- The conditions of maintenance: a synthetic fluid offering a long oil drain interval and guaranteeing proper operating safety makes significant savings in maintenance costs.



The **NEVASTANE** range is specially designed for the agrifood industry and its related activities such as the manufacture of packaging. It is also used in the pharmaceutical and the cosmetics industry.

 All **NEVASTANE** products are NSF H1 registered. Their use is essential when a high level of hygiene is required, in compliance with HACCP method. As high-performance products, they provide equipment protection and extended service life while securing the production chain.


MINERAL GEAR OILS

PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	ISO VG	SPECIFICATIONS
CARTER ST	Mineral	<ul style="list-style-type: none"> • Industrial gears, bearings under high loads and moderate oil temperatures. 	Superior protection of gears and bearings due to reinforced extreme-pressure performances. Anticorrosion protection.	150 to 680	ISO 12925-1 CKC • DIN 51517-3 CLP
CARTER EP 68 - 1000	Mineral	<ul style="list-style-type: none"> • Industrial gears, bearings under high loads and high temperatures. 	Extension of oil drain intervals. Protection against micropitting.	68 to 1000	ISO 12925-1 CKD • DIN 51517-3 CLP • AGMA 9005-E02 EP U. S. Steel 224 • Flender
 NEVASTANE EP	White	<ul style="list-style-type: none"> • Gears, gear pumps, chains and conveyor belts. 	Superior protection under high loads. Adapted to a wide range of applications.	100 to 1000	NSF H1 • Kosher • Halal ISO 6743-6 CKD • ISO 21469
CARTER XEP	Mineral Top tier	<ul style="list-style-type: none"> • Gears under high loads, high temperatures and difficult environments. • Gears for wind turbines. 	Extended oil service life due to excellent thermal stability. Reinforcement of anticorrosion protection. Very good protection of bearings. Excellent protection of toothing against micropitting.	150 to 680	ISO 12925-1 CKD • DIN 51517-3 CLP • AGMA 9005-E02 EP U. S. Steel 224 • FAG • Flender
KASSILLA GMP	Mineral	<ul style="list-style-type: none"> • Industrial gears under very high loads and repeated shocks. • Adapted to severe conditions: cement plants, iron and steel industry, mines, crushing... 	Very good thermal stability. Reinforced protection against corrosion and micropitting. Contains graphite and molybdenum disulphide.	150 to 1000	ISO 12925-1 CKD • DIN 51517-3 CLP • AGMA 9005-E02 EP

SYNTHETIC GEAR OILS

PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	ISO VG	SPECIFICATIONS
CARTER SH	Synthetic PAO	<ul style="list-style-type: none"> • Gears subjected to very high loads and high temperatures in difficult environments. • Gears for wind turbines. 	Excellent protection against corrosion, wear and micropitting. Extended oil service life due to excellent thermal stability. Can operate outdoors thanks to a very low pour point.	150 to 1000	ISO 12925-1 CKD • DIN 51517-3 CLP Flender • FAG • SKF
 CARTER BIO	Synthetic ester	<ul style="list-style-type: none"> • Gears offering a risk of incidental discharges into the environment. 	Biodegradable product. Very good extreme-pressure, anti-wear and anticorrosion properties. Oxidation stability.	68 to 460	Equivalence ISO 12925-1 CKD • DIN 51517-3 CLP
CARTER SY	Synthetic PAG	<ul style="list-style-type: none"> • Industrial transmissions with a high slip rate. • Spur gears and worm screws. • Gears operating at very high temperatures. • Non-miscible with mineral oils and certain synthetic lubricants. 	Reinforced extreme-pressure properties. Very good thermal stability, good anticorrosion protection. Very low foaming.	150 to 680	ISO 12925-1 CKD/CKT • DIN 51517-3 CLP
 NEVASTANE XSH	Synthetic PAO	<ul style="list-style-type: none"> • Severe temperature conditions and high loads. • Gears, slideways, plain bearings and (roller) bearings. 	Excellent level of equipment protection. Extension of oil drain intervals. Extended equipment service life.	150 to 460	NSF H1 • Kosher • Halal ISO 6743-6 CKD • ISO 21469

■■■ SYNTHETIC GEAR OILS

PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	ISO VG	SPECIFICATIONS
 NEVASTANE SY	Synthetic PAG	<ul style="list-style-type: none"> Severe temperature conditions and high loads. Open chains and conveyor belts, bottling equipment, wheels and worm screws. Non-miscible with mineral oils and certain synthetic lubricants. 	Reinforced extreme-pressure properties. Very good thermal stability. Anticorrosion protection.	220 320 460	NSF H1

SPECIAL OILS

PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	ISO VG	SPECIFICATIONS
CARTER EP 1500, 2200, 3000	Semi-synthetic	<ul style="list-style-type: none"> Slow gears. In particular, oven rings and crusher trains. 	Great load capacity thanks to excellent extreme-pressure and anti-wear properties. Protection against shocks and corrosion.	1500 2200 3000	ISO 12925 CKC • DIN 51517-3 CLP (grade 1500) • AGMA 9005-E2, NF-F19-809
CARTER MS 100	Very high-viscosity bitumens	<ul style="list-style-type: none"> Open gears. 	Reinforced extreme-pressure properties. Superior adhesiveness. Resistance to water and anticorrosion protection.	6800	ISO 6743-6 CKJ
CARTER ENS 400 CARTER ENS/EP 700	Very high-viscosity bitumens	<ul style="list-style-type: none"> Open gears or gears in leaky casings rotating at slow speed. Ring gears, slideways. Lubrication of cables and metal chains. 	Low viscosity solvent allows possible application at ambient temperatures. CARTER ENS/EP 700 is available as an aerosol.	Kinematic viscosity at 100 °C of the dry extract: 400 and 700 mm ² /s	ENS 400: ISO 6743-6 CKH-DIL ENS/EP 700: ISO 6743-6 CKJ-DIL
CARTER ALS	Non-staining	<ul style="list-style-type: none"> Gears in aluminium seam casings: cylindrical gear pairs, bearings and couplings. Spur gears and worm screws. 	Non-staining of aluminium. Excellent protection of lubricated parts. Resistance to corrosion even in the presence of water.	220 460	-

REFRIGERATING COMPRESSORS

Depending on the type of refrigerant, **LUNARIA** and **PLANETELF** fluids are designed to match broad usage conditions.

In all cases, they ensure excellent lubrication performances as well as:

- Anti-wear and anti-foaming properties.

- Low formation of deposits.
- Excellent thermal and chemical stability.
- Return of the lubricant to the compressor.

PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY*	SPECIFICATIONS
LUNARIA EFL	Synthetic PAG endcapped	• Automotive air conditioning systems, heat pumps and industrial refrigeration using CO ₂ .	Specific for CO ₂ applications.	46 to 68	ISO 6743-3 DRF
LUNARIA FR	Naphthenic mineral oil	• Refrigerating compressors using CFC, HCFC and NH ₃ as a refrigerant.	Evaporating temperature > -15 °C.	32 to 100	ISO 6743-3 DRA APV • Bock • Bitzer • Gram • Carrier • Grasso • Howden • J & E Hall • Sabroe • York
LUNARIA NH	Hydrocracked mineral oil	• Refrigerating compressors using NH ₃ /ammonia.	Evaporating temperature > -30 °C.	46 68	ISO 6743-3 DRA APV • Gram • Bock • J & E Hall • Grasso • Howden • Sabroe • York
LUNARIA SH	Synthetic PAO	• Refrigerating compressors using NH ₃ /ammonia.	Evaporating temperature > -50 °C.	46 68	NSF H1 ISO 6743-3 DRA APV • Gram • Bock • J & E Hall • Grasso • Howden • Sabroe • York
LUNARIA SK	Synthetic alkyl benzene	• Refrigerating compressors using CFC or HCFC refrigerants.	Evaporating temperature > -60 °C.	55 to 150	ISO 6743-3 DRE APV • Bitzer • Bock • Sabroe • York • RefComp
PLANETELF ACD	Synthetic POE	• Refrigerating compressors using HFC refrigerants.	Evaporating temperature > -60 °C.	32 to 220	ISO 6743-3 DRD Aerzen • Bock • Frascold • Grasso • Howden • Sabroe • Sulzer • York
PLANETELF PAG 244 F	Synthetic PAG	• Car air conditioning compressors using R-134a (variable displacement).	Good compatibility behaviour and miscibility with R-134a. Specific packaging to limit the water absorption.	53	ISO 6743-3 DRD Ford (Visteon)
PLANETELF PAG 488	Synthetic PAG	• Car air conditioning compressors using R-134a (fixed displacement).		130	ISO 6743-3 DRD General Motors (Delphi GM Harrison)
PLANETELF PAG SP 20	Synthetic PAG	• Car air conditioning compressors using R-134a (fixed displacement; SANDEN compressors such as SD5H14, SD7H10, SD7H13, SD7H15/HD, SD7H15/SHD.)		100	ISO 6743-3 DRD Sanden

GAS COMPRESSORS

DACNIS LPG and **ORITES** oils are designed for the lubrication of gas compressors and hyper-compressor cylinders.

DACNIS LPG meets the constraints relating to the compression of hydrocarbon gases, including refrigeration applications.

ORITES TN 32 is a turbine quality mineral oil adapted to the lubrication of ammonia synthesis turbo-compressors.

ORITES DS, TW and **EDA** products are specifically formulated for hyper-compressor cylinders and satisfy the principal regulations in force for the production of polymers.

White oils and synthetic PAG oils provide to these products:


- Excellent solvent power and anti-wear properties.
- Long linings service life.
- Very good high pressure behaviour.
- Very high pump-ability level.

PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY*	SPECIFICATIONS
DACNIS LPG 150	Synthetic PAG	• Hydrocarbon gas compressors.	Resistant to dilution by hydrocarbon gases. Excellent chemical stability.	150	ISO 6743-3: DGC Sulzer-Burckhardt • Howden • Aerzen
ORITES TN 32	Mineral	• Ammonia synthesis gas turbo-compressors.	Excellent resistance to oxidation and air release properties. Chemically inert to ammonia thus avoiding deposits. Compatibility with elastomers.	32	Dresser-Rand • Thermodyn • Creusot-Loire • Rateau

NSF H1, suitable for incidental food contact

* Typical kinematic viscosity at 40 °C in mm²/s

■ ■ ■ GAS COMPRESSORS


PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY*	SPECIFICATIONS
ORITES DS 125	Synthetic PAG	<ul style="list-style-type: none"> Gas compressor cylinders. 	Resistance to dilution by hydrocarbon gases.	125	ISO 6743-3: DGC Sulzer-Burckhardt
 ORITES DS 270	Synthetic PAG	<ul style="list-style-type: none"> Lubrication of ethylene (hyper-)compressors cylinders for the production of low density polyethylene. 	Excellent lubricity.	270	NSF H1 ISO 6743-3: DGC • EU 2002/72/EC Burckhardt Compression
ORITES DS 270 X		<ul style="list-style-type: none"> Lubrication of ethylene (hyper-)compressors cylinders for the production of low density polyethylene and EVA. 	Resistant to corrosion.		
ORITES TW 220	White oil	<ul style="list-style-type: none"> Lubrication of ethylene (hyper-)compressors cylinders for the production of low density polyethylene. 	Excellent lubricity.	220	ORITES TW 220 is ISO 21469 certified
ORITES TW 220 X		<ul style="list-style-type: none"> Lubrication of ethylene (hyper-)compressors cylinders for the production of low density polyethylene and EVA. 	Resistant to corrosion.		
ORITES EDA 220		<ul style="list-style-type: none"> Hyper-compressor cylinders. For the production of EDA. 	Excellent lubricity.		
					ORITES EDA 220 is ISO 21469 certified


AIR COMPRESSORS

DACNIS oils are formulated in accordance with manufacturers' requirements to optimise the efficiency of air compressors.

- Oil drain intervals ranging from 2000 hours to as much as 8000 hours, under normal conditions of operation.
- Protection against wear and corrosion.
- Absence of carbonaceous deposits, even at high temperatures.
- Effective oil/air and oil/condensates separation.

The **NEVASTANE** range is specially designed for the agrifood industry and its related activities such as the manufacture of packaging. It is also used in the pharmaceutical and the cosmetics industry.

 All **NEVASTANE** products are NSF H1 registered. Their use is essential when a high level of hygiene is required, in compliance with HACCP method. As high-performance products, they provide equipment protection and extended service life while securing the production chain.


PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY*	SPECIFICATIONS
DACNIS	Mineral	<ul style="list-style-type: none"> Rotary and reciprocating air compressors. 	Oil drain interval 2000 hours.	32 to 150	Grades 32 to 68: ISO 6743-3 DAH • ISO DP 6521 Grades 100 and 150: ISO 6743-3 DAB • DIN 51 506 VDL Bauer • CompAir • Dresser-Rand • Sauer & Sohn • Sulzer Burckhardt...
DACNIS LD	Hydrocracked mineral	<ul style="list-style-type: none"> Rotary screw-type air compressors. 	Oil drain interval 4000 hours. Low pour point.	32 to 68	ISO 6743-3 DAJ • ISO DP 6521 • DIN 51 506 VDL Atlas Copco • CompAir • Hydrovane • Dresser-Rand...
DACNIS SH	Synthetic PAO	<ul style="list-style-type: none"> Rotary screw-type air compressors. 	Oil drain interval 8000 hours. Very low pour point.	32 to 100	ISO 6743-3 DAJ • ISO DP 6521 Atlas Copco • Hydrovane • CompAir • Dresser-Rand...
DACNIS SE	Synthetic ester	<ul style="list-style-type: none"> High-pressure reciprocating air compressors, rotary compressors and turbocompressors. 	High thermal stability. Low pour point.	46 to 100	ISO 6743-3 DAJ • DIN 51 506 VDL Atlas Copco • Bauer • CompAir • Dresser-Rand • Sauer & Sohn • Tanabe...
 NEVASTANE SH	Synthetic PAO	<ul style="list-style-type: none"> Air compressors. Adapted to the severe environment of the agrifood industries. 	Very high equipment protection level, even under severe conditions.	32 to 100	NSF H1 • Kosher • Halal ISO 6743-6 CKC • ISO 6743-4 HV • ISO 21469

VACUUM PUMPS

PV 100 oils are destined for the lubrication of rotary and reciprocating vacuum pumps. Their performance over time is guaranteed by the properties of the fluid:

- Less consumption of fluid due to low volatility

- Achievement of ultimate vacuum of the pumps, ensured by the low saturating vapour pressure of the lubricant.
- Constant tightness due to the very low variation of viscosity during the entire oil service life.
- Absence of product degradation and residue formation due to excellent oxidation resistance.

PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY*	SPECIFICATIONS
PV 100	Mineral	<ul style="list-style-type: none"> • Vacuum pump. • Extraction of neutral gas. 	-	125	ISO 6743-3 DVC
PV 100 PLUS	Mineral	<ul style="list-style-type: none"> • Vacuum pump. • Extraction of moist air. 	-	125	ISO 6743-3 DVC
 PV SH 100	Semi-synthetic	<ul style="list-style-type: none"> • Alternating and rotary vacuum pump. • Extraction of acid or corrosive gases. 	Suitable for incidental food contact.	100	NSF H1 ISO 6743-3 DVD


PNEUMATIC SYSTEMS

PNEUMA oils guarantee the performance of pneumatic equipment and enable reduced fluid consumption.

- Excellent resistance to shocks due to the extreme-pressure additives and good anti-wear protection.
- Water-repellent and antirust properties.

- Adhesiveness and tacky character, preventing pollution by oil mist.

PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY*	SPECIFICATIONS
PNEUMA	Mineral	Pneumatic tools: pneumatic shock engines, line lubricators or pulverisers for hammer drills.	Possible use in confined atmosphere: galleries, tunnels.	46 to 150	ISO 6743-11 P
PNEUMA SY	Synthetic	Soundproof pneumatic shock equipment.	Anti-icing. Use at very low temperature.	17	-

 NSF H1, suitable for incidental food contact

* Typical kinematic viscosity at 40 °C in mm²/s

TURBINES

PRESLIA oils are designed for the lubrication of hydraulic, gas, steam and combined-cycle turbines. Their formulation stems from long experience and meets manufacturers' severest specifications.

