


ORLEN OIL
INDUSTRIAL

INDUSTRY
PRODUCT CATALOGUE

oils • greases • solvents

ORLEN OIL – OILS FOR INDUSTRY

Orlen Oil was established in 1998, as a collective undertaking of the largest Polish producers of lubricants, Petrochemia Płock, Rafineria Trzebinia, Rafineria Czechowice and Rafineria Jedlicze.
Currently, ORLEN OIL operates as a part of the Capital Group of Polski Koncern Naftowy ORLEN S.A., one of the largest petroleum corporations in the Central-East Europe.
ORLEN OIL is a leading producer and distributor of automotive, agricultural and industrial lubricants. With its wide range of products, ORLEN OIL meets expectations of both individual and corporate customers.
Our research and development efforts together with effective marketing activities have contributed to the success of PLATINUM - a range of top quality engine oils. ORLEN OIL is also the leader in the Polish market for industrial lubricants.
We focus on comprehensive lubrication solutions and consultancy services. In order to immediately adjust the offer to increasing quality standards in the market, the company is always ahead of technical trends.
Products offered by ORLEN OIL meet the requirements of strict international standards. All production processes are controlled by the Quality Management System according to ISO 9001:2008 and ISO 14001:2004.
ORLEN OIL is certified for conformance with the requirements of AQAP 2110:2009 System.

ORLEN OIL INDUSTRIAL

Implementing in new technologies, both in the automotive and industrial sectors, is a factor that forces the lubricant suppliers to develop products in order to meet the highest quality requirements.
The collaboration with worldwide additives suppliers involves also the basic and application tests and research into new technologies for the industrial oils and lubricants. While developing new product know-how, ORLEN OIL collaborates also with leading national scientific institutions, such as the Oil and Gas Institute in Krakow, the Institute for Fuels and Renewable Energy in Warsaw and AGH University of Science and Technology of Krakow.
Top quality of products and services is the priority of ORLEN OIL's mission. Our objective is to fully meet our customers' demands by producing and delivering products and services which meet their requirements regarding quality, environmental as well as health and safety regulations.
Superior quality of ORLEN OIL products is confirmed by the approvals of renowned automotive industry sector enterprises/businesses/firms (such as Mercedes-Benz, MAN, Renault, BMW, Volkswagen, Volvo, Daimler AG) and industrial equipment manufacturers (Flender, Denison Hydraulics, Siemens, Cincinnati Machine).
The implemented Quality Management System has created grounds for improvement of the processes and their continuous development. It has also contributed to the enhancement of the organisation management, also in terms of compliance with legal requirements, which ensures flexible and quick response to the needs of the market and clients.

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www.orlenoil.pl

HYDRAULIC FLUIDS

HYDROL® EXTRA L-HV

VISCOSITY GRADE:
ISO VG: 32, 46, 68
QUALITY CLASS:
ISO 11158 – HV
NORMS, APPROVALS, SPECIFICATIONS:
DIN 51524 part 3
APPROVALS:
Parker Denison HF-0, HF-1, HF-2
MEETS REQUIREMENTS:
Bosch Rexroth RE 90220-01; MAG/ Cincinnati Machine P-68, 70, 69; Eaton (Vickers) M-2950-S Eaton (Vickers) I-286-S; JCMAS HK-1 (ISO 32, 46)

GENERAL DESCRIPTION:
The hydraulic oil of high viscosity index and excellent shear stability. With a specifically designed formulation it prevents the formation of fatty acids and sludge in result of oil oxidation, especially in very severe operating conditions and high temperatures. Thanks to the outstanding performance characteristics it provides extended change intervals, it reduces downtime, the cost of repair and maintenance of hydraulic systems, and limits the number of breakdowns. The oil contains innovative enriching additives selected optimally to protect the oil system against corrosion. It has exceptional properties of surface anti-wear protection of the friction components in the hydraulic pump systems. It provides a very good filterability even in systems contaminated with small amounts of water. High viscosity index and excellent low temperature properties ensure operation in a wide range of temperatures and provide a smooth start--up at very low ambient temperatures.