- Excellent resistance to oxidation permitting longer oil drain intervals.
- Foaming, air release and demulsification behavior, ensuring proper facility operations.
- Specific anti-wear and extreme-pressure additives that enable the gearing to withstand high loads.

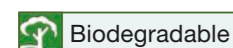
PRODUCT	NATURE	CHIEF APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY*	SPECIFICATIONS
PRESLIA	Mineral	<ul style="list-style-type: none"> • Hydraulic turbines. • Steam turbines. • Gas turbines. • Centrifugal compressor. 	Very good defoaming, air release and demulse properties. High level of protection against oxidation.	32 to 100	ISO 6743-5 THA/THE/TSA/TSE/TGA/TGB/TGE/TGSB ISO 8068 (ISO VG 32 & 46) - DIN 51515 (ISO VG 32 & 46) - ASTM D 4304 type I & II - JIS K-2213 type 2 w/add - GB 11120-89 L-TSA Alstom HTGD 90117 ALSTOM HYDRO HTWT 600050 • General Electric GEK 28143B, GEK 32568G, GEK 27070, GEK 46506E • MAN Diesel & Turbo SPD10000494596 • MAN Turbo SPD 10000242284 • Siemens TLV 901304, TLV 901305 • Solar ES 9-224 W Class II
PRESLIA GT	Hydrocracked mineral	<ul style="list-style-type: none"> • Steam turbines. • Gas turbines. • Combined-cycle turbines. 	Very high resistance to oxidation. Reinforced anti-wear and extreme-pressure additivation. Longer oil drain intervals.	32 46	ISO 6743-5 TSA/TSE/TGA/TGB/TGE/TGSB/TGSE ISO 8068 - DIN 51515 - ASTM D 4304 type I & II - JIS K-2213 type 2 w/add - GB 11120-89 L-TSA Alstom HTGD 90117 • General Electric GEK 28143B, GEK 32568G, GEK 107395A, GEK 101941A, GEK 27070, GEK 46506 E • MAN Turbo SPD 10000494596 • Siemens TLV 901304, TLV 901305 • Škoda turbíny Plzen • Solar ES 9-224 W Class II
PRESLIA SE JET	Synthetic ester	<ul style="list-style-type: none"> • Aero-derivative turbines. 	Excellent resistance at high temperatures.	25	MIL-PRF-23699F Allison Rolls Royce (USA) • General Electric • Rolls Royce (UK) • Turbomeca
BIOPRESLIA HT	Saturated synthetic esters	<ul style="list-style-type: none"> • Hydraulic power generation plant (turbines and hydraulic systems). 	Resistance to oxidation. Very good defoaming, air release and demulse properties. Good compatibility with elastomers. Biodegradable.	22 to 100	 www.total.com/en/total-ecosolutions

GAS ENGINES

NATERIA lubricants are detergent oils for gas engines and motor-compressors running on all types of fuel, from natural gas to highly corrosive landfill gas. As a result of long experience, the formulation of **NATERIA** lubricants complies with manufacturers' requirements by ensuring maximum engine protection.

- Longer oil drain intervals due to substantial reserve alkalinity.
- Thermal stability, resistance to oxidation and nitration.
- Considerable anti-wear and anticorrosion properties.
- Detergent and dispersant capacities that reduce the formation of deposits.

PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	SAE GRADE	SPECIFICATIONS
NATERIA MH	Mineral Ash content < 0.5% TBN: 5.5	<ul style="list-style-type: none"> • Natural gas engines. Can be used in cogeneration. 	Long life oil. Compatibility with catalytic converters.	40	GE-JENBACHER : TI 1000-1109, Caterpillar: series 3500 • MWM (DEUTZ): sulphate ash content up to 0.5 wt.% • Perkins: 4000 • Waukesha: APG 2000/3000 • Wärtsilä: 220 SG • MDE: 28XX, 30XX • MTU: natural gas
NATERIA MP	Mineral Ash content < 0.5% TBN: 4.6	<ul style="list-style-type: none"> • Natural gas engines, operating under severe conditions. 	Very long life oil. High-performing under severe conditions.	40	MWM (DEUTZ): sulphate ash content up to 0.5 wt.% • ROLLS-ROYCE: KG & BV-G • MTU: biogas
NATERIA X 405	Synthetic Ash content < 0.5% TBN: 5.2	<ul style="list-style-type: none"> • Natural gas engines, operating under very severe conditions. 	Extra long life oil. Increased yield due to very considerable reduction in the formation of deposits on the heat exchanger tubes.	40	Wärtsilä: 220 SG, 25 SG, 28 SG, 34 SG, 32 DF, 50 DF • Waukesha: APG 2000/3000



* Typical kinematic viscosity at 40 °C in mm²/s

■ ■ ■ GAS ENGINES

PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	SAE GRADE	SPECIFICATIONS
NATERIA MJ	Mineral Ash content < 1% TBN: 8.8	<ul style="list-style-type: none"> Natural gas and biogas engines: purification stations, liquid manure, landfill sites. 	Long life oil. Strengthened detergency.	40	MDE: 28XX, 30XX • MAN 3721-2: All types • MWM (Deutz): sulphate ash content from 0.5 to 1.0 wt.% • MTU: biogas
NATERIA ML 406	Mineral Ash content < 1% TBN: 6.1	<ul style="list-style-type: none"> Landfill gas engines with a controlled H₂S content. 	Long life oil. Neutralization of the acid compounds contained in the gas.	40	GE Jenbacher: Technical Instruction 1000-1109
NATERIA V	Mineral Ashless	<ul style="list-style-type: none"> 2-stroke and 4-stroke gas engines and motor-compressors. 	Compatibility with catalytic converters.	40	MIL-L-2104A Clark • Cooper-Bessemer • Ingersoll-Rand KVS

DIESEL ENGINES FOR STANDBY UNITS

PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	SAE GRADE	SPECIFICATIONS
DISOLA SGS	Detergent mineral	<ul style="list-style-type: none"> Diesel engines for standby units: hospitals, nuclear power plants, off shore units. 	Safe for emergency start-ups at full power. Excellent internal protection of the engine during shutdown periods due to anticorrosion additives.	40	MIL-L-2104 C • MIL-L-21260 C EDF PMUC

ELASTOMER DEMOULDING OILS

MOLDOL R oils are demoulding fluids for the elastomeric materials. The choice of product depends on the compatibility with the type of elastomer used.

PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY*	COMPATIBILITY WITH ELASTOMERS
MOLDOL RW 4926	Water-washable synthetic liquid	<ul style="list-style-type: none"> Demoulding of hollow elastomer objects. Specific application in car industry: demoulding of hoses. 	Biodegradability > 90% (CEC-L-33T82). No perceptible odour.	225	EPDM • PEC • PVC / Nitrile • FKM (Viton) • CR Neoprene • ECO • Vamac® • EVA
MOLDOL R 30413	Water-washable PAG synthetic liquid	<ul style="list-style-type: none"> Demoulding of hollow elastomer objects. Specific application in car industry: demoulding of hoses. 	PAG-base.	680	EPDM sulphurized • PVC / Nitrile • CR Neoprene
MOLDOL RW 4949	Water-washable synthetic gel		Biodegradability > 90% (CEC.L33.A94). No perceptible odour.	-	EPDM • PEC • PVC / Nitrile • FKM (Viton) • VMQ (Silicone) • CR Neoprene • Vamac® • EVA

HEAT TRANSFER FLUIDS

SERIOLA and **JARYTHERM** heat transfer fluids cover a wide variety of applications: heating of domestic and industrial premises, manufacturing processes in cement works, paper mills, chemical and plastics processing industries and installations combining heating and cooling cycles.

Whether they are mineral or synthetic base, **SERIOLA** and **JARYTHERM** fluids are characterized by:


- Great thermal stability, thereby preventing buildup of deposits and soot in systems.
- High heat exchange capacity which enables energy savings due to the reduced warm-up time of the installations.
- Long service life without degradation of the fluid even at process temperatures rising as high as +350 °C.

PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY*	SPECIFICATIONS
SERIOLA 320	Inhibited mineral	<ul style="list-style-type: none"> Opened circuits with air contact. 	Process temperature < +250 °C. High viscosity.	310	ISO 6743-12 L-QA
SERIOLA QA 46	Inhibited mineral	<ul style="list-style-type: none"> Opened circuits with air contact. 	Process temperature < +250 °C.	46	ISO 6743-12 L-QA
SERIOLA 1510	Mineral	<ul style="list-style-type: none"> Closed circuits without air contact. 	Process temperature < +310 °C. (+330 °C in the film).	31	ISO 6743-12 L-QC
SERIOLA ETA	Mineral	<ul style="list-style-type: none"> Closed circuits without air contact. 	Process temperature < +310 °C. (+350 °C in the film).	31 100	ISO 6743-12 L-QC
NEVASTANE HTF	White mineral	<ul style="list-style-type: none"> Closed circuits without air contact. Numerous manufacturing processes in agrifood industry: water baths, autoclaves, reactors, ovens, presses and moulds. 	Process temperature < +310 °C. (+330 °C in the film).	32	NSF H1 ISO 6743-12 L-QC • ISO 21469 Halal, Kosher
SERIOLA DTH	Synthetic detergent	<ul style="list-style-type: none"> Hot cleaning of heat transfer circuits. <p>Miscible with mineral-base heat transfer fluids.</p>	Process temperature ~+270 °C. Very high thermal stability.	25	
JARYTHERM DBT	Synthetic	<ul style="list-style-type: none"> Closed circuits without air contact. Main applications in the chemical and plastics processing industries. 	Process temperature from 0 °C to +350 °C (+370 °C in the film).	19	ISO 6743-12 L-QD
JARYTHERM BT 06	Synthetic	<ul style="list-style-type: none"> Closed circuits without air contact. Primarily for installations combining heating and cooling cycles. 	Process temperature from -30 °C to +280 °C. Temperature in the pressurized circuits < +350 °C.	4	ISO 6743-12 L-QE

WHITE OILS AND VASELINES


FINAVESTAN white oils are exceptionally highly purified, due to the additional refining processes which include a high technology and high pressure hydrogenation process. Oils of medicinal quality meet the requirements of the pharmaceutical, cosmetics and agrifood industries in accordance with the national legislation in force.

LYRAN products are technically white oils of high purity. They are used in numerous non-food applications, as a lubricant, as a plasticizer or as a component.

PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY*	SPECIFICATIONS
 FINAVESTAN A 50 B	Medicinal white oil	<ul style="list-style-type: none"> Designed for the following industries: <ul style="list-style-type: none"> - pharmaceutical: excipient, - cosmetics: raw material, - plastics: plasticizer for PS and other polymers, for all packaging intended for food contact, - food: in accordance with the legislation in force. 	Very high purity. Odourless, flavourless, colourless. Does not contain sulphur or aromatic hydrocarbon.	7.5	The use of these oils depends on the national legislation in force. European Pharmacopoeia, liquid paraffin (most recent edition) US Pharmacopoeia, Mineral Oil (most recent edition) USA FDA: 21 CFR 172.878 et 21 CFR 178.3620 (a), white mineral oil NSF 3H
FINAVESTAN A 80 B				15	
FINAVESTAN A 100 B				23	
FINAVESTAN A 180 B				29	
FINAVESTAN A 210 B				40	
FINAVESTAN A 360 B				70	
FINAVESTAN A 520 B				100	
LYRAN C 80 B	Technical white oil	<ul style="list-style-type: none"> Process oil or raw material for: <ul style="list-style-type: none"> - lubrication of small devices, - manufacturing of plastics, rubbers and pesticides, - component for ink and textile oils. 	Very high purity. Odourless, flavourless, colourless. Does not contain sulphur or aromatic hydrocarbon.	15	FDA, 21 CFR 178-3620 (b)
EMETAN M	Medicinal vaseline	<ul style="list-style-type: none"> Designed chiefly for the cosmetics and pharmaceutical industries as a lubricant or raw material. 	Very high purity. Odourless, flavourless.		The use of these vaselines depends on the national legislation in force. EMETAN M only: European, French, German and US Pharmacopoeia
EMETAN T	Vaseline				

VEGETABLE OILS FOR THE AGRIFOOD INDUSTRY

FINATUROL oils are specially designed for pastries and industrial baking. Their composition is 100% vegetable, with no GMO or compound of animal origin. Products available only in Europe.

PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY*	SPECIFICATIONS
 FINATUROL K2	100% vegetable Contains no compound of animal origin GMO-free	<ul style="list-style-type: none"> For pastries and industrial baking: for dough dividers and bread slicers. 	Economic vegetable oil. No taste and odour tainting of the finished product.	35	NSF 3H Technological food auxiliary approved by the DGCCRF (France)
FINATUROL D			High-performance product. Reduced oil consumption. Reduction in the formation of deposits.	35	
FINATUROL HT		<ul style="list-style-type: none"> For pastries and industrial baking: high temperature food mould oil. 	Less consumption of product. Neutral odour and taste does not taint the finished product. Easy application.	100	

PROCESS OILS

PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY*	SPECIFICATIONS
TORILIS	Pure mineral	<ul style="list-style-type: none"> Process oil in various industries: rubber, plastics, textile (softening), treatment of leather, printing inks. Anti-caking agent and dust suppressant or anti-dust agent. 	High natural viscosity index. Perfectly suitable for mixtures.	32 to 500	-
TORILIS HC	Hydrocracked mineral oil		Very high viscosity index. Enhanced purity in respect to standard mineral oils: lower sulphur and aromatic content. Highly refined oil : better oxydation resistance and higher thermal stability.	14	-

MACROEMULSION FOR HARD MATERIAL SAWING

PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY*	SPECIFICATIONS
GRANITCUT 5000	Mineral concentrate soluble in water	<ul style="list-style-type: none"> Designed for sawing of ceramics, granite with diamond-charged disk, wire or cable and for core sampling of granite blocks. 	Rate of use: 2%.	15	ISO-L-MAB

* Typical kinematic viscosity at 40 °C in mm²/s

CIRCULATION OILS

CIRKAN, CORTIS and **MISOLA** are circulation oils designed for the centralized lubrication of various systems on industrial machines : bearings, gears, etc.
TOTAL offers a wide range, from pure mineral oil for lubrication of weakly loaded systems operating at a moderate temperature, to highly sophisticated products adapted to the severest operating conditions.


MISOLA oils have been specifically developed for the pulp and paper industry.
The classifications shown for these fluids are those of the ISO 6743-4 and ISO 6743-6 standards in accordance with the performance level and the viscosity grade.

PRODUCT	APPLICATIONS	SPECIFIC ADVANTAGES	ISO VG	SPECIFICATIONS
CIRKAN C	<ul style="list-style-type: none"> Total loss or sump lubrication for movements, joints, bearings, chains. 	Severely refined paraffinic mineral oil. High natural viscosity index.	32 to 320	ISO 6743-4 HH • ISO 6743/1 AN
CIRKAN RO	<ul style="list-style-type: none"> Apparatus and hydraulic circuits subjected to temperature constraints. 	Anticorrosion protection of equipment. Oxidation resistance.	32 to 460	ISO 6743-4 HL • ISO 6743-6 CKB • DIN 51517-2 CL • DIN 51524-1HL • AGMA 9005-E2 RO
CIRKAN ZS	<ul style="list-style-type: none"> Apparatus and hydraulic circuits operating under severe temperature and load conditions. 	Very good anti-wear and anticorrosion properties. Reinforced protection of highly loaded equipment. Oxidation resistance.	220 320	ISO 6743-6 CKB • ISO 12925-1 CKB
CORTIS MS	<ul style="list-style-type: none"> Gears, movements and various mechanical systems requiring anti-wear properties. For Morgoil-type hydrodynamic bearings, BGV bearings and Danieli ESS. 	Very good anti-wear and anticorrosion properties. Reinforced protection of highly loaded equipment. Formation of deposits prevented due to ashless additives. Excellent demulsification properties.	100 to 680	ISO 6743-4 HM • ISO 12925-1 CKC Danieli® Standard • Morgoil® Lubricant • Morgoil® Advanced Lubricant

CIRCULATION OILS FOR PAPERMAKING MACHINES

PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	ISO VG	SPECIFICATIONS
MISOLA AFH	Ashless mineral	<ul style="list-style-type: none"> Bearings and gears operating in a warm, moist environment. 	Excellent thermal stability and oxidation resistance. Reinforced anti-wear protection. Excellent anticorrosion protection. Ashless additives limiting the formation of deposits.	150 220	ISO 12925-1 CKD Voith VN 108 • FAG FE8 PM
MISOLA ASC	Ashless mineral	<ul style="list-style-type: none"> Equipment operating under high temperature and load conditions. Bearings and gears operating in a warm, moist environment. Wet- and dry-end sections of papermaking machines. Advised when loaded gears form part of the lubrication circuit. 	Excellent load capacity. Long life oil thanks to very good thermal stability and oxidation resistance. Very good anticorrosion protection even in the presence of acid process water. Ashless additivation limiting the formation of deposits.	100 to 320	ISO 12925-1 CKD Voith • Metso • SKF • FAG
MISOLA MAP	Ashless semi-synthetic	<ul style="list-style-type: none"> Plain or rolling bearings and medium-loaded gears subjected to considerable temperature constraints. Drying cylinder bearings for papermaking machines. Hydraulic circuits in variable crown cylinders. 	Able to endure temperatures up to +130 °C. Excellent anticorrosion protection. Ashless additives limiting the formation of deposits. Extra long life oil.	150 to 460	ISO 6743-4 HL • ISO 12925-1 CKB SKF Rollen Test
MISOLA MAP SH	Ashless synthetic PAO	<ul style="list-style-type: none"> Plain or rolling bearings and medium-loaded gears subjected to considerable temperature constraints. Recommended for drying cylinder bearings for papermaking machines. 	Able to endure considerable temperature constraints. Excellent anti-wear and anticorrosion protection. Ashless additives limiting the formation of deposits. Extra long life oil.	150 to 460	ISO 12925-1 CKS Voith VN108 • Metso • SKF Rollen Test • FAG FE8 PM

HIGH TEMPERATURE CHAIN OILS

PRODUCT	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY*	SPECIFICATIONS
CORTIS SHT 200	<ul style="list-style-type: none"> • Continuous lubrication systems. • Movements, roller chains, rollers of the roller bearings, cams operating in ovens or stoves. • Glass manufacturing machines. • Conveyor chains for continuous hot-pressing machines. 	Synthetic bases limiting oxidation deposits at very high temperatures. Anti-wear power guaranteed at very high temperatures. Ensures continuous lubrication of devices at temperatures up to +240 °C.	200	-
CORTIS XHT	<ul style="list-style-type: none"> • Continuous lubrication system. • Movements, roller chains, rollers of the roller bearings, cams operating in ovens or stoves. • Chains and bars in continuous wood panel production lines. • Glass manufacturing machines. • Conveyor chains for continuous hot-pressing machines. 	Synthetic lubricant for continuous lubrication of devices at temperatures up to 280°C. Reduce the consumption regarding its very low volatility and oxidation resistance.	68 245 320	-
 NEVASTANE CHAIN OIL XT	<ul style="list-style-type: none"> • Continuous lubricating oil for conveyor chains operating at very high temperature in the food industry. • For very high load, Lubrication of industrial mechanism working at very high temperatures where incidental contact with the food product is possible according to the HACCP assessment. 	Synthetic lubricant for continuous lubrication of devices at temperatures up to 240°C. Excellent resistance to bacterial development and moisture ingress.	220	NSF H1

OILS FOR STEAM CYLINDER ENGINES

PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	ISO VG	SPECIFICATIONS
CYL	Non-compounded mineral	<ul style="list-style-type: none"> • Steam cylinder engines. 	Severely refined base oils. High viscosity index.	460 680 1000	ISO 6743-99 Z
CYL C	Compounded mineral			460 680	ISO 6743-99 Z

SPECIAL PRODUCTS FOR THE AGRIFOOD INDUSTRY

The **NEVASTANE** range is specially designed for the agrifood industry and its related activities such as the manufacture of packaging. It is also used in the pharmaceutical and the cosmetics industry.

All **NEVASTANE** products are NSF H1 registered. Their use is essential when a high level of hygiene is required, in compliance with HACCP method. As high-performance products, they provide equipment protection and extended service life while securing the production chain.

PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	SPECIFICATIONS
NEVASTANE LUBE AEROSOL	Multi purpose adhesive oil	<ul style="list-style-type: none"> • Small machines requiring almost daily lubrication. • Conveyors and rails. • Packaging machines. 	Range of use : -20°C to +150°C. Exceptional adhesion to metal surfaces. Resistant to water, steam and weak acid and alkaline atmospheres.	NSF H1
NEVASTANE GREASE AEROSOL	Water resistant grease	<ul style="list-style-type: none"> • Bearings, hinges, springs, chains, rails and tools. 	Range of use : -20°C to +150°C. Excellent resistance to water and steam. Exceptional adhesion to metal surfaces. Resistant to detergents.	NSF H1
NEVASTANE SILICONE SAFEGARD	Aerosol composed of a high-viscosity silicone oil	<ul style="list-style-type: none"> • Gliding agent and lubricant. 	Use between -40 °C and +200 °C. Insulating, anti-rust and anti-corrosion. Odourless, colourless and non-greasy.	NSF H1 Kosher
NEVASTANE FLUSH OIL	Low-viscosity rinsing fluid	<ul style="list-style-type: none"> • For lubrication of devices and circuits. • Ideal for switching from a standard lubricant to a NSF H1 lubricant. 	Elimination of deposits and impurities. Viscosity* : 9.5.	NSF H1 Kosher, Halal ISO 21469
NEVASTANE SDO	Sugar dissolving oil	<ul style="list-style-type: none"> • Application in pure form (can be diluted). • Prevent the accumulation of sugar on machine parts. • Dissolve the sugar accumulated in the production areas. 	Reduction of maintenance costs and shutdowns. White odourless liquid. Excellent descaling power.	NSF H1 Kosher

INSULATING OILS

PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY*	SPECIFICATIONS
ISOVOLTINE II	Naphthenic mineral (uninhibited)	<ul style="list-style-type: none"> • For transformers, circuit breakers, contactors and all high-voltage equipment. 	High insulating power. Very high resistance to oxidation enabling a considerable service life. Excellent cooling properties.	10	IEC 60296:2003
ISOVOLTINE II T	Naphthenic mineral (trace inhibited)	<ul style="list-style-type: none"> • For transformers, circuit breakers, contactors and all high-voltage equipments. 	High insulating power. Contains traces of inhibitor to improve oxidation resistance. Good cooling properties.	8.2	IEC 60296 Type T • ASTM D 3487 Type I • JIS C 2320 Type I
ISOVOLTINE II X	Naphthenic mineral (inhibited)	<ul style="list-style-type: none"> • For transformers, circuit breakers, contactors and all high-voltage equipment. 	High insulating power. Contains inhibitor to ensure a better resistance to oxidation. Good cooling properties.	10	IEC 60296 : type I
ISOVOLTINE II T X	Naphthenic mineral (inhibited)	<ul style="list-style-type: none"> • For transformers, circuit breakers, contactors and all high-voltage equipment. 	High insulating power. Contains inhibitor to ensure a better resistance to oxidation. Good cooling properties.	8.4	IEC 60296 (2012): Type I • ASTM D 3487: Type II • JIS C 2320: class 1, class IA, IIA
ISOVOLTINE BIO	Synthetic esters	<ul style="list-style-type: none"> • Transformers. • Highly recommended to limit the risks of water pollution and fire. 	Biodegradable. Excellent resistance to fire. No danger for the aquatic environment.	22	IEC 61099 • IEC 61100 - K3 OECD 301B • NWG

NSF H1, suitable for incidental food contact

Biodegradable


* Typical kinematic viscosity at 40 °C in mm²/s.

ANTIFREEZE AND COOLANTS

COOLELF are ready-to-use coolants. **GLACELF** are antifreezes for dilution in demineralised water. The antifreeze and coolants protect engines against freezing-up, overheating and corrosion of the cooling circuit metals.

The performances of the products are enhanced due to organic additives.


- Long service life.
- Complete preservation of the anti-corrosion properties due to non-consumption of the additives.
- Absence of any formation of deposit liable to hinder the heat transfer capacity.

PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	ANTIFREEZE PROTECTION	SPECIFICATIONS
COOLELF SUPRA	Ready-to-use coolants	<ul style="list-style-type: none"> • Diesel industrial engines, gas engines of all sizes. 	Long life.	-26 °C	AFNOR NF R 15-601 • ASTM D 3306, D 4656, D 4985 • BS 6580 • SAE J 1034 MWM (Deutz) • GE Jenbacher • Rolls-Royce • MTU
GLACELF SUPRA	Antifreeze concentrate			-20 °C to -69 °C depending on % of dilution	
COOLELF CHP SUPRA	Ready-to-use coolants	<ul style="list-style-type: none"> • Engines of cogeneration plants. • Recommended in countries or conditions where a -7 °C antifreeze protection is sufficient. 	Long life. Higher heat transfer capacity.	-7 °C	AFNOR NF R 15-601 • ASTM D 3306, D 4985 • BS 6580, BS 5117 • SAE J 1034 MWM (Deutz) • GE Jenbacher
GLACELF CHP SUPRA	Antifreeze concentrate			-7 °C to -15 °C depending on % of dilution	
COOLELF SUPRA GF NP	Ready-to-use coolants	<ul style="list-style-type: none"> • Nuclear power industry. • Recommended in cold countries. 	Long life. Higher antifreeze protection.	-37 °C	AFNOR NF R 15-601 • ASTM D 3306, D 4656, D 4985, D 5345 • BS 6580, BS 5117 • SAE J 1034 EDF PMUC • MTU
COOLELF MPG SUPRA	Ready-to-use coolants	<ul style="list-style-type: none"> • Agrifood and pharmaceutical industries, cogeneration facilities: heat and cold transfer circuits. 	Coolant based on monopropylene glycol.	-26 °C	AFNOR NF R 15-601 • ASTM D 4656 • BS 6580
GLACELF MPG SUPRA	Antifreeze concentrate			-17 °C to -38 °C depending on % of dilution	
WT SUPRA	Aqueous concentrate of specific organic corrosion and cavitation inhibitors	<ul style="list-style-type: none"> • Diesel industrial engines and gas engines requiring no antifreeze protection. 	Long life anticorrosion and anticavitation protection. Optimal heat transfer capacity. Non-polluting components.	-	MWM (Deutz) • Wärtsilä • Rolls-Royce: Bergen
 NEVASTANE ANTIFREEZE	MPG based antifreeze	<ul style="list-style-type: none"> • Cooling circuits, including drinks, ice creams and frozen food processing 	Antifreeze protection : -15 °C to -40 °C depending on % of dilution. Specific protection of alloys and metal equipment against corrosion.		NSF HT1

SOLVENTS, DETERGENTS AND CLEANING FLUIDS

FINASOL products are degreasers for the cleaning of engines and a wide variety of component parts. Their properties make it possible to eliminate greases and separate the insoluble components without affecting the quality of the cleaned elements.

The **FINADET** detergents are designed for the cleaning of production zones, recommended for use in the agrifood industry and for the difficult cleaning of all types of soil.

PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	DENSITY**	SPECIFICATIONS
DEGREASERS					
FINASOL BAC	Rapid evaporation degreaser	<ul style="list-style-type: none"> Degreasing involving mechanical devices: machined parts, chassis, machine tool frames, bearings, pinions, filters, injection moulds. Surface preparation prior to assembly. 	Rapid evaporation. Compatible with all metals, most plastics and elastomers.	785	-
FINASOL HD	Special emulsifiable hydrocarbon degreaser	<ul style="list-style-type: none"> Cleaning of all engines: cars, trucks, boats. 	Compatible with most plastics and elastomers.	805	-
FINASOL FPI	Synthesis hydrocarbon Benzene-free Aromatic-free	<ul style="list-style-type: none"> Degreaser and cleaner for the agrifood industries: machine parts, chassis machine tools, bearings, pinions, filters, chains. 	Odorless. Compatible with metals, glass, ceramics, composite materials, most thermoplastics and thermosets insensitive to organic solvents.	742	NSF K1
FINASOL MF	Emulsifiable degreaser	<ul style="list-style-type: none"> Multipurpose. 	Conducive to complete emulsification of oil based soils and separation of the insoluble components.	809	-
 FINASOL BIO	Pure or diluted degreasing agent 100% vegetal based VOC free	<ul style="list-style-type: none"> Cleaning of all engines, elimination of fuels and resins, removes tar, bitumen, floor cleaning. 	Odorless, biodegradable and non toxic. Not aggressive to elastomers or plastics.	855	Easily biodegradable according to OECD 301 B test Fully biodegradable according to OECD 302 C test
DETERGENTS					
FINADET MF	Overconcentrated detergent	<ul style="list-style-type: none"> Difficult cleaning: metal parts, plastics, conveyor belts, tanks, car bodies, brushing or washing machines, floors. 	Highly active on every type of soil: oils, greases, waxes, sludge, and inorganic substrates.	1089	-
FINADET FPI	Special agrifood detergent	<ul style="list-style-type: none"> Degreaser and cleaner for the agrifood industries: metal or plastic parts, vehicles designed for transportation of foodstuffs. 	Meets the requirements of the food industries.	1086	NSF A1 Menthol perfume
FINADET SW	Special washing machine detergent	<ul style="list-style-type: none"> Special cleaning of parts placed in closed washing machines. 	Automatic. Foam free.	1062	-
PRODUCT	NATURE	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY*	SPECIFICATIONS
CLEANER F & V	Detergent additive	<ul style="list-style-type: none"> Cleaning agent for any type of systems: hydraulics, gear, paper machine, heat transfer. 	High detergency and dispersancy properties. Recommended for varnish issues.	52 (F) 173 (V)	-


PETRONAPTHE, a Total brand dedicated to the textile industry, offers a complete range of auxiliary products and textile oils that help improve the output of your machines and the quality of your yarn and fabric production at every step.

PETRONAPTHE products are designed by our specialist teams in close cooperation with textile manufacturers

and equipment engineers with the aim of satisfying all textile lubricant demands in a variety of sectors: automobile, flooring, clothing, furniture, etc.

All products in the PETRONAPTHE range are produced in line with REACH regulations and are free from any SVHCs (Substances of Very High Concern) such as alkylphenol ethoxylates.