APPLICATIONS:
Hydraulic oil HYDROL® EXTRA L-HV is designed primarily for the lubrication of mobile hydraulic construction and mining equipment working in very difficult conditions, variable temperature and humidity. The oil can be successfully used in stationary industrial machinery providing excellent lubrication for power transmission systems, the drive and hydraulic control of regulation and control mechanisms, hydraulic transmission, and other similar devices.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES		
ISO VG viscosity grade		32	46	68
kinematic viscosity at 40°C	mm^2/s	32.7	45.3	66.0
viscosity index	-	151	150	150
pour point	°C	-42	-39	-39
resistance to foaming - sequence 1 sequence 2 sequence 3	ml	20/0 30/0 20/0		

HYDROL® ARCTIC L-HV 32

VISCOSITY GRADE:
ISO VG: 32
QUALITY CLASS:
ISO 11158 – HV
DIN 51 502 – HVLP
NORMS, APPROVALS, SPECIFICATIONS:
DIN 51524 part 3

GENERAL DESCRIPTION:
Hydraulic oil with a very high viscosity index >250 and excellent low temperature properties. The oil contains innovative additives matched optimally to protect the oil system from corrosion and to provide very good surface anti-wear protection of the friction components in the hydraulic pump systems. Thanks to the outstanding performance characteristics the oil ensures a very wide range of operating temperatures and provides trouble-free start-up and operation in extremely low ambient temperatures.

APPLICATIONS:
The hydraulic oil HYDROL® ARCTIC L-HV 32 is designed for use in heavy duty drive systems, high-pressure constant and variable flow piston pumps and vane pumps, which require a high level of anti-wear properties of the oil, working in extremely low temperatures. The oil can be successfully used in hydraulic control systems and hydraulic systems that require very small changes in viscosity with temperature changes. Oils are used in all types of hydraulic devices that require the use of hydraulic oil with a very high viscosity index under varying operating temperatures from very low to very high.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
ISO VG viscosity grade		32
kinematic viscosity at 40°C	mm^2/s	33.6
viscosity index	-	254
pour point	°C	-55
flash point	°C	154
resistance to foaming - sequence 1 sequence 2 sequence 3	ml	10/0 30/0 10/0

HYDROL® PREMIUM L-HV

VISCOSITY GRADE:
ISO VG: 15, 22, 32, 46, 68, 100, 150
QUALITY CLASS:
ISO 11158 – HV
DIN 51524 part 3

GENERAL DESCRIPTION:
HYDROL ® PREMIUM L-HV hydraulic oils are manufactured basing on refined mineral oils and zinc free set of enriching additives. Features of the oil: good operating properties, perfect temperature - dependant viscosity grades (viscosity grade of ca. 150) enabling oil application in hydraulic systems operated in variable temperatures, high thermal and hydrolytic stability, high resistance to oxidation, high ability to transfer loads (FZG test, non-destructive load >12) and very good anti-wear properties, very good susceptibility to filtering, very good resistance to foaming, compatibility with sealants.

APPLICATIONS:
High durability of HYDROL® PREMIUM L-HV allows their application in heavy-duty power transmission systems as well as hydraulic drive and control systems operating in extremely high pressures and a wide range of temperatures. The new, unique formula used in the manufacturing process guarantees their extended life as compared to standard mineral hydraulic oils.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES						
ISO VG viscosity grade		15	22	32	46	68	100	150
kinematic viscosity at 40°C	mm^2/s	14.2	23.4	33.9	45.5	66.9	97.3	141.4
viscosity index	-	153	152	150	148	146	146	145
pour point	°C	-39	-37	-36	-34	-30	-28	-23
flash point	°C	191	195	202	210	221	233	241
resistance to foaming - sequence 1	ml	30/0	25/0	20/0	20/0	20/0	20/0	20/0

HYDROL® PREMIUM L-HM

VISCOSITY GRADE:
ISO VG: 15, 22, 32, 46, 68, 100, 150
QUALITY CLASS:
ISO 11158 – HV
DIN 51524 part 2
APPROVED BY:
L-HM 100 allowed in military technology of the Polish Armed Forces

GENERAL DESCRIPTION:
HYDROL® PREMIUM L-HM hydraulic oils are manufactured basing on refined mineral oils and zinc free set of enriching additives. Features of the oil: good operating properties, high thermal and hydrolytic stability, high resistance to oxidation, high ability to transfer loads (FZG test, non-destructive load >12) and very good anti-wear properties, very good susceptibility to filtering, very good resistance to foaming, compatibility with sealants.

APPLICATIONS:
High durability of HYDROL® PREMIUM L-HM allows their application in heavy-duty power transmission systems as well as hydraulic drive and control systems operating in extremely high pressures and a wide range of temperatures. The new, unique formula used in the manufacturing process guarantees their extended life as compared to standard mineral hydraulic oils.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES						
ISO VG viscosity grade		15	22	32	46	68	100	150
kinematic viscosity at 40°C	mm^2/s	14.7	22.8	32.4	44.5	67.2	97.5	143.8
viscosity index	-	102	102	102	102	102	96	96
pour point	°C	-34	-33	-28	-27	-26	-21	-18
flash point	°C	180	195	210	212	224	230	239
resistance to foaming - sequence 1	ml	40/0	40/0	25/0	25/0	25/0	20/0	20/0

HYDROL® L-HV

VISCOSITY GRADE:
ISO VG: 10, 15, 22, 32, 46, 68, 100, 150
QUALITY CLASS:
ISO 11158 – HV, DIN 51524 part 3
APPROVALS:
HYDROL® L-HV 32, 46, 100 - Eaton Vickers I-286 S
HYDROL® L-HV 15, 32 - TATRA TDS 120/48
HYDROL® L-HV 22, 32 - HYVA
HYDROL® L-HV 46 - LENA WILKÓW
HYDROL® L-HV 46 - MISTA Sp. z o.o.

GENERAL DESCRIPTION:
HYDROL®L-HV hydraulic oils are manufactured basing on high quality mineral base oils and additives. These oils are characterized by high anti-wear properties and additionally improved viscosity-heat properties, with respect to hydraulic oil-type L-HM. They provide extended service life, reduced friction wear of surface elements in the hydraulic pump systems, working in a wide temperature range while maintaining optimum viscosity properties (high viscosity index WL> 140).

APPLICATIONS:
Hydraulic oils HYDROL® L-HV are intended to use in heavy duty drive systems, constant and variable displacement high pressure piston pumps and vane pumps, which require a high level of anti-wear properties of the oil, and the precision hydraulic control systems and hydraulic systems that require small viscosity changes with varying temperatures.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES							
ISO VG viscosity grade		10	15	22	32	46	68	100	150
kinematic viscosity at 40°C	mm^2/s	9.7	14.5	22.6	31.6	47.2	68.8	98.9	146.4
viscosity index	-	152	150	150	150	145	145	142	140
pour point	°C	-40	-40	-39	-32	-34	-30	-30	-28
flash point	°C	165	178	192	205	210	226	232	239
resistance to foaming - sequence 1	ml	40/0	30/0	25/0	20/0	20/0	20/0	20/0	20/0

HYDROL® SPECIAL

VISCOSITY GRADE:
ISO VG: 32, 46, 68
QUALITY CLASS:
ISO 11158 – HM
NORMS, APPROVALS, SPECIFICATIONS:
DIN 51524 part 2

GENERAL DESCRIPTION:
High quality hydraulic oil with improved resistance to oxidation. With a specifically designed formulation it prevents the formation of fatty acids and sludge in result of oil oxidation, especially in very severe operating conditions and high temperatures. Thanks to the outstanding performance characteristics it provides extended change intervals, it reduces downtime, the cost of repair and maintenance of hydraulic systems, and limits the number of breakdowns. The oil contains innovative enriching additives selected optimally to protect the oil system against corrosion. It has exceptional properties of surface anti-wear protection of the friction components in the hydraulic pump systems. It provides a very good filterability even in systems contaminated with small amounts of water. In addition, the oil has a raised viscosity index and very good low temperature properties and can therefore be used in a relatively wide temperature range and facilitates start-up at low temperatures.