THROWING (TWISTING, COVERING, TEXTURAZING, WINDING)

PRODUCT	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY (20°C)	NATURE
LISSOLFIX APZX 1500	<ul style="list-style-type: none"> Coning oil advised for high speed yarn transformation. Suitable for medium to high count synthetic, artificial or natural yarn. Suitable for covered elastane. Adapted for dyed yarn. Used for winding, twisting, covering, and also ATY (Air Textured Yarn) or DTY (Draw Textured Yarn) processes. Not recommended for polypropylene. 	High level of anti-splashing performances (AP) and good antistatic (AS) one. Has hardly any effect on dye fastnesses. Easy to wash out.	38 – 42 cSt	Mineral
 LISSOLFIX APZX 1350	<ul style="list-style-type: none"> Coning oil specially designed for fine count multifilament yarn (Polyamide 6 & 66 or Polyester) lubrication on high speed winding processes. Suitable for covered elastane and also rayon viscose (dyed or raw white) rewinding. Used for DTY (Draw Textured Yarn) winding process. Not recommended for polypropylene. 	Improves fine count multifilament inter cohesion. Does not provoke Polyamide oxidation when exposed to light or heat treatments. High level of anti-splashing performances (AP) and good antistatic (AS) one. Easy to wash out. Ultimate biodegradability (> 60%) according to OECD 301-B.	21 – 26 cSt	Semi-synthetic
LISSOLFIX APZ 222	<ul style="list-style-type: none"> Coning Oil advised for high speed synthetic yarn transformation (Polyamide, Polyester) and for artificial or natural. Used for winding, twisting, covering, and also ATY (Air Textured Yarn) or DTY (Draw Textured Yarn) processes. Strongly adapted for Polypropylene yarn (PP). 	High level of anti-splashing performances (AP) and good antistatic (AS) one. Ensures a very low gliding coefficient. Easy to wash out. Ultimate biodegradability (> 60%) according to OECD 301-B.	28 – 33 cSt	Synthetic
LISSOLFIX APZ 2270	<ul style="list-style-type: none"> Coning oil for middle to high count high speed synthetic, artificial or natural yarn transformation. Suitable for covered elastane. Used for DTY (Draw Textured Yarn) winding process. 	Has hardly any effect on dye fastnesses. High level of anti-splashing performances (AP). Easy to wash out.	28 – 31 cSt	Mineral
LISSOLFIX APZ 2030	<ul style="list-style-type: none"> Coning oil for high speed raw white polyester transformation. Also relevant for polyamide. Used for DTY (Draw Textured Yarn) winding process. 	Anti-projection (AP) et antistatic (AS). Good washing performances.	26.5 – 29.5 cSt	Mineral
LISSOLFIX APZ 2090	<ul style="list-style-type: none"> Coning oil for high speed raw white Polyester transformation. Use for DTY (Draw Textured Yarn) winding process. 	Anti-projection (AP) et antistatic (AS). Washable.	28 – 31 cSt	Mineral


KNITTING AND TAILORING

PRODUCT	APPLICATIONS	SPECIFIC ADVANTAGES	ISO VG	NATURE
TIXO SLIDE	<ul style="list-style-type: none"> Knitting oil designed to lubricate needles from hosiery knitting machines. Suitable for raw white or dyed yarn knitted fabrics as polyester, polyamide, Cotton, Wool, etc. and blends. Highly adapted for medical items (tights, socks...) with huge elastane content. Recommended for unwashed items. Suitable for flat knitting or sewing machines lubrication. Advised for rings and travelers of spinning frames lubrication. 	High mechanical performances. Excellent knitting machine paint, plastic and seal compatibility. Colorless, odorless. High thermal oxidation durability.	22 32 46 62 68	Mineral
TIXO STAINLESS	<ul style="list-style-type: none"> Knitting oil designed to lubricate needles from large to small diameter knitting machine used for hosiery, clothing, upholstery and automotive. Appropriate for synthetic, artificial, natural and blends knitted fabrics, based on dyed or raw white yarn. Adapted to elastane content knitted fabrics. Specially designed for post washing before dyeing process. 	Easily removed in washing baths Emulsifiable lubricant with top mechanical performance level. Inert toward stocking machines parts as paint, plastics and seal. Colorless, Odorless. High thermal oxidation durability.	22 32 46	Mineral

NON WOVEN & STAPLE FIBER PROCESSES (NEEDLING, CARDING, COMBING)

PRODUCT	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY (20°C)	NATURE
ELECTROFIX NT 4820	<ul style="list-style-type: none"> Antistatic lubricant designed for carding and needling of any kind of material. Can be used alone or as an additive to lubricating preparations. 	Good antistatic and lubrication performances.	-	Synthetic
ELECTROFIX PPA 982	<ul style="list-style-type: none"> Antistatic lubricant suitable for polypropylene fibers needling used for wall and floor-coverings production (starting from 300g/m²). Adapted to polyester fiber (PES) needling. 	Good antistatic and lubrication performances.	-	Synthetic
ELECTROFIX NT 75	<ul style="list-style-type: none"> Antistatic lubricant for web lapping and needling of polyester, polyamide, polypropylene and blends with wool or jute. Suitable for natural and synthetic fiber tearing. 	Non greasy water soluble lubricant without mineral oil.	140 – 180 cSt	Synthetic
TEXINOL CP 209	<ul style="list-style-type: none"> Carding and combing lubricant for crossbred wool, worsted spinning wools and cashmere fiber. Suitable for wool and synthetic blended fiber semi-worsted spinning. 	Non greasy water soluble lubricant without mineral oil.	140 – 180 cSt	Synthetic
TEXINOL FC 3093	<ul style="list-style-type: none"> Carding lubricant for wool and with acrylic, polyamide, polyester, viscose or cotton blends. Can be as well used for textile matter animal and vegetable origin tearing used pure or blended with articles based on acrylic, polyamide, polyester or artificial fibers. 	Easy to dilute. To be spray on fibers.	54 - 62 cSt	Mineral
TEXINOL FPC 3153	<ul style="list-style-type: none"> Carding spinning lubricant for wool, cashmere, polyester, acrylic and their blends dedicated to knitting and weaving end uses. 	Specially designed to reduce yarn/steel friction coefficient without changing the good inter-fiber cohesion.	-	Semi-synthetic
ELECTROFIX FP 37	<ul style="list-style-type: none"> Antistatic additive for worsted and woolen spinning. Adapted to non woven. Can be used alone or as an additive. 	High antistatic performances. Water soluble.	-	Semi-synthetic

WEAVING, WARPING, BEAMING

PRODUCT	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY (20°C)	NATURE
 PARATEX 404	<ul style="list-style-type: none"> Warping lubricant for spun yarns (wool, cotton, flax and blends) but also for flat or textured (DTY, ATY) continuous filaments (dyed or raw white). Adapted to yarns containing elastane. 	Water soluble product. Gives a high inter filament cohesion level. Decreases spun yarn pilosity. Strongly improves gliding coefficient. Reduces static charges. Really easy to wash out. Cold application process. Ultimate biodegradability (> 60%) according to OECD 301-B.	85 - 115	Synthetic
PARATEX ENC 51 Z	<ul style="list-style-type: none"> Over oiling product for warped yarns sized with synthetic sizing agents (vinyllic, acrylic, soluble polyester). 	Chemically inert towards most sizing agents.	36 - 41	Mineral
PARATEX 5300 APZX	<ul style="list-style-type: none"> Warping lubricant for spun yarns (synthetic, cotton, wool, viscose, Kermel...) raw white or dyed and their blends. Suitable for elastane. 	Improves gliding coefficient. Good antistatic performances.	37 - 42	Mineral

DYEING, FINISHING & WASHING

PRODUCT	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY (20°C)	NATURE
DETERFIX TB 660 Z	<ul style="list-style-type: none"> Rinsing bath (or after dyeing) lubricant for continuous and discontinuous yarns, based on polyester, acrylic, wool and their blends. Specially formulated to be applied in autoclave on dyed yarn bobbins. Helps to use directly bobbins in knitting or weaving processes. Application process from 25°C to 50°C, pH 4 – 4.5. 	<p>Suppresses after dyeing rewinding process. Enables a high exhaustion. Reduces oil consumption and waste station rejection. Reduces and regularizes unwinding tensions. Gives a good antistatic protection. Low temperature wash out. Cancels softener.</p>	-	Synthetic
DETERFIX TB 6800 Z	<ul style="list-style-type: none"> Rinsing bath (or after dyeing) lubricant for continuous and discontinuous polyamide dyed yarns. Specially formulated to be applied in autoclave on dyed yarn bobbins. Helps to use directly bobbins in knitting or weaving processes. Application process from 25°C to 50°C, pH 4 – 4.5. 	<p>Suppresses after dyeing rewinding process. Enables a high exhaustion. Reduces oil consumption and waste station rejection. Reduces and regularizes unwinding tensions. Gives a good antistatic protection. Low temperature wash out. Cancels softener</p>	-	Mineral
DETERFIX TB 6153	<ul style="list-style-type: none"> Rinsing bath (or after dyeing) lubricant for continuous polyester dyed yarns bobbins, designed to be applied after dyeing process. Suitable for polyester staple fibers or tops and their blends. Helps to use directly bobbins in knitting or weaving processes. Application process from 40°C to 70°C, pH 6.5 – 7.5. 	<p>Suppresses after dyeing rewinding process. Reduces oil consumption and waste station rejection. Reduces and regularizes unwinding tensions. Gives a good antistatic protection. Reduces oligomers deposit. Cancels softener.</p>	-	Semi-synthetic
DETERFIX HE 656	<ul style="list-style-type: none"> Detergent designed for woven or knitted fabrics deoiling. Strongly adapted to elastane deoiling with high textile lubricants (mineral oils or fatty acid esters) rate. Suitable for continuous or discontinuous washing processes (JET, OVERFLOW, etc). 	<p>~100% active raw material. Approved by INVISTA™ laboratory for its good compatibility level with Lycra® fiber and ability to spread silicones in washing bath. Adapted to automotive requirements.</p>	< 200 cSt	Synthetic
DETERFIX CR 677	<ul style="list-style-type: none"> Detergent designed to wash out oils (spinning, coning and knitting origin) from hosiery items. Designed to clean elastomer content knitted fabrics, as hosiery, bodies, ribbon, etc . 	<p>~100% active raw material. Approved by INVISTA™ laboratory for its good compatibility level with Lycra® fiber and ability to spread silicones in washing bath.</p>	< 200 cSt	Synthetic

TOTAL offers a comprehensive range of metalworking fluids that will enable you to increase your competitiveness by combining machining quality and reduced production costs. Our Metal Working Fluid formulations are based on research conducted on actual machine tools. Feedbacks from these machine tools allow us to continuously monitor the machine and fluids performance in use. This allows us to optimise our formulations to meet the demands of each operation whilst maximising fluid life and minimising tool wear.

As a result, the fluids provide reduced energy consumption and lengthened tool service life and help to reduce operating costs. The Health, Safety and Environmental impact of our products are priorities for TOTAL:

- The formulation of the products complies with legislations in force and ensures greater acceptability and convenience of use for the operators.
- Our tailored training programmes offer guidance in best practice for the selection, handling and maintenance of our fluids.

NEAT CUTTING OILS

VALONA oils are designed for a wide range of machining, from non-severe to very arduous operations. They guarantee a high performance level while remaining environmentally friendly due to their chlorine-free formulation.

- Very good surface finish with a high standard of dimensions and tolerances.
- Extended service life for cutting tools.
- Minimising the cost of rejected components.
- Convenient use for the operators.


VALONA HC is a complete line of neat cutting oils formulated from hydrocracked base oils. Transparent and odorless, these oils present no objectionable workplace characteristics. The advanced chemistry of Valona HC provides excellent volatility and thermal-oxidative stability which minimizes misting and oil consumption that extends oil life as compared to competitive products.

The products' performance levels are indicated by a figure ascending from 1000 to 9000. The ascending numbers following the products' name reflect the machining capacity of the fluid, from non severe to very hard operations.

PRODUCT	METALS	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY*	SPECIFICATIONS	
CUTTING OILS FOR SEVERE MACHINING						
VALONA MS 5009 HC	Ferrous and non-ferrous	• Precision turning and drilling of copper or aluminium alloys, low-carbon and medium-high-carbon steels.	Excellent cooling power.	9	ISO-L-MHE	
VALONA MS 5020 HC		• Precision turning and routine machining of copper or aluminium alloys, and steels including hard or stainless.	Polyvalent product.	21		
CUTTING OILS FOR VERY SEVERE MACHINING						
VALONA MS 7009 HC	Ferrous and non-ferrous	• Machining of steels ranging as far as extra-high-carbon, special and refractory steels.	High efficiency in a wide application range, including biomedical and aeronautical.	10	ISO-L-MHB	
VALONA MS 7023 HC			23			
VALONA MS 7116 HC			Recommended for the machining of titanium.	16		
VALONA ST 9013 HC	Ferrous	• Deep drilling, steel tapping, boring, reaming of alloyed and stainless steels, hobbing and shaving, high-speed (VG 13) and slow-speed (VG 37) broaching.	Premium oil for the most demanding applications.	13	ISO-L-MHF	
VALONA ST 9122 HC				20		
VALONA ST 9037 HC				42		
VALONA BR 9015 HC	Ferrous and aluminium	• High-speed broaching of highly alloyed steels and all difficult operations.	Exceptional finish for broaching.	15	ISO-L-MHF	
GRINDING AND LAPPING OILS						
VALONA GR 3000 HC series	Ferrous and non-ferrous	• Honing and superfinishing of high-carbon steels.	Economic product. Low odour. Translucent. Low volatility.	3 5 8	ISO-L-MHA	
VALONA GR 7000 HC series		• Grinding.	Optimised for demanding grinding operations.	7 12		ISO-L-MHF
VALONA GR 9000 HC series		• Flute grinding.		11 18		

* Typical kinematic viscosity at 40 °C in mm²/s

NEAT CUTTING OILS

PRODUCT	METALS	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY*	SPECIFICATIONS
MICROLUBRICATION OILS					
VALONA MQL 3028	Ferrous and non-ferrous	<ul style="list-style-type: none"> • Microspray. • Particularly suited to milling, tapping, drilling, reaming and sawing. 	Volatile product leaving no residue. Reduced fluid consumption. Cleaner machines and workshops. Elimination of the costs of rejects. Improved recovery of cuttings.	28	ISO-L-MHB
 VALONA MQL 3046	Ferrous and non-ferrous	<ul style="list-style-type: none"> • Microspray. • Particularly suited to milling, tapping, drilling, reaming and sawing. 	Vegetable base oil. Reduced fluid consumption. Cleaner machines and workshops. Elimination of the costs of rejects. Improved recovery of cuttings	46	ISO-L-MHB
VALONA MQL 5035	Ferrous and non-ferrous	<ul style="list-style-type: none"> • Likewise VALONA MQL 3028 and 3046 as well as: severe and very severe machining of high-carbon and extra high-carbon steels, stainless steels, titanium and tantalum alloys. 	Reduced fluid consumption. Cleaner machines and workshops. Elimination of the costs of rejects. Improved recovery of cuttings.	35	ISO-L-MHE
CUTTING OILS FOR GLASS					
VALONA GLASSCUT	Glass	<ul style="list-style-type: none"> • Glass machining. 	Excellent surface finishing. Fluid product. Low consumption. Prolongs tool lifetime.	2.4	ISO-L-MHB

MULTIPURPOSE CUTTING AND LUBRICATION OILS

PRODUCT	METALS	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY*	SPECIFICATIONS
VALONA MS 3040 HC	Ferrous and non-ferrous	<ul style="list-style-type: none"> • Lubrication of cutting operations and machine tools. 	Recommended for free-cutting steels and low-carbon steels.	40	ISO-L-MHE
VALONA MS 5032 HC			Recommended for stainless steels.	32	
VALONA MS 7046 HC			Machining of all metals, including refractory steels and titanium. Recommended for tapping operations.	46	

SOLUBLE CUTTING FLUIDS

TOTAL offers a wide range of soluble fluids: macro-emulsions with **LACTUCA**, micro-emulsions with **SPIRIT** and synthetic fluids with **VULSOL**.

In order to minimise health and safety concerns for operators, all the fluids comply with international regulations such as the Dangerous Products Directive (DPD) 1999/45/EC or Biocidal Products Directive BPD 98/8/EC.

In particular, they are free of formaldehyde, chlorine (except one), nitrite, diethanolamine, and other substances that are regarded as being of concern to individual health, safety or the environment.

In addition, Total has taken a lead and has been at the forefront in developing products that are formulated without Boron, in anticipation of the use of boric acid and its salts being added to the list of Substances of Very High Concern (SVHC) under REACH and possible subsequent restrictions that may be imposed as a result of this.

The use of clean water of good biological and physicochemical quality is recommended for the implementation and maintenance of soluble fluids.

Their formulation guarantees machining performance for any type of metals and severity of operations:

- Reduction in the cutting efforts provides longer tool service life and superior surface finish of the parts,
- Protection against corrosion of machined parts and equipment.
- Resistance to the development of bacteria and yeast and fungi.
- Non-foaming product with no particular odour for convenient use.
- Stability in service ensuring long fluid life.