APPLICATIONS:
The Hydraulic oil HYDROL® SPECIAL is designed for the lubrication of power transmission systems, drive and hydraulic control regulation and control mechanisms, hydraulic transmission, and other similar devices. The oil designed to work in very difficult conditions, high temperatures and high humidity stationary and mobile machinery and industrial equipment as well as vehicles, construction and mining machinery. For use in systems where the manufacturer recommends hydraulic oil in the class according to ISO L-HM or DIN HLP, raised viscosity index ensures better work in a variable temperature range. Thanks to the exceptional properties it can be used in hydraulic systems for the manufacture of ceramic tiles.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES		
ISO VG viscosity grade		32	46	68
kinematic viscosity at 40°C	mm^2/s	32.8	44.8	67.3
viscosity index	-	115	115	115
pour point	°C	-39	-33	-30
resistance to foaming - sequence 1 sequence 2 sequence 3	ml	20/0 30/0 20/0		

HYDROL® L-HM/HLP

VISCOSITY GRADE:
ISO VG: 10, 15, 22, 32, 46, 68, 100, 150
QUALITY CLASS:
ISO 11158 – HM, DIN 51524 part 2
APPROVALS:
HYDROL® L-HM/HLP 32, 46, 68 - Denison Hydraulics HF0, HF1, HF2, MAG/Cincinnati Machine P-68, P-70, P-69, Bosch Rexroth RE 90220-01, HYDROL® L-HM/HLP 32, 46 - ZETOR (Proxima, Proxima Plus, Proxima Power, Forterra), FUM Poręba; HYDROL® L-HM/HLP 22, 32 - HYVA; HYDROL® L-HM/HLP 32 - EKOCEL; HYDROL® L-HM/HLP 68 - FAMUR, L-HM/HLP 46 i 68 - BUMECH SA; L-HM/HLP 22 - STALCO Industries Sp. z o.o.

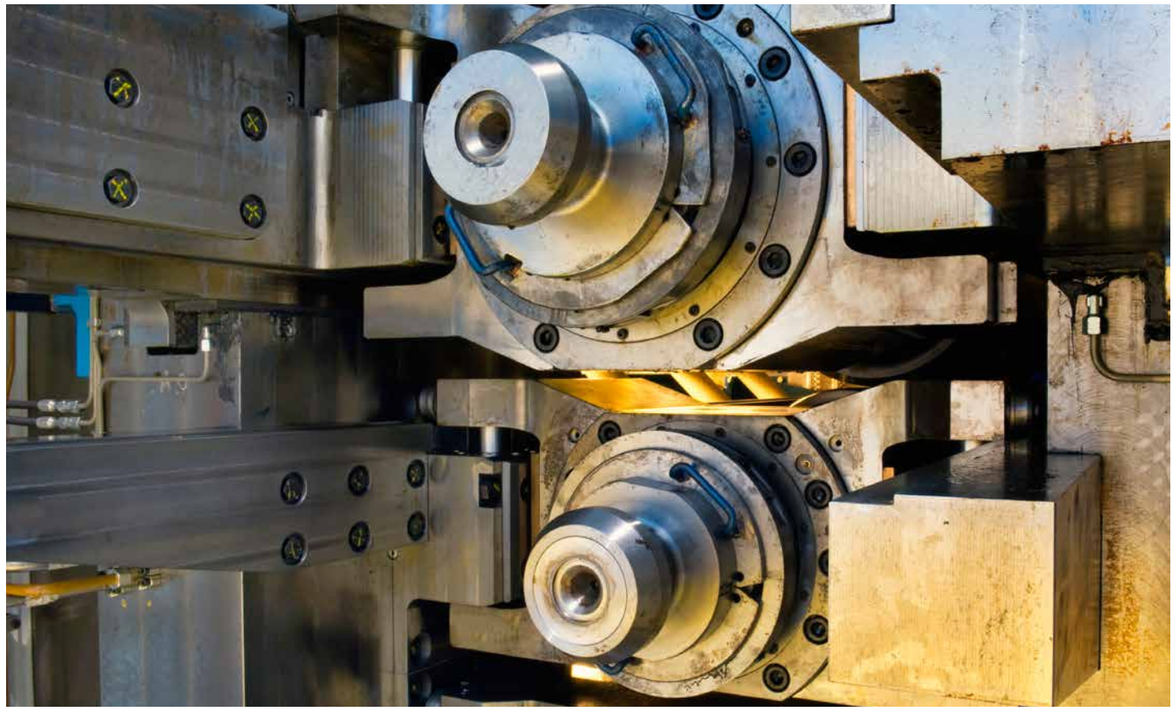
GENERAL DESCRIPTION:
HYDROL® L-HM/HLP oils for hydrostatic hydraulic systems are manufactured basing on high quality mineral base oils and a set of enriching additives improving the anti-wear, anti-corrosion and anti-oxidation properties. It ensures extended life and reduces the wear of friction parts in hydraulic pumps.

APPLICATIONS:
HYDROL ® L-HM/HLP hydraulic oils are intended mainly for heavy-duty power transferring systems and for hydraulic drive and control systems, i.e. hydraulic gears, control mechanisms and similar devices operating in harsh conditions or increased ambient temperature and humidity.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES							
ISO VG viscosity grade		10	15	22	32	46	68	100	150
kinematic viscosity at 40°C	mm^2/s	10.3	14.8	20.8	33.5	44.2	66.2	95.8	148.7
viscosity index	-	101	102	102	103	103	99	93	93
pour point	°C	-36	-35	-35	-34	-30	-30	-25	-22
flash point	°C	162	180	195	215	227	228	245	248
resistance to foaming - sequence 1	ml	50/0	50/0	50/0	30/0	30/0	30/0	20/0	20/0

Oils with viscosity grade of VG 32, 46 ,68, 100, 150 have been approved for application in mining and are granted a certificate issued by the Central Mining Institute, wich allows to mark the product with the safety sign.



HYDROL® HLPD

VISCOSITY GRADE:
ISO VG: 22, 32, 46, 68
MEETS REQUIREMENTS:
DIN 51524 part 2 – HLP (without testing of resistance to emulsification)
HYDROL HLPD 46 conforms also to MAN N 698

GENERAL DESCRIPTION:
HYDROL® HLPD cleaning hydraulic oils are manufactured basing on deep refined mineral base oil and a set of enriching additives with anti-wear, anti-oxidant and rust protection. Furthermore, the oils contain cleaning and dispersing additives which enable them to diffuse solid pollutants and to emulsify fluid pollutants which may appear in the system.

APPLICATIONS:
HYDROL® HLPD oils are intended for use in any kind of stationary or mobile hydraulic systems of machines and devices operating in normal and harsh conditions, especially on a continuous basis, and where there is the risk of polluting the system with water or condensed steam (e.g. in machine tool hydraulic systems where emulsion may penetrate into the system).

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES			
ISO VG viscosity grade		22	32	46	68
kinematic viscosity at 40°C	mm^2/s	23.0	33.5	45.3	66.8
viscosity index	-	110	102	102	99
pour point	°C	-30	-30	-27	-25
flash point	°C	217	217	225	232
resistance to foaming - sequence 1	ml	25/0	25/0	20/0	20/0

HYDROL® BIO HEES 32

VISCOSITY GRADE:
ISO VG: 32
QUALITY CLASS:
ISO 15380
VDMA 24568
MEETS REQUIREMENTS:
Bosch Rexroth RE 90221-01

GENERAL DESCRIPTION:
High quality, biodegradable synthetic hydraulic fluid, featuring very high oxidation resistance. Thanks to specifically selected ester base, the oil has very good viscosity and temperature properties, shear resistance and exceptional oxidation resistance with temperature. The oil is environment friendly, comprised almost in 90% of renewable raw materials, low toxicity. The fluid contains innovative, optimally selected refining additives, protecting the oil system against corrosion. Provides exceptional wear protection for frictional elements in hydraulic pump systems.