PRODUCT	METALS	APPLICATIONS	SPECIFIC ADVANTAGES	HSE	SPECIFICATIONS
MACRO-EMULSIONS					
LACTUCA LT 3000	Non-ferrous and low-carbon steels	• Classical machining, brass bar turning. Works well on fine carbon steels.	Economic formula. Does not stain cupric metals.	Boron free	ISO-L-MAA
LACTUCA MSF 5200	Ferrous and non-ferrous	• Classical machining of all types of metals, multi-purpose. Very good for sawing.	Multipurpose, good resistance through time.	Boron free	ISO-L-MAA
LACTUCA WBA 5400	Ferrous and non-ferrous	• Classical and difficult machining, also effective for machining of aluminium.	Adapted to difficult applications. Specifically dedicated to situations with severe HSE constraints.	Free of boron, amine and bactericide	ISO-L MAD
LACTUCA DDC 5000	Ferrous and non-ferrous	• Very arduous machining, due to extreme pressure additives based on chlorinated paraffins.	Excellent cooling and wetting properties, very powerful machining capabilities.	Contains chlorinated paraffins. Boron free.	ISO-L MAD
LACTUCA WBF 9400	Ferrous and non-ferrous	• Top of range product for all difficult applications, all types of metals. Very efficient for sawing, broaching, tapping, deep drilling, etc.	Very efficient product, prolongs tool life.	Free of glycol ethers	ISO-L MAD
LACTUCA MU 68	Ferrous and non-ferrous	• "Standard" macroemulsion for classical machining. Can be used as slideway neat oil (VG 68). Also adapted to hydraulics and transmission applications.	If used as slideway oil on the same machine, it prevents tramp oil contamination of the bath.	Without boron	ISO L MAB slideway oil: VG 68.
MICRO-EMULSIONS - SEMI-SYNTHETICS					
SPIRIT WBF 3400	Ferrous and non-ferrous, very efficient on cast iron and light steels	• Classical machining and grinding of soft metals.	Economic formula. Machine cleanliness through detergent action.	Free of boron and glycol ethers	ISO L MAE
SPIRIT WBF 5400	Ferrous and non-ferrous. Ideal for steels and more generally all metals Adapted to aluminium	• Classical machining and grinding of all types of metals. The ideal multipurpose product.	Multi-metal, multipurpose: one product for all your machines. Extremely efficient biocides.	Boron free	ISO L MAE
SPIRIT WBA 5600	Ferrous and non-ferrous Ideal for yellow metals and more generally all metals	• Classical machining and grinding of all types of metals. The ideal multipurpose product, specifically dedicated for yellow metals, with enhanced HSE properties.	Multi-metal, multipurpose: one product for all your machines. Extremely efficient on yellow metals and dedicated to situations where HSE constraint is high.	Boron free, amines free, bactericide free	ISO L MAE
SPIRIT NATURA 5000	Ferrous and non-ferrous	• Classical and difficult machining, also for aeronautical applications.	Formulated only from plant-based resources for sustainable development. Long-term stability.	No mineral (petroleum based) oil, Boron free.	ISO L MAH
SPIRIT ASIB 7400	Ferrous and non-ferrous, very efficient on aluminium	• Difficult machining. Very efficient product for aluminium alloys.	Multipurpose formula, high performance, very efficient on aluminium.	-	ISO L MAF
SPIRIT WBF 7200	Ferrous and non-ferrous, titanium, aluminium	• Top of range product for all difficult applications, all types of metal. Very efficient.	Highly technical product for carrying out difficult operations and reducing cutting efforts.	Boron free	ISO L MAF

* Typical kinematic viscosity at 40 °C in mm²/s

■■■ SOLUBLE CUTTING FLUIDS

PRODUCT	METALS	APPLICATIONS	SPECIFIC ADVANTAGES	HSE	SPECIFICATIONS
SOLUBLE SYNTHETIC FLUIDS					
VULSOL MSF 5200	Ferrous	• Grinding steels. Example: roller cylinders.	Good wetting, cooling and detergent power for excellent surface condition of machined parts.	Boron free	ISO L MAG
VULSOL MSF 7200	Ferrous and non-ferrous	• Difficult machining and grinding.	Natural resistance to the development of bacteria. A single product for grinding and machining. "Transparent" product for easier machining conditions.	Boron free	ISO L MAH
VULSOL WBF 7219	Ferrous and non-ferrous, can be used on titanium	• Difficult and very difficult machining and grinding.	Long fluid life, very efficient for severe HSE constraints. A single product for grinding and machining. "Transparent" product for easier machining conditions.	Boron free, no isothiazolinones	ISO L MAH
VULSOL GLASSCUT	Optical glass and plastics	• Machining and grinding optical glass and some plastics.	Transparent product for easier working conditions, very good surface finish of parts.	Boron free	ISO L MAH

SOLUBLE CUTTING FLUIDS - REDOPING ADDITIVES IN SERVICE

The SERADE range is composed of additives for redoping in service. Used at the right time, based on the recommendations of your technical advisor, these additives allow you to extend the life of your soluble cutting fluid baths in service.

PRODUCT	METALS	APPLICATIONS	SPECIFIC ADVANTAGES
SERADE AF EMULSION	Ferrous and non-ferrous	• Antifoam: efficiently avoids foam due to application. Only recommended for LACTUCA, SPIRIT.	Reduce foam caused by application (high spraying pressure, continuous flow of fluid in the machine, etc.).
SERADE AF SYNTHETIC	Ferrous and non-ferrous	• Antifoam: efficiently avoids foam due to application. Only recommended for VULSOL.	
SERADE WQ PLUS	Ferrous and non-ferrous	• Water quality: efficiently avoids foam due to over-soft water. Caution, the lifetime of this additive is limited.	Increases water hardness.
SERADE WQ MINUS	Ferrous and non-ferrous	• Water quality: avoids the formation of white deposits due to over hard water.	Decreases water hardness.
SERADE WQ BUFFER	Ferrous and non-ferrous	• Water quality: avoids pH decrease.	Increases pH, thus improving the anticorrosion and biocide properties of the product.
SERADE AC FERROUS	Ferrous only	• Anticorrosion: avoids the corrosion of ferrous parts.	Increases the anticorrosion property of the fluid for ferrous metals.
SERADE AC NON FERROUS	Non-ferrous only	• Anticorrosion: avoids the corrosion of non ferrous metal parts.	Increases the anticorrosion property of the fluid for non-ferrous metals.
SERADE AW EMULSION	Ferrous and non-ferrous	• Anti-wear: avoids wear by friction of mechanical parts. Only recommended for LACTUCA, SPIRIT.	Anti-wear additive used to extend the life of your tools and obtain better surface finish of machined parts.
SERADE AW SYNTHETIC	Ferrous and non-ferrous	• Anti-wear: avoids wear by friction of mechanical parts. Only recommended for VULSOL.	
SERADE STAB EMULSION	Ferrous and non-ferrous	• Emulsion stabiliser: only recommended for LACTUCA, SPIRIT, in case of severe contamination by grease and oils (often caused by tramp oils).	Stabilise emulsion by optimising the dispersion of water in the oil.
SERADE STAB SYNTHETIC	Ferrous and non-ferrous	• Genuine stabilising solution: only recommended for VULSOL, in case of severe contamination by grease and oils (often caused by tramp oils).	Improves the separation of oil and water (breaks emulsions that could be formed).
CONTRAM CB 3	Ferrous and non-ferrous	• Biological protection: used to clean (detergent + biocide) contaminated machine systems prior to replenishing.	Additive for use prior to draining the system for use when the machine has suffered from bacterial ingress.
EBOTEC BT 80	Ferrous and non-ferrous	• Biological protection: used to redope the bactericide properties of a fluid in service.	Treatment additives to extend the life of a fluid in service where the fluids resistance to bacteria has been reduced.
GROTAN OX	Ferrous and non-ferrous	• Biological protection: used to redope the bactericide properties of a fluid in service.	
TROYSHIELD PA 10	Ferrous and non-ferrous	• Biological protection: used to redope the fungicide properties of a fluid in service.	

METAL FORMING OILS

The **MARTOL** range is designed to lubricate cold forming operations on ferrous and non-ferrous metals: die stamping, forming, cutting, drawing, wire drawing, as a function of the products used. In order to protect the health of users and protect the environment, we propose the following chlorine free formulas. The characteristics of the products regarding hygiene, health and the environment (HSE) are specified in the tables.



MARTOL oils guarantee a very high level of lubrication and gains in productivity:

- Very good surface finish of stamped parts.
- Reduction of maintenance shutdowns.
- Good anticorrosion properties.
- Easy to remove.

PRODUCT	METALS	APPLICATIONS	SPECIFIC ADVANTAGES	HSE	VISCOSITY*	SPECIFICATIONS
NEAT METAL FORMING OILS - FOR AVERAGE AND DIFFICULT OPERATIONS, CHLORINE FREE						
MARTOL AL	Non-ferrous	• Deep drawing, wire drawing and tube drawing.	Optimised for aluminium. Up to -30% of degreasing time.	Chlorine free	60 150	ISO-L-MHF
MARTOL 20 CF	Ferrous, non-ferrous and aluminium alloys	• Cutting, light pressing. Tube sinking, flow turning for thickness < 2 mm.	Excellent lubricity properties.	Chlorine free	20	
MARTOL 230 CF		• Cutting and cold stamping for thickness < 2 mm. Adapted to galvanised steel and aluminium.	Very good extreme-pressure properties in deformation.	Chlorine free	230	
NEAT METAL FORMING OILS - FOR THE MOST DIFFICULT OPERATIONS, CHLORINE FREE						
MARTOL EP CF	All ferrous and aluminium	• For all stringent forming operations: deep drawing, bar drawing, cold heading...	Very good extreme pressure properties for the most difficult operations. Large range of viscosities to cover all kinds of forming geometries and all the metal thicknesses.	Chlorine free	5 65 100 235 405	ISO-L-MHF
NEAT METAL FORMING OILS - FOR THE MOST DIFFICULT OPERATIONS, CHLORINATED FORMULAS						
MARTOL EP	Steel and stainless steels	• For all stringent forming operations on hard steels and stainless steels.	Long chain chlorinated paraffins non carcinogenic following the EU directive 67/548, contrary to other products available on the market.	Chlorinated	79 180	ISO-L-MHF
EVANESCENT PRODUCTS						
MARTOL EV 10 CF	Ferrous and non-ferrous	• Light cutting and die stamping operations. • For thicknesses from 0.2 to 0.5 mm.	Odourless. Excellent film coverage.	Chlorine free Sulphur free	2.2 to 20 °C	ISO-L-MHB
MARTOL EV 40 CF		• Cutting steel and aluminium strips. More severe die stamping. • For thicknesses < 1 mm.	Colourless and odourless. Formula doped for more severe die-stamping.	Chlorine free	2.05 to 20 °C	ISO-L-MHC
MARTOL EV 45		• More severe cutting, die-stamping. • Suitable for stainless steels. • For thicknesses < 1 mm.	Low residue.	Chlorinated	2.8 to 20 °C	ISO-L-MHF
MARTOL LVG 15 CF	Non-ferrous	• Fine die-stamping-cutting. • For thicknesses < 0.3 mm.	Does not stain aluminium. Elimination of residue by thermal degreasing. Excellent spreading capacity. Odorless.	Chlorine free Sulphur free No aromatic compound	2.1 to 20 °C	ISO-L-MHB
MARTOL LVG 25 CF	Ferrous and non-ferrous	• Mild and medium-severe die-stamping operations. • For thicknesses < 2 mm.	Does not stain aluminium. Elimination of residue by thermal degreasing. Excellent spreading capacity. Odorless.	Chlorine free	2.3 to 20 °C	
EVANESCENT PRODUCTS WITHOUT VOC						
MARTOL EV 10 AQ	Aluminium, steel and stainless steel	• For easy forming operations on low thickness sheets.	VOC free product with high flash point, for better air quality and improved safety in the workshop.	VOC free. Chlorine free.	3.8 to 20 °C	
MARTOL LVG 25 AQ		• For easy forming operations for thin thicknesses, needing thermal degreasing.	VOC free product with high flash point, for better air quality and improved safety in the workshop. Especially recommended for forming parts later assembled by brazing.		4.5 to 20 °C	

* Typical kinematic viscosity at 40 °C in mm²/s, unless otherwise indicated

■■■ METAL FORMING OILS

PRODUCT	METALS	APPLICATIONS	SPECIFIC ADVANTAGES	HSE	VISCOSITY*	SPECIFICATIONS
NEAT METAL FORMING OILS - FOOD GRADE PRODUCTS						
 MARTOL FMO 3 CF	Aluminium	<ul style="list-style-type: none"> Aluminium packaging fabrication: die stamping and pre-coating aluminium strips. 	Good resistance to rancidity. Performance increases with viscosity.	Solvent + plant based raw material. Certified INS H1	3	ISO-L-MHB FDA 21 CFR 178.3570 and FDA 178.3910
 MARTOL FMO CF	Aluminium	<ul style="list-style-type: none"> Food packaging. 	Formulated with NSF 3H ester, suitable for direct food contact.		15 75 235	
NEAT METAL FORMING OILS - SYNTHETIC PRODUCTS - WITHOUT MINERAL OIL						
MARTOL SY 900 CF	Copper and non ferrous-alloys	<ul style="list-style-type: none"> Drawing copper alloy bars and profiles. 	Good wettability and little residue. Possibility of adjusting viscosity and performances by adding up to 15% water before use.	Without mineral oil	860	
MARTOL SPIROLL SE	Steel, titanium, stainless steel, inconel	<ul style="list-style-type: none"> Fabricating screws by deformation: thread rolling. 	Increase of tool life. Excellent thread shaping quality. Contains no graphite so helps keep the working environment clean.	Without mineral oil.	68 100	
SOLUBLE DEFORMATION OILS						
ETIRELF TRS 48	Hard steels and aluminium alloys	<ul style="list-style-type: none"> Die stamping. Cutting. 	Allow to adjust the level of lubrication as needed. Rationalisation of lubrication in the workshop. Good performance with hard water.	Chlorine free Formaldehyde free	52	ISO-L-MAD
MARTOL SOLUBLE 130	Ferrous and stainless steels	<ul style="list-style-type: none"> Severe stamping of steel strips. Cutting of steel plate by press. 		Chlorinated Formaldehyde free	130	ISO-L-MAD
MARTOL SOLUBLE CU	Brass and copper metals	<ul style="list-style-type: none"> Copper drawing. 		Formaldehyde free		ISO-L-MAD


ROLLING OILS

The **LUBRILAM** range is designed for cold rolling aluminium and covers a wide field of applications, from preliminary work to finishing.

LUBRILAM oils meet international specifications and are characterised by:

- Load carrying capacity
- Distillation range adapted to requirements

- High resistance to oxidation
- Solvent power of the additives
- Non-staining of aluminium
- Absence of aromatic compound as regards protection of environment and users' health

PRODUCT	METALS	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY*	SPECIFICATIONS
ROLLING BASE OILS					
LUBRILAM S 20 L	Aluminium	• Rolling base for foil doubling.	Prevents sticking of the strip. Low odour.	1.4 at 20 °C	Meets the requirements of the FDA CFR 178.3910
LUBRILAM S 23 L		• Rolling base for semi-finishing to finishing operations.	Load carrying capacity.	2.7 at 20 °C	
LUBRILAM S 31 L		• Narrow cut rolling base for semi-finishing to finishing operations.	Low evaporation losses. Energy savings during annealing operation.	2.8 at 20 °C 1.9 at 40 °C	
LUBRILAM S 40 L		• Rolling base for preliminary work operations.	Load carrying capacity, low odour. Very great thermal and UV stability.	3.5 at 20 °C 2.3 at 40 °C	
LUBRILAM S 41 L		• Rolling base enhanced with oxidation inhibitor.	Load carrying capacity, low odour. Very great thermal and UV stability. Extends the life of the rolling oil.	3.5 at 20 °C 2.3 at 40 °C	
LUBRILAM S 60 L		• Rolling base for preliminary work operations.	Load carrying capacity, low odour. Very great thermal and UV stability.	11.0 at 20 °C 6.0 at 40 °C	
LUBRILAM S 61 L		• Rolling base enhanced with oxidation inhibitor.	Load carrying capacity, low odour. Very great thermal and UV stability. Extends the life of the rolling oil.	6.3 at 40 °C	
ADDITIVE CONCENTRATES					
LUBRILAM C3	Aluminium	• Concentrate of alcohol-type performance additives to increase the lubricity of the rolling base.	Solubilisation capacity. Ease of application. INS H1	7.7 at 20 °C	Meets the requirements of the FDA CFR 178.3910 FDA 21 CFR 178.3570
LUBRILAM C6		• Concentrate of ester-type performance additives to increase the smoothness of the rolling base.	Solubilisation capacity. Ease of application. INS H1	2.3 at 40 °C	
LUBRILAM C10		• Oxidation inhibitor concentrate allowing an extension of the life of the rolling oil in service.	Solubilisation capacity. Ease of application. INS H1	2.7 at 40 °C	
SCRUBBING OILS					
LUBRILAM CLEANER	Aluminium	• Air purification oil.	Resistance to oxidation. Solvent recovery power.	30.6 at 40 °C	AIRPURE systems
 LUBRILAM CLEANER H1	Aluminium	• Air purification oil.	Resistance to oxidation. Solvent recovery power. Suitable for incidental food contact requirements.	29.8 at 40 °C	AIRPURE systems Meets the requirements of the FDA CFR 178.3570 NSF H1 registered

QUENCH OILS

DRASTA quench oils match all thermal treatment requirements and all types of installation. Formulated from base oils selected for their exceptional resistance to oxidation, they offer a cost effective means of enhancing the mechanical properties of components.