APPLICATIONS:
HYDROL® BIOHEES 32 hydraulic fluid is intended for lubrication of force, drive and hydraulic control transmission systems for adjusting and control mechanisms, hydraulic transmissions and other similar equipment, where hazard of the fluid penetration into ground water, soil and sewages exists. The fluid created for utilisation in any equipment operated for treatment of water, sewages, waste management, as well as canal locks. It is also designed for use in hydraulic systems of machines and systems operated in agriculture and mining.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 40°C	mm^2/s	33.5
viscosity index	-	201
pour point	°C	-39
flash point	°C	>200
FZG test – A/8.3/90	-	12

HYDROL® BIO HETG 46

VISCOSITY GRADE:
ISO VG: 46
MEETS REQUIREMENTS:
DMA 24 568 specification – HETG class (standard elaborated by German Association of Machine and Plant Manufacturers),
DIN 51524 part2 – HLP

GENERAL DESCRIPTION:
HYDROL® Bio HETG hydraulic oil with the viscosity grade of ISO VG 46 is manufactured basing on vegetable base oil and a set of specially selected enriching additives improving operation features of the ready-to-use product. Oil biodegradability determined according to CEC L-33-A-93 is 95%. The product features: very good anticorrosive and anti-wear properties, good rheological performance in low temperatures, good ability to separate water and good resistance to oxidation.

APPLICATIONS:
HYDROL® Bio HETG 46 hydraulic oil is intended for use in the following systems:
- dam control,
- circulating lubrication of turbine sets in hydro-power plants, or in all other hydraulic systems of machines and devices used in water intakes and dams, forestry and in agriculture.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
ISO VG viscosity grade		46
kinematic viscosity at temperature of 100°C at temperature of 40°C	mm^2/s	 6.80 46.7
pour point	°C	-30
rust prevention	rating	0 - A
resistance to foaming - sequence 1	ml	15/0

HYDROL® L-HL

VISCOSITY GRADE:
ISO VG: 15, 22, 32, 46, 68, 100, 150
QUALITY CLASS:
ISO 11158 – HL
DIN 51524 part 1
NO-91-A231: 1998 – for oil HYDROL® L-HL
VISCOSITY GRADE: 15, 32, 46
APPROVALS:
CHOFUM - HYDROL L-HL 46
NATO NSN 9150430014374 - HYDROL® L-HL 15

GENERAL DESCRIPTION:
HYDROL® L-HL oils for hydrostatic hydraulic systems are manufactured basing on high quality mineral base oils and a set of enriching additives improving the anti-wear, anti-corrosion and anti-oxidation properties.

APPLICATIONS:
HYDROL® L-HL hydraulic oils are intended for application in low-duty and medium-duty power transferring systems and in hydraulic drive and control systems of hydrostatic drive devices, operating in moderate temperatures.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES						
ISO VG viscosity grade		15	22	32	46	68	100	150
kinematic viscosity at 40°C	mm^2/s	15.2	21.6	32.3	44.3	65.6	103.7	150
viscosity index	-	102	103	103	101	98	93	93
pour point	°C	-35	-33	-30	-30	-27	-26	-24
flash point	°C	180	197	218	224	230	241	247
resistance to foaming - sequence 1	ml	50/0	50/0	30/0	30/0	30/0	20/0	20/0

Oils with viscosity grade of VG 32 ,46, 68, 100, 150 have been approved for application in mining and are granted a certificate issued by the Central Mining Institute, which entitles to mark the product with the safety sign.

ORLEN OIL H-515

APPROVALS:
Product has been granted a certificate of Air Force Institute of Technology in Warsaw, Poland, approving its application in aircrafts of Air Force of the Republic of Poland
MEETS REQUIREMENTS:
NO-91-A202; STANAG 3748 F&L (Edition 2) – Hydraulic Fluids, Petroleum (H-515 and H-520), MAS (AIR) 43-F&L/3748, 28 February 1985; MIL H-5606G; DEF STAN 91-48/1; PZL MIELEC; A.SIKORSKI COMPANY, SAMOLOT PZL M28

GENERAL DESCRIPTION:
Mineral hydraulic oil of high quality and purity, intended for aviation and ground-based industry. It is manufactured basing on specially selected mineral oil base and a set of enriching additives providing optimal viscosity, anti-wear, anti-corrosive, anti-oxidant and anti-foaming properties, and is manufactured through a special process ensuring the highest purity class.

APPLICATIONS:
It is intended for hydraulic systems, shock absorber units and hydraulic suppressors of aircrafts, and in hydraulic systems of ground-based devices (lifts, ultrasound cleaners, ground-based monitoring installations of hydraulic systems) in the following temperature range:
- no pressure systems: from -54°C to 90°C
- pressurised systems: from -54°C to 135°C.

It is also suitable for industrial and mobile hydraulic systems of machines and devices where excellent protective properties at low temperatures are crucial.

PARAMETERS	UNITS	TYPICAL VALUES
colour		red
kinematic viscosity at 100°C at 40°C at -40°C at -54°C	mm^2/s	 5.50 14.40 517 2490
pour point	°C	-67
flash point	°C	103
resistance to foaming - sequence 1, 2, 3	cm^3	40/0
cooper strip corrosion, 135°C, 72h	rating	1
base number	mg KOH/g	0.02

TRANSOL V 32

VISCOSITY GRADE:
ISO VG: 32
QUALITY CLASS:
DIN 51524 part 2 HLP
DIN 51517 part 3 CLP
APPROVALS:

VOITH TURBO 3625-006058 – HYDRODYNAMIC ADJUSTABLE TRANSMISSIONS WITH SKEW BEVEL GEAR AND SIZES FROM 1 TO 4, R B1-B4 TYPES,

VOITH TURBO 3625-006072 – HYDRODYNAMIC ADJUSTABLE CLUTCHES S TYPE AND HYDRODYNAMIC E TYPE TORQUE CONVERTERS,

VOITH TURBO 3625-006073 – HYDRODYNAMIC R TYPE ADJUSTABLE TRANSMISSIONS AND HYDRODYNAMIC EA / EH TYPE TORQUE CONVERTERS,

VOITH TURBO 3625-008426 – HYDRODYNAMIC R TYPE ADJUSTABLE TRANSMISSIONS – INCREASED LOAD CARRYING CAPACITIES

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 40°C	mm^2/s	31.1
viscosity index	-	105
pour point	°C	-36
flash point	°C	218
FZG test – A/8.3/90	-	>12

GENERAL DESCRIPTION:
High quality hydraulic-gear oil for industrial stationary clutches and hydraulic torque converters, produced of high quality, hydro refined mineral oils. Contains optimally selected improving additives, such as antioxidants, corrosion inhibitors, passivators for non-ferrous metals and EP additives. Its exceptional oxidation resistance provides elongated oil change intervals, lowers downtime and repair costs. It features very high oxidation resistance, high air expelling capacity, very high anti-corrosive and rust-resistance properties, very good anti-wear properties and good emulsification and foaming resistance.

APPLICATIONS:
TRANSOL V 32 oil is intended for use in hydrodynamic clutches and transmissions of machines operating in harsh conditions, among others in power generation and construction industries.

GALKOP

VISCOSITY GRADE:
ISO VG: 46, 68, 100, 150
QUALITY CLASS:
DIN 51 524 part 2-HLP
DIN 51 517 part 3-CL
APPROVALS:
GALKOP 46 HACO GROUP

GENERAL DESCRIPTION:
GALKOP hydraulic gear oils are manufactured basing on highly refined mineral oil and a set of additives with anti-corrosive, anti-oxidant and anti-wear properties.