PRODUCT	TYPE OF TREATMENT	APPLICATIONS	SPECIFIC ADVANTAGES	V _{MAX} DRASTICITY	VISCOSITY*	SPECIFICATIONS
DRASTA C 1000	Cold quenching	<ul style="list-style-type: none"> Hardening of steels possessing good quenching power. Hardening of cemented or carbonitrated steels. 	Resistance to oxidation and high flash point.	53.3 °C/s at 488 °C	16	ISO-L-UHB • ISO-L-UHA
DRASTA C 1500	Cold quenching	<ul style="list-style-type: none"> Hardening of steels possessing good quenching power. Hardening of cemented or carbonitrated steels. 	Excellent resistance to oxidation and high flash point. Low volatility.	55.8 °C/s at 506 °C	20	ISO-L-UHB
DRASTA C 5000	Semi-rapid cold quenching	<ul style="list-style-type: none"> Hardening of medium-to-good quenchability steels. 	Multipurpose product. Reduced product usage due to low drag out.	76.7 °C/s at 553 °C	21,5	ISO-L-UHB
DRASTA C 7000	Rapid cold quenching	<ul style="list-style-type: none"> Hardening of low quenchability steels. 		97.5 °C/s at 602 °C	23	ISO-L-UHB
DRASTA M 7000	Semi-hot quenching	<ul style="list-style-type: none"> Hardening of steels possessing good quenching power. Hardening of cemented or carbonitrated steels. 	Stable cooling performance over time. Permits cold and hot quenching.	84 °C/s at 632 °C (bath at 100 °C)	43	ISO-L-UHD
DRASTA H 5000	Semi-accelerated hot quenching	<ul style="list-style-type: none"> Hardening of steels possessing good quenching power. Hardening of cemented or carbonitrated steels. Hardening of parts for avoidance of deformations, quenching cracks. 	Stable cooling performance over time. Reduced product usage due to low drag out.	67 °C/s at 624 °C (bath at 100 °C)	122	ISO-L-UHF
DRASTA H 7000	Semi-accelerated hot quenching			87 °C/s at 653 °C (bath at 100 °C)	134	

PROTECTION OILS

OSYRIS oils are designed to protect parts from the risks of corrosion during storage and transportation. They can be applied to all ferrous metals, from cast iron to alloyed steels.

All **OSYRIS** products can be applied by dipping spray and brush application. They can be removed with the aid of solvents and alkali cleaners.

TOTAL offers a wide range of products in accordance with the required properties of the protective film.

- Nature and thickness of the film: oil based, waxy or solvented.
- Resistance over time: inter-operations protection with water-repellent effect or a longer-lasting protection.

PRODUCT	NATURE OF THE FILM	LENGTH OF PROTECTION	SPECIFIC ADVANTAGES	SPECIFICATIONS
OSYRIS Y 1000	Oily	< 6 months	Ease of removal.	ISO-L-RC
OSYRIS Y 3000		< 6 months	Strengthened protection properties.	ISO-L-RD
OSYRIS DWX 1000	Oily after evaporation of the solvent	Only for metal surface cleaning.	Economic product for washing and dewatering of sheet metal.	ISO-L-RBB
OSYRIS DWX 3000	Waxy	6 to 8 months	Quick drying. Easily removable film.	ISO-L-REE
OSYRIS DWY 4000	Waxy	6 to 8 months	High flash point to limit the risks of fire.	ISO-L-REE
OSYRIS DWX 5000	Oily after evaporation of the solvent	8 to 12 months	Quick drying. Easily removable film.	ISO-L-REE
OSYRIS DWY 6000	Waxy	8 to 12 months	High flash point to limit the risks of fire.	ISO-L-REE
OSYRIS DWX 9000	Waxy	> 18 months	High-performance product.	ISO-L-REE
OSYRIS X 9100	Varnish	> 18 months	High-performance product.	ISO-L-RFF
OSYRIS DW LO	Oily after evaporation of the solvent	6 to 8 months	Absence of any odour of solvent.	ISO-L-REE

* Typical kinematic viscosity at 40 °C in mm²/s

PRELUBES

PRODUCT	NATURE OF THE FILM	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY*	SPECIFICATIONS
FINAROL B 5746	Oily	<ul style="list-style-type: none"> Protection and mid to severe deformation of electrozinc-coated sheet steel. 	Multipurpose product, developed for the car industry and steelmaking.	9.75	ISO-L-RC

LUBRICATION OF MACHINE TOOLS

The **DROSER A** product range is dedicated to the lubrication of machine tools. The various grades of viscosity available allow lubrication of a wide variety of mechanical parts:

- Very high speed spindles (grade 2) and high speed spindles (grades 5 to 22)
- Hydraulic circuits (grades 32 and 46)
- Both horizontal and vertical slides (grades 68 to 220)

DROSER A oils offer the following advantages:

- Multipurpose
- Very good extreme-pressure performances
- Excellent stick-slip properties
- Low friction coefficient

PRODUCT	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY*	SPECIFICATIONS
DROSER A MS	<ul style="list-style-type: none"> Multipurpose range for all machine tool parts depending on the viscosity of the lubricant: hydraulic, slideways, gears, spindle movements, feed and gear boxes. 	Wide range of applications.	2 to 220	Depending on viscosities: ISO 6743-2: FD 2-5-10-15-22 • ISO 6743-4: HG 32-46 • ISO 6743-13: GA 68-100-150-220 • DIN 51502: CGLP 46-68-100-150-220 Cincinnati-Milacron: P-65, P-62, P-47, P-50, P-53, P-45
DROSER A HXE 68	<ul style="list-style-type: none"> Way lubricant including those lined with synthetic resin, feed and gear boxes. 	Compatibility with cutting fluids, including aqueous based fluids. Very good adhesiveness.	68	ISO 6743-13: GB 68 • DIN 51524 Part 2: HLP 68 • DIN 51517 Part 3: CLP 68 • DIN 51502: CGLP 68 • AFNOR E 60203 HM 68, HG 68, G 68 • CETOP RP 91H, HM 68 Cincinnati-Milacron: P-47
DROSER A HXE 220		Compatibility with cutting fluids, even of the aqueous kind. Very good adhesiveness.	220	ISO 6743-13: GB 220 • DIN 51502: CGLP 220 • AFNOR E 60203 G 220 Cincinnati-Milacron: P-50

ELECTRO-EROSION FLUIDS

The **DIEL** range of products are particularly well adapted to the electro discharge machining process.

- Narrow distillation intervals.
- Absence of aromatic compounds.
- High flash point.
- Excellent resistance to oxidation.

DIEL electro erosion fluids comply with the European directives concerning the VOC emissions. The use of these products contributes to the continuous improvement initiatives in regards to Health, Safety and Environment.

PRODUCT	APPLICATIONS	SPECIFIC ADVANTAGES	VISCOSITY*	SPECIFICATIONS
DIEL MS 5000	<ul style="list-style-type: none"> Preliminary work and semi-finishing. 	Fluid product.	3.9	ISO-L-MHA
DIEL MS 7000	<ul style="list-style-type: none"> Semi-finishing work and finishing for complex forms and precise dimensions. 	Very fluid product, facilitating elimination of metal particles.	2.4	ISO-L-MHA

* Typical kinematic viscosity at 40 °C in mm²/s

TOTAL offers a very wide range of lubricating greases for all applications in a variety of sectors: heavy industry (cement plants, iron and steel...), agrifood, papermaking, public works, transport, agriculture and marine. TOTAL lubricating greases can be classified by « Families » depending on the nature of their soap or thickener.

The soap or thickener bestows properties to the greases, such as a multipurpose character, resistance to water, resistance to high temperature, adhesiveness... Within each « Family », the greases will be classified according to their range of applications and specific performances.

LITHIUM/CALCIUM SOAP GREASES

MULTIS and **LICAL** lithium/calcium soap greases are multipurpose greases combining good performances in regard to resistance to temperature, resistance to water, pump ability and load resistance that can be excellent

when the greases have additives. Consequently, **MULTIS** and **LICAL** constitute multi-application greases that permit rationalisation of stocks and reduced maintenance costs.


PRODUCT	APPLICATIONS	SPECIFIC ADVANTAGES	NLGI GRADE	THICKENER	OPERATING TEMPERATURE RANGE	BO VISCOSITY*	SPECIFICATIONS	
							ISO 6743-9	DIN 51502
MULTIS 2	• Multipurpose grease for general lubrication.	Compatible with most conventional soaps.	2	Li / Ca	-25 °C to +120 °C	120	L-XBCEA 2	K2K-25
MULTIS 3			3	Li / Ca	-20 °C to +120 °C	120	L-XBCEA 3	K3K-20
MULTIS EP 000	• Grease for centralized lubrication system and gears.	Extended life of the parts due to the good resistance of the lubricating film.	000	Li / Ca	-30 °C to +100 °C	150	L-XCBEB 000	GP00G-30
MULTIS EP 00			00	Li / Ca	-30 °C to +100 °C	150	L-XCBEB 00	GP00G-30
MULTIS EP 0			0	Li / Ca	-30 °C to +120 °C	150	L-XCCEB 0	MP0K-30
MULTIS EP 1			• Multipurpose grease for lubrication of all applications under load.	Enables to rationalize stocks and simplify maintenance operations.	1	Li / Ca	-30 °C to +120 °C	150
MULTIS EP 2	2	Li / Ca			-25 °C to +120 °C	150	L-XBCEB 2	KP2K-25
MULTIS EP 3	3	Li / Ca			-20 °C to +120 °C	150	L-XBCEB 3	KP3K-20
LICAL EP 2	• Extreme pressure multipurpose grease for every application: joints, rings, gears, bearings. • Good resistance to water.	Enables to rationalize stocks and simplify maintenance operations.	2	Li / Ca	-25 °C to +130 °C	190	L-XBDHB 2	KP2K-25
MULTIS MS 2	• Extreme pressure multipurpose grease for applications under load, which may suffer shock and vibration.	Solid additives enable significant extension of the parts life. In case of accidental overheating, the presence of molybdenum disulfide will guarantee good lubrication and avoid any jamming or sticking.	2	Li / Ca / MoS ₂	-25 °C to +130 °C	150	L-XBCEB 2	MPF2K-25
LICAL MS 2	• Extreme pressure multipurpose grease, containing 3% MoS ₂ . • Recommended for industrial applications with shocks and vibrations, operating in a constraining environment (water, dust).	Very good resistance to high loads and shocks. Very good adhesiveness on metal surfaces.	2	Li / Ca / MoS ₂	-20 °C to +120 °C	210	L-XBCHB 2	KPF2K-20
MULTIS XHV 00	• Extreme pressure multipurpose grease for applications under load, at low speeds and with the risk of water washout.	Exceptional adhesiveness enables maintenance and shutdown time reductions.	00	Li / Ca	-20 °C to +100 °C	500	L-XBBHB 00	KP00H-20
MULTIS XHV 2	• Extreme pressure multipurpose grease for applications under high load, at low speeds with the risk of water washout. • Pre-eminently suitable as "Fifth wheel" grease in transport applications.		2	Li / Ca	-20 °C to +120 °C	1300	L-XBCHB 2	KP2K-20
MULTIS ZS 000	• Synthetic multipurpose grease for centralized lubrication systems when a NLGI 00/000 grade is required. • Typically for centralized system of vehicle chassis, trucks or public works machines.	Very good pumpability, even at very low temperatures. MAN • Willy Vogel • MB	00/000	Li / Ca	-45 °C to +120 °C	42	L-XECFB 00/000	MP00/000K-45
MULTIS XLT 2	• Very high-performance PAO synthetic grease for very high speeds and/or very low temperatures applications.	Facilitates start-up at very low temperatures. Compatible with plastics. Enables to achieve very high speed factors.	2	Li / Ca	-60 °C to +120 °C	18	L-XECEA 2	K2K-60

* Typical kinematic viscosity of base oil at 40 °C in mm²/s

COMPLEX LITHIUM SOAP GREASES

MULTIS COMPLEX products are high-performance greases made of complex lithium soap. Their high temperature resistant properties are very superior to those of lithium/calcium soap greases.

These greases are also characterized by their mechanical stability and excellent oil release properties.

PRODUCT	APPLICATIONS	SPECIFIC ADVANTAGES	NLGI GRADE	THICKENER	OPERATING TEMPERATURE RANGE	BO VISCOSITY*	SPECIFICATIONS		
							ISO 6743-9	DIN 51502	
MULTIS COMPLEX EP 2	<ul style="list-style-type: none"> • Extreme pressure multipurpose greases, high speeds. • For wheel bearings, ball bearings, roller bearings, plain bearings, seals... 	Enable inventory rationalization and simplify maintenance operations. Very good mechanical and thermal stability.	2	Li complex	-20 °C to +160 °C	165	L-XBEHB 2	KP2P-20	
MULTIS COMPLEX EP 3			3	Li complex	-20 °C to +160 °C	165	L-XBDHB 3	KP3N-20	
MULTIS COMPLEX HV 2			 <ul style="list-style-type: none"> • Extreme pressure multipurpose grease for loaded applications and high speeds. • For wheel bearings, ball bearings, roller bearings, plain bearings, seals... 	2	Li complex	-30 °C to +160 °C	340	L-XBEHB 2	KP2P-30
MULTIS COMPLEX HV 2 MOLY	<ul style="list-style-type: none"> • Extreme pressure grease for extremely loaded applications and high temperatures. 	Protection of metal parts, even with very high loads, thanks to solid Molybdenum disulphide addition.	2	Li complex / MoS ₂	-30 °C to +160 °C	340	L-XCEHB 2	KPF2P-30	
MULTIS COMPLEX XHV2 MOLY	<ul style="list-style-type: none"> • Extreme pressure grease containing 3% MoS₂. • Specially recommended for extreme loads and high temperatures in the mining industry. 	Excellent resistance to loads and shocks. Very good resistance to water, temperature changes and pollutions. Lengthening of lubrication intervals.	2	Li complex / MoS ₂	-20 °C to +160 °C	800	L-XDEHB 2	KPF2P-20	
MULTIS COMPLEX SHD 00	<ul style="list-style-type: none"> • Very high-performance PAO synthetic grease, for slow-to-moderate speed applications, over a wide range of temperatures and heavy loads. • Suitable for gearing in casings in which classical semi-fluid greases would not guarantee sufficient relubrication intervals. 	Low traction coefficient conducive to energy gains and an increase in the service life of the bearings. Operates at low temperatures.	00	Li complex	-50 °C to +160 °C	460	L-XEEHB 00	KP00P-50	
MULTIS COMPLEX SHD 32			2	Li complex	-50 °C to +160 °C	32	L-XEEHB 2	KP2P-50	
MULTIS COMPLEX SHD 100			2	Li complex	-50 °C to +160 °C	100	L-XEEHB 2	KP2P-50	
MULTIS COMPLEX SHD 220			2	Li complex	-40 °C to +160 °C	220	L-XEEHB 2	KP2P-40	
MULTIS COMPLEX SHD 460			1/2	Li complex	-40 °C to +160 °C	460	L-XEEHB 1/2	KP1/2P-40	
			<ul style="list-style-type: none"> • Very high-performance PAO synthetic grease, for moderate to high-speed applications, over a wide range of temperatures and heavy loads. • Recommended in electric engine bearings. 						
			<ul style="list-style-type: none"> • Very high-performance PAO synthetic grease, over a wide range of temperatures and heavy loads. • Recommended in papermaking: felt rolls... 						



Available in Lube-Shuttle cartridges

* Typical kinematic viscosity of base oil at 40 °C in mm²/s

COMPLEX ALUMINIUM SOAP GREASES

COPAL complex aluminium soap greases are characterized by their excellent adhesiveness to metal surfaces. The nature of the complex aluminium soap gives them very good resistance to water washout (standardized water spray test).
NB: complex aluminium soap greases are not compatible with the other types of greases.

PRODUCT	APPLICATIONS	SPECIFIC ADVANTAGES	NLGI GRADE	THICKENER	OPERATING TEMPERATURE RANGE	BO VISCOSITY*	SPECIFICATIONS	
							ISO 6743-9	DIN 51502
COPAL EP 00	<ul style="list-style-type: none"> Extreme pressure multipurpose and adhesive grease, for high temperatures. Suitable for shock loaded applications, travelling cranes, presses. 	Very good adhesiveness on metal surfaces.	00	Complex Al	-20 °C to +150 °C	165	L-XBDEB 00	KP00N-20
COPAL EP 2	<ul style="list-style-type: none"> Extreme pressure multipurpose and adhesive grease, for high temperatures. Suitable for shock loaded bearings, heavily loaded transmission, assemblies, travelling cranes, presses. 	Good adhesiveness on metal surfaces.	2	Complex Al	-20 °C to +150 °C	165	L-XBDHB 2	KP2N-20
COPAL MS 2	<ul style="list-style-type: none"> Extreme pressure multipurpose and adhesive grease for shock loaded applications with vibrations, over a wide range of temperatures. Suitable for boundary lubrication. 	Good adhesiveness on metal surfaces. Solid additives enable significant extension of the component life. In case of accidental overheating, the presence of molybdenum disulfide will guarantee good lubrication and avoid any jamming or sticking.	2	Complex Al / MoS ₂	-20 °C to +150 °C	165	L-XBDEB 2	KPF2N-20
COPAL GEP 0	<ul style="list-style-type: none"> Extreme pressure multipurpose and adhesive grease for heavy loads and high temperatures. Recommended for the lubrication of open gears, especially during the running-in period. 	Good adhesiveness on metal surfaces. Solid additives enable significant extension of the parts life.	0	Complex Al / Graphite	-20 °C to +150 °C	750	L-XBDHB 0	OGPF0N-20
COPAL OGL 0	<ul style="list-style-type: none"> Highly adhesive extreme pressure grease, for heavy loads and high temperatures. Applications in cement plants: open gears of kilns and mill drives. Applications in sugar mills: open gears in sugar cane mills. 	Excellent adhesiveness on metal surfaces. Dual solid addition, decreasing friction coefficient, limiting wear particularly near the tooth crest and tooth base, decreasing energy consumption. Very good resistance to water.	0/00	Complex Al / MoS ₂ / Graphite	-20 °C to +150 °C	> 1000	L-XBDHB 0/00	OGPF0/00N-20
COPAL OGL 2	<ul style="list-style-type: none"> Highly adhesive extreme pressure grease, for heavy loads and high temperatures. Specially developed for lubrication of open gears when a NLGI 2 grade is required. 		2	Complex Al / MoS ₂ / Graphite	-15 °C to +150 °C	> 1000	L-XBDHB 2	OGPF2N-15
COPAL SPRAY	<ul style="list-style-type: none"> Grease loaded with solid lubricants. For joints, open gears and cables. 	Enables local application of all surfaces.	1	Complex Al / Graphite	-30 °C to +120 °C	-	Aerosol	

POLYUREA THICKENER GREASES

ALTIS polyurea greases are top-of-the-range products specially designed for applications at high temperatures and high speeds. The polyurea thickener allows the greases to flow when subjected to heavy loads and speeds, and to revert to its initial state when at rest. **ALTIS** are consequently especially suitable in the case of filled for life lubrication or long lubrication intervals.

PRODUCT	APPLICATIONS	SPECIFIC ADVANTAGES	NLGI GRADE	THICKENER	OPERATING TEMPERATURE RANGE	BO VISCOSITY*	SPECIFICATIONS	
							ISO 6743-9	DIN 51502
ALTIS EM 2	<ul style="list-style-type: none"> Grease for high temperatures and high speeds. Typically used in electric engine bearings. 	Reduction of the vibration level. Allows long re-lubrication intervals.	2	Polyurea	-20 °C to +180 °C	110	L-XBFHA 2	KP2R-20
ALTIS MV 2	<ul style="list-style-type: none"> Grease for high temperatures, high speeds and medium-to-high loads. Typically used in fan bearings, roller bearings and direction systems in the dry parts of paper mills. 	Intermittent operating authorized. Allows long re-lubrication intervals.	2	Polyurea	-20 °C to +160 °C	160	L-XBEEB 2	KP2P-20

* Typical kinematic viscosity of base oil at 40 °C in mm²/s

■■■ POLYUREA THICKENER GREASES



PRODUCT	APPLICATIONS	SPECIFIC ADVANTAGES	NLGI GRADE	THICKENER	OPERATING TEMPERATURE RANGE	BO VISCOSITY*	SPECIFICATIONS	
							ISO 6743-9	DIN 51502
ALTIS SH 2	<ul style="list-style-type: none"> Very high-performance synthetic grease for a wide range of temperatures. Specially developed for 1st fill applications as part of lifelong lubrication. 	Reduction of the vibration level. Energy gains. Allows to reach high speeds over a wide temperature interval.	2	Polyurea	-40 °C to + 180 °C	80	L-XDFEB 2	KP2R-40
ALTIS HV 1	<ul style="list-style-type: none"> Extreme-pressure grease for high temperature applications and heavy loads. Recommended for segment 0 in continuous casting and pelleting presses. 		1	Polyurea	-20 °C to + 180 °C	500	L-XBFEB2	KP2R-20


COMPLEX CALCIUM SULFONATE SOAP GREASES

CERAN complex calcium sulfonate soap greases are high-technology products developed by TOTAL over many years.

The manufacturing process of calcium sulfonate soap greases requires genuine expertise to achieve the exceptional performance level of **CERAN**.

- Remarkable anti-wear and load resistance properties.
- Exceptional resistance to water, permitting operation in the presence of water contents greater than 40% of water, without any deterioration in performances, in specific cases.
- Excellent mechanical stability and high shearing resistance.
- Resistance at low temperature.
- Very good resistance to oxidation and corrosion.

PRODUCT	APPLICATIONS	SPECIFIC ADVANTAGES	NLGI GRADE	THICKENER	OPERATING TEMPERATURE RANGE	BO VISCOSITY*	SPECIFICATIONS	
							ISO 6743-9	DIN 51502
CERAN XM 100	<ul style="list-style-type: none"> Multipurpose, extreme-pressure, water-resistant grease. Recommended in the paper industry for high speeds. Heavy duty and off-road applications in civil engineering and industry. 	“NEW GENERATION” calcium sulfonate complex grease. Excellent water resistance. Enhanced anti-corrosion properties. Allows high speed applications.	1/2	Complex Ca sulfonate	-30 °C to +180 °C	100	L-XCFIB 1/2	KP1/2R-30
CERAN XM 220 	<ul style="list-style-type: none"> Multipurpose, extreme-pressure, water-resistant grease. Suitable for the lubrication of continuous castings and rolling mills in steel plants, bearings in wet and dry (felt rolls) sections of paper mills. Severe industrial applications (heavy loads, dust, water, high temperatures, etc.) 	“NEW GENERATION” calcium sulfonate complex grease. Excellent water resistance. Enhanced anti-corrosion properties. Enables inventory rationalization.	1/2	Complex Ca sulfonate	-30 °C to +180 °C	220	LXCFIB 1/2	KP1/2R-30
CERAN XM 220 MOLY 	<ul style="list-style-type: none"> Multipurpose, water-resistant grease, with 5% MoS₂ Grease for mining application in temperate to warm zones. Shock loaded applications in industry even in severely demanding environments (water, dust, high temperature). 	“NEW GENERATION” calcium sulfonate complex grease. Solid additives for prolonging part life. Water-resistant. Enhanced anti-corrosion properties.	1/2	Complex Ca sulfonate	-30 °C to +180 °C	220	L-XCFIB 1/2	KP1/2R-30
CERAN XM 460	<ul style="list-style-type: none"> Multipurpose, extreme-pressure, water-resistant grease. Shock loaded applications in industry even in severely demanding environment (water, dust, high temperature). Suitable for the lubrication of bearings in steel plants, in paper industry, for the lubrication of hard wood granular presses and in all industrial applications under severe conditions. 	“NEW GENERATION” calcium sulfonate complex grease. Excellent water resistance. Enhanced anti-corrosion properties.	1/2	Complex Ca sulfonate	-25 °C to +180 °C	460	L-XBFIB 1/2	KP1/2R-25
CERAN XM 720	<ul style="list-style-type: none"> Multipurpose, extreme-pressure, high viscosity, water-resistant grease. Heavy duty industrial applications (heavy loads, high temperatures, water, dust). Specially developed for extremely loaded applications such as steel industry. 	“NEW GENERATION” calcium sulfonate complex grease. Excellent thermal and mechanical stability. Excellent anti-oxidation and anti-corrosion properties.	1/2	Complex Ca sulfonate	-25 °C to +180 °C	720	L-XBFHB 1/2	KP1/2R-25

 Available in Lube-Shuttle cartridges

* Typical kinematic viscosity of base oil at 40 °C in mm²/s

■ ■ ■ COMPLEX CALCIUM SULFONATE SOAP GREASES



PRODUCT	APPLICATIONS	SPECIFIC ADVANTAGES	NLGI GRADE	THICKENER	OPERATING TEMPERATURE RANGE	BO VISCOSITY*	SPECIFICATIONS	
							ISO 6743-9	DIN 51502
CERAN XS 80	<ul style="list-style-type: none"> Full synthetic, extreme-pressure grease. Industrial applications with very wide temperature range required (-55 °C to + 180 °C). Suitable for high speeds applications. 	"NEW GENERATION" calcium sulfonate complex grease. Suitable for very low temperatures. Excellent water resistance. Reduces grease consumption (long life grease).	1/2	Complex Ca sulfonate	-55 °C to +180 °C	80	L-XEFFB 1/2	KP1/2R-55
CERAN XS 320	<ul style="list-style-type: none"> Full synthetic, extreme-pressure grease. Industrial applications with very wide temperature range required (-40 °C to + 180 °C). Good lubrication properties under severe conditions and high loads. 		1/2	Complex Ca sulfonate	-40 °C to +180 °C	320	L-XDFFB 1/2	KP1/2R-40
CERAN XS 40 MOLY	<ul style="list-style-type: none"> Full synthetic, extreme-pressure grease. with 5% MoS₂. Specially designed for arctic conditions in mining applications. Suitable for the lubrication of slewing rings. 	"NEW GENERATION" calcium sulfonate complex grease. Outstanding resistance to loads and shocks. Excellent water resistance. Suitable for very low temperatures.	1/2	Complex Ca sulfonate	-60 °C to +180 °C	40	L-XEFFB 1/2	KP1/2R-60
CERAN CA	<ul style="list-style-type: none"> Semi-fluid adhesive and extreme pressure grease for metal cables, rails, winches, chains. 	Extended life of parts subjected to heavy loads.	0	Complex Ca sulfonate	-25 °C to +150 °C	325	L-XBDIB 0	OGPON-25
CERAN AD PLUS	<ul style="list-style-type: none"> Highly adhesive, extreme pressure grease adapted to severe conditions. For metal cables, rails, winches, capstans, open gears and chains. Recommended in cement plants, mines, quarries, offshore. 	No loss of significant consistency on contact with water.	0/1	Complex Ca sulfonate	-20 °C to +150 °C	> 1700	L-XBDIB 0	OGPON-20
CERAN ST 2	<ul style="list-style-type: none"> Highly adhesive extreme pressure grease adapted to the presence of water, high temperatures and heavy loads. Multi-purpose applications in industry (coiler, rolling mill) and offshore environment (cables, gears, screen eccentric bearing). 	Lengthening of lubrication intervals. No significant loss of consistency even with high amounts of water in contact with the grease.	2	Complex Ca sulfonate	-25 °C to + 180 °C	180	L-XBFIB 2	KP2R-25
CERAN GEP	<ul style="list-style-type: none"> Adhesive and extreme pressure grease, adapted to high temperatures and heavy loads. For gears, transmissions. For open gears of sugar cane mills. 	Solid additives and good adhesiveness enable significant extension of the service life of the parts.	0	Complex Ca sulfonate / Graphite	-25 °C to + 180 °C	695	L-XBFHB 0	OGPF0R-25
CERAN MS	<ul style="list-style-type: none"> Extreme pressure multipurpose grease adapted to very heavy loads and very high temperatures, subject to shock loading and vibration. 	Solid additives enabling a significant extension of the service life of the parts.	1/2	Complex Ca sulfonate / MoS ₂	-20 °C to + 180 °C	650	L-XBFHB 1/2	KPF1/2R-20

SPECIAL GREASES


PRODUCT	APPLICATIONS	SPECIFIC ADVANTAGES	NLGI GRADE	THICKENER	OPERATING TEMPERATURE RANGE	BO VISCOSITY*	SPECIFICATIONS	
							ISO 6743-9	DIN 51502
CALORIS 23	<ul style="list-style-type: none"> Grease adapted to high temperatures and low speeds. 	Resistant to acid and alkaline atmospheres.	2/3	Bentone	-15 °C to +160 °C	500	L-XAEEA 2/3	M2/3P-15
CALORIS MS 23	<ul style="list-style-type: none"> Grease adapted to high temperatures, low speeds, heavy loads and a risk of shocks. 	Solid additives enabling a significant extended life of the parts. Resistance to acid and alkaline atmosphere.	2/3	Bentone / MoS ₂	-15 °C to +160 °C	500	L-XAEEA 2/3	MF2/3P-15
MARSON SY 00	<ul style="list-style-type: none"> Synthetic PAG grease adapted to heavy loads. For worm gear pairs, casing gears or fitted devices. 	Marked reduction in the friction coefficient. Permits lifelong lubrication in certain cases.	00	Li	-35 °C to +130 °C	145	L-XCCEB 00	GPGP00K-35
MARSON SY 2	<ul style="list-style-type: none"> Synthetic PAG grease adapted to heavy loads. For applications in contact with petroleum liquids dispensers. 	Resistant to hydrocarbon washout.	2	Li	-40 °C to +120 °C	145	L-XDCEA 2	MPPG2K-40

 * Typical kinematic viscosity of base oil at 40 °C in mm²/s

■ ■ ■ SPECIAL GREASES





PRODUCT	APPLICATIONS	SPECIFIC ADVANTAGES	NLGI GRADE	THICKENER	OPERATING TEMPERATURE RANGE	BO VISCOSITY*	SPECIFICATIONS	
							ISO 6743-9	DIN 51502
SPECIS CU	<ul style="list-style-type: none"> Anti-seizing grease for threaded assembly under severe corrosion conditions, water vapour, gasses. 	Easy dismantling of components in a moist atmosphere or wet environment. Seizing prevention.	1	Bentone / Copper	-20 °C to + 300 °C	500	L-XBGBB 1	MPF1U-20
SPECIS B 4851-2	<ul style="list-style-type: none"> Lubrication and protection of strands for pre-stressed concrete. Insulating grease adapted for electric cables. 	Protection against corrosion, even in a moist atmosphere and in the presence of seawater. In compliance with XP A 35-037.	2/3	Li	-15 °C to +120 °C	100	L-XBCFA 2/3	K2/3K-15
 AXA GA 3	<ul style="list-style-type: none"> Packer grease for autoclaves, reactors under pressure or in a vacuum, in the chemicals and other industries. 	Extended life of the equipment. Contribution to the air tightness of the equipment. NSF H1	3	Ca	0 °C to +100 °C	69	L-XABGA 3	K3G 0
STATERMIC XHT	<ul style="list-style-type: none"> Special fluorine compounds-base grease for very high temperatures and medium-to-heavy loads. 	Reduced friction coefficient of most plastics and metals. Extended life of the lubricated parts.	2	Fluorine	-25 °C to + 250 °C	147	L-XBGDB 2	KFKP2U-25
 STATERMIC NR	<ul style="list-style-type: none"> Special fluorine compounds-base grease for high temperatures, resistant to powerful acids, halogenated compounds, alcohols, oxidants and radiations. 	Protection of lubricated parts even in the presence of acids, halogenated alcohols, oxidants or in the presence of radiation. NSF H1	2	Fluorine	-25 °C to + 250 °C	375	L-XBGDB 2	KFKP2U-25

BIODEGRADABLE GREASES


PRODUCT	APPLICATIONS	SPECIFIC ADVANTAGES	NLGI GRADE	THICKENER	OPERATING TEMPERATURE RANGE	BO VISCOSITY*	SPECIFICATIONS	
							ISO 6743-9	DIN 51502
 BIOMULTIS EP 2	<ul style="list-style-type: none"> Biodegradable, multi-purpose, extreme pressure grease. Recommended for severe applications. 	Very good resistance to water washout. Ultimate biodegradability (> 60%) according to OECD 301-B. EAL Grease (Environmentally Acceptable Lubricants).	2	Li	-30 °C to +140 °C	150	L-XCEEB 2	KP2K-30
BIOMERKAN RS	<ul style="list-style-type: none"> Water-resistant biodegradable grease. Recommended for marine uses and agriculture. 	Resistance to water washout. Complies with BLUE ANGEL criteria vertrag n°11273. Ultimate biodegradability (> 60%) according to OECD 301-B.	3	Ca	-20 °C to + 90 °C	32	L-XBBEA 3	ME3E-20
BIOADHESIVE PLUS	<ul style="list-style-type: none"> Biodegradable grease, excellent adhesiveness and water resistance. Recommended for applications in marine and industry. Protection (Galle chains). 	Insoluble in water, leading to a remarkable resistance to water wash-out. Excellent anti-corrosion properties even in the presence of sea water. Ultimate biodegradability (> 60%) according to OECD 301-B. EAL Grease (Environmentally Acceptable Lubricants).	1	Ca	-20 °C to + 90 °C	320	L-XBBIA 1	ME1E-20
BIO OG PLUS	<ul style="list-style-type: none"> Extreme pressure, high adhesiveness biodegradable grease. Recommended for open gears. Applications in marine and industry. 	Specially formulated to minimize the impact on the marine environment. Ultimate biodegradability (> 60%) according to OECD 301-B. Very good resistance to water wash-out. Excellent anti-corrosion properties even in the presence of sea water.	0/1	Ca	-20 °C to + 90 °C	750	L-XBBIB0/1	OGE0/1E-20


NSF H1 GREASES FOR THE AGRIFOOD INDUSTRY

NSF NEVASTANE and **AXA GR1** greases are NSF H1 registered for their suitability for accidental food contact. These products are essential when a high level of hygiene is required. High-performance products, they protect equipment and prolong their service life whilst securing the production chain. **NEVASTANE** is the range specifically designed for the agrifood industry and its related activities such as the manufacture of packaging. It is also used in the pharmaceutical and the cosmetics industries.

PRODUCT	APPLICATIONS	SPECIFIC ADVANTAGES	NLGI GRADE	THICKENER	OPERATING TEMPERATURE RANGE	BO VISCOSITY*	SPECIFICATIONS	
							ISO 6743-9	DIN 51502
 AXA GR1	<ul style="list-style-type: none"> Multipurpose extreme-pressure grease. For bearings and joints. 	Protection against corrosion even in the presence of water. Extended life of equipment. NSF H1	1/2	Complex Ca	-20 °C to +150 °C	150	L-XBDIB 1/2	KP1/2N-20
NEVASTANE XMF 00	<ul style="list-style-type: none"> Multipurpose greases adapted to high and medium speeds in the agrifood industry. For centralised lubrication, bottling equipment, and plain bearings. 	Extended life of the equipment. Excellent protection against corrosion. Resistance to water. NSF H1 • Kosher • Halal ISO 21469	00	Complex Al	-20 °C to +150 °C	105	L-XBDFA00	K00N-20
NEVASTANE XMF 0			0				L-XBDFA0	K0N-20
NEVASTANE XMF 1			1				L-XBDFB1	KP1N-20
NEVASTANE XMF 2 			2				L-XBDFB2	KP2N-20
NEVASTANE HD2T	<ul style="list-style-type: none"> Multipurpose extreme pressure and anti-wear grease. For crimping machines, bottling machines, harvesting machines and all loaded bearings. 	Very good adhesive power on metal surfaces. Excellent protection against corrosion. Resistant to water washout. NSF H1 • Kosher • Halal ISO 21469	2	Complex Al	-20 °C to +150 °C	130	L-XBDHB 2	KP2N-20
NEVASTANE XS 80 	<ul style="list-style-type: none"> Full synthetic, extreme-pressure, high performance grease. Suitable for high speeds applications, heavy loads with very wide temperature range required. Recommended for pelleting machines. 	Suitable for very low temperatures. Excellent water resistance. Reduces grease consumption (long life grease). NSF H1 ISO 21469	1/2	Complex Ca sulfonate	-55 °C to +180 °C	80	L-XEFFB1/2	KP1/2R-55
NEVASTANE XS 220 	<ul style="list-style-type: none"> High-performance multipurpose synthetic grease, adapted to severe conditions in the agrifood industry. 	Very wide range of usage temperatures. Excellent water resistance. Reduces grease consumption (long life grease). NSF H1 ISO 21469	1/2	Complex Ca sulfonate	-40 °C to +180 °C	220	L-XDDIB1/2	KP1/2R-40
NEVASTANE XS 320	<ul style="list-style-type: none"> Full synthetic, extreme-pressure, high performance grease. Suitable for low and medium speeds applications. Good lubrication properties under severe conditions and high loads. Recommended for pelleting machines. 	Suitable for very low temperatures. Excellent water resistance. Reduces grease consumption (long life grease). NSF H1 ISO 21469	1/2	Complex Ca sulfonate	-40 °C to +180 °C	320	L-XDFFB1/2	KP1/2R-40

AUTOMATIC LUBRICATORS

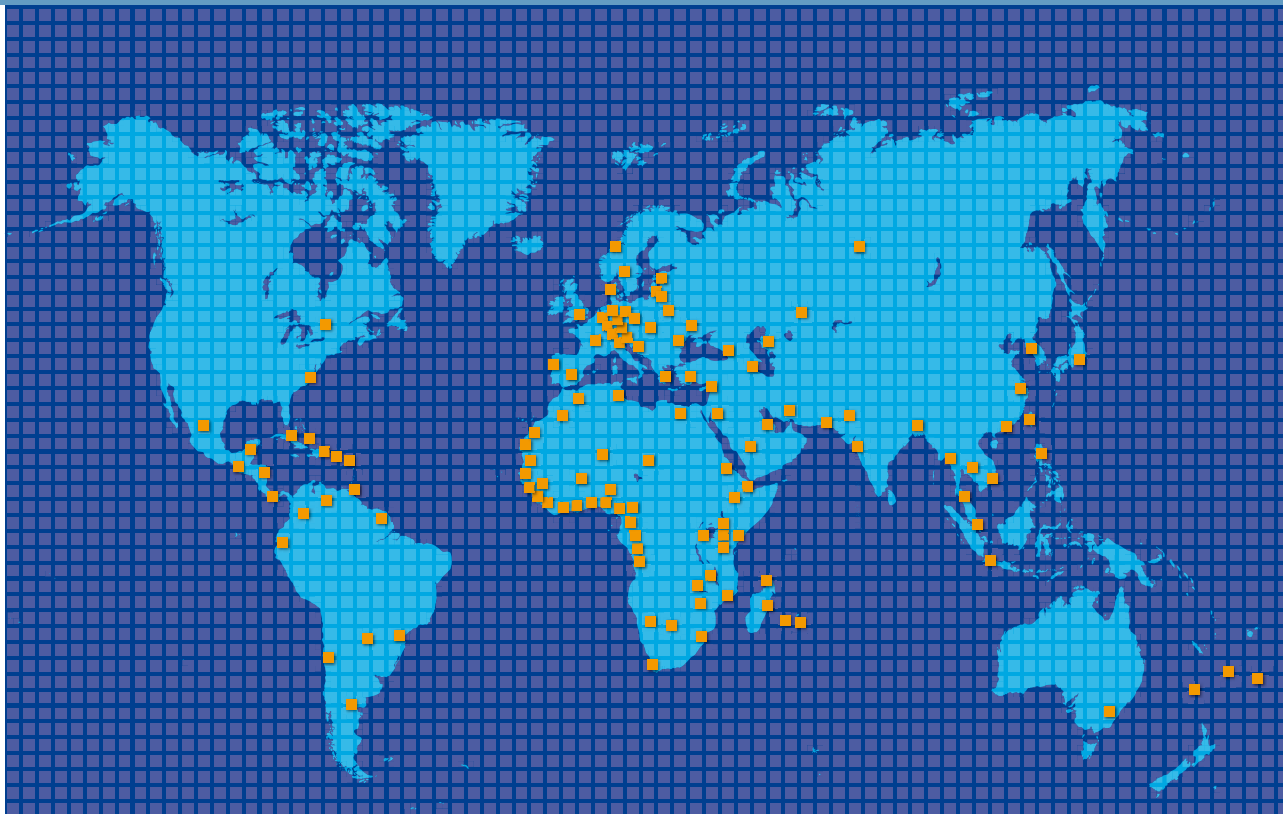
PRODUCT	APPLICATIONS	SPECIFIC ADVANTAGES	NLGI GRADE	THICKENER	RANGE OF USE	BO VISCOSITY*	SPECIFICATIONS	
							ISO 6743-9	DIN 51502
GREASYMAT Starterpack (automatic lubricator)	<ul style="list-style-type: none"> • Electro-mechanical automatic lubricator, single point, refillable. • 10 bar ejection pressure. 	Remote up to 2 meters from the lubrication point. Set up for a lubrication program of 1, 3, 6 or 12 months. ATEX certification.	To be used with GREASYMAT 240cc refills: CERAN XM 220, CERAN FG, NEVASTANE XS 80 and ALTIS SH2.					
GREASYMAT REFILL ALTIS SH 2	<ul style="list-style-type: none"> • Very high-performance synthetic grease for a wide range of temperatures. • Specially developed for the lubrication of fans and electric engines with the GREASYMAT automatic lubricator. 	Autonomous lubrication of inaccessible locations or equipment that requires re-lubrication at frequent intervals.	2	Polyurea	-40 °C to +180 °C	80	L-XDFEB 2	KP2R-40
GREASYMAT REFILL CERAN XM 220	<ul style="list-style-type: none"> • Multipurpose, extreme-pressure, water-resistant grease. • Suitable for the lubrication of conveyers, rails, chains with the GREASYMAT automatic lubricator. 		1/2	"NEW GENERATION" calcium sulfonate complex grease.	-30 °C to +180 °C	220	LXCFIB1/2	KP1/2R-30
 GREASYMAT REFILL NEVASTANE XS 80	<ul style="list-style-type: none"> • Full synthetic, extreme-pressure, high performance grease. • Suitable for high speeds applications, heavy loads with very wide temperature range required. • Recommended for the agrifood industry and / or very low temperatures, with the GREASYMAT automatic lubricator. 	Suitable for very low temperatures. Excellent water resistance. NSF H1	1/2	Complex Ca sulfonate	-55 °C to +180 °C	80	L-XEFFB1/2	KP1/2R-55

 NSF H1, suitable for incidental food contact

TECHNICAL DATA																	
Measuring kinematic viscosity																	
In the international measurement system, kinematic viscosity is expressed in mm ² per second.																	
ISO VG																	
The international ISO VG classification allows classification of oils according to viscosity. The ISO VG grade corresponds by convention to the median point of a kinematic viscosity interval in mm ² /s at 40 °C.																	
ISO classification des lubrifiants as a function of their viscosity (ISO 3448 standard)		NLGI Grade															
ISO viscosity class	Median kinematic viscosity at 40 °C in mm²/s	Kinematic viscosity range at 40 °C in mm²/s															
		Mini	Maxi														
ISO VG 2	2.2	1.98	2.42														
ISO VG 3	3.2	2.88	3.52														
ISO VG 5	4.6	4.14	5.06														
ISO VG 7	6.8	6.12	7.48														
ISO VG 10	10	9	11														
ISO VG 15	15	13.5	16.5														
ISO VG 22	22	19.8	24.2														
ISO VG 32	32	28.8	35.2														
ISO VG 46	46	41.4	50.6														
ISO VG 68	68	61.2	74.8														
ISO VG 100	100	90	110														
ISO VG 150	150	135	165														
ISO VG 220	220	198	242														
ISO VG 320	320	288	352														
ISO VG 460	460	414	506														
ISO VG 680	680	612	748														
ISO VG 1000	1000	900	1100														
ISO VG 1500	1500	1350	1650														
ISO VG 2200	2200	1980	2420														
ISO VG 3200	3200	2880	3520														
<p>The NLGI (National Lubricating Grease Institute) grade expresses the consistence of greases. Classification is carried out based on « worked penetration » at 25 °C.</p> <table border="1"> <thead> <tr> <th>NLGI grade</th> <th>Worked penetration at 25 °C (1/10th mm)</th> </tr> </thead> <tbody> <tr> <td>000</td> <td>445 - 475</td> </tr> <tr> <td>00</td> <td>400 - 430</td> </tr> <tr> <td>0</td> <td>355 - 385</td> </tr> <tr> <td>1</td> <td>310 - 340</td> </tr> <tr> <td>2</td> <td>265 - 295</td> </tr> <tr> <td>3</td> <td>220 - 250</td> </tr> </tbody> </table>				NLGI grade	Worked penetration at 25 °C (1/10 th mm)	000	445 - 475	00	400 - 430	0	355 - 385	1	310 - 340	2	265 - 295	3	220 - 250
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Abbreviations																	
<ul style="list-style-type: none"> HACCP: "Hazard Analysis and Critical Control Point". A risk analysis and critical control point method, in the agrifood industry. HSE: Health, Safety, Environment. FZG: Forschung für ZahnradGetriebe. Method for assessing the extreme-pressure properties of lubricants, ISO 14635 standard. PAG: Poly Alkylene Glycols PAO: Polyalphaolefins POE: Polyol Esters TOST: Turbine Oil Stability Test, ASTM D943 standard. 																	

STORAGE, SAFETY, HEALTH, ENVIRONMENT
Recommendations for storage
<ol style="list-style-type: none"> Store the products in a frost-free environment. Special case of soluble oils: storage between 5 °C and 40 °C. Store drums and kegs on their side with both bungs in a horizontal position (9h and 15h), to prevent drying-out of seals and admission of air. Store packaging on blocks insulating them from the ground. Once a year, turn them over to oil the non-immersed walls. If steps 1 and 2 cannot be implemented, store the drums upside down with the bungs at the bottom. <p>NEVER STORE PACKAGING UPRIGHT WITH BUNGS AT THE TOP AND OUTSIDE.</p>
Recommendations for use
<ol style="list-style-type: none"> Follow the FIFO system: first in, first out. Note opening date on the packaging. Wipe the surroundings of the openings. Close the packaging after each sampling.
Safety and health
<p>Virtually all the lubricants are non-flammable under ambient conditions. However, they need to be stored at a distance from:</p> <ul style="list-style-type: none"> Oxidizing, corrosive or inflammable substances: chlorine, oxygen, acids, bases, solvents, etc. Hot surfaces or fire points. Electric contacts. <p style="text-align: center;">For access to material safety data sheets please visit www.quickfds.com</p>
Environment
<p>The storage areas must permit easy recovery (pumping, absorption) in the event of accidental leaks, with no discharges into the natural environment. A tank or a holding facility is recommended, even mandatory, depending on the legislation in force.</p>

**Sales presence in over 150 countries
through the Subsidiaries and Distributors**



<http://www.lubricants.total.com/pro/industry.html>
Material Safety Data Sheets available at www.quickfds.com

TOTAL LUBRIFIANTS
562 avenue du Parc de l'île
92029 Nanterre Cedex - France



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