APPLICATIONS:
GALKOP hydraulic gear oils are applied for lubrication of hydraulic systems and mechanic gears. They are intended for use in mining industry, and in machines for lubricating of the following:

- hydraulic systems of machines and mechanical devices,
- power transmission and drive units as well as hydraulic control units,
- in spur cylindrical gears, helical cylindrical gears and in bevel gears operated both on ground and underground in mining pits,
- and for all those applications where the manufacturer recommends application of HLP hydraulic oils or CLP gear oils.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES			
ISO VG viscosity grade		46	68	100	150
kinematic viscosity at 40°C	mm^2/s	45.5	68.5	96.5	145.4
viscosity index	-	100	100	97	94
pour point	°C	-26	-25	-24	-18
flash point	°C	215	220	225	240
resistance to foaming - sequence 1	ml	20/0	10/0	10/0	10/0

Oils with viscosity grade of VG 46 ,68, 100, 150 have been approved for application in mining and are granted a certificate issued by the Central Mining Institute, which allows to mark the product with the safety sign.

HYDROKOP® SYNTETIC

CONFORMS TO:
PN-EN ISO 12922/2003 (U)
7th Luxemburg Report (1994)
APPROVALS:
FAZOS, TAGOR, ZMG GLINIK

GENERAL DESCRIPTION:
HYDROKOP® SYNTETIC concentrate, intended to produce oil and water emulsion, is manufactured with synthetic hydrocarbons, water and enriching additives including corrosion inhibitors, emulsifiers and an anti-foaming additives. HYDROKOP® SYNTETIC concentrate produces micro emulsion offering good operational parameters, i.e.: high biodegradability (which is important in case of leakage and contamination of underground water), high emulsifying ability, high concentrate and micro emulsion stability, micro emulsion resistance to microbiological contamination, good anti-corrosive properties and low concentration of operating emulsion, compatibility with sealants. HYDROKOP® SYNTETIC concentrate is non-combustible.

APPLICATIONS:
HYDROKOP® SYNTETIC emulsifying concentrate in the form of water micro emulsion is mainly used as HFAE non-flammable hydraulic fluid in mining industry, in remotely or electro-hydraulically controlled roof supports and centrally or individually powered props. Recommended emulsion concentration is between 0.5 % to 2.0 %.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
Hydrokop® Synthetic emulsifying concentrate		
kinematic viscosity at 40°C	mm^2/s	50
water content	% (m/m)	50
0.5% oil and water emulsion with V water		
emulsion pH	–	9
stability test at 50°C/24h	–	pass

HYDROKOP® SEMISYNTETIC

CONFORMS TO:
PN-EN ISO 12922/2003 (U)
7th Luxemburg Report (1994)
APPROVALS:
FAZOS, TAGOR, ZMG GLINIK

GENERAL DESCRIPTION:
HYDROKOP® SEMISYNTETIC concentrate, intended to produce oil and water emulsion, is manufactured with highly refined mineral oils, water and enriching additives including corrosion inhibitors, emulsifiers and anti-foaming additive. The concentrate produces micro emulsion offering good operational parameters, i.e.: high biodegradability (which is important in the case of leakage and contamination of underground water), high emulsifying ability, high concentrate and micro emulsion stability, micro emulsion resistance to microbiological contamination, good anti-corrosive properties and low concentration of operating emulsion, compatibility with sealants. HYDROKOP® SYNTETIC concentrate is non-combustible.

APPLICATIONS:
HYDROKOP® SEMISYNTETIC emulsifying concentrate in the form of water based micro emulsion is used as HFAE non-flammable hydraulic fluid in mining industry, in remotely or electro-hydraulically controlled roof supports and centrally or individually powered props. Recommended emulsion concentration is between 0.4 % to 1.0 % with water of hardness of 28°N (up to 500 mg $CaC0_3/l$).

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
HYDROKOP® semi-synthetic emulsifying concentrate		
kinematic viscosity at 20°C	mm^2/s	12
kinematic viscosity at 40°C	mm^2/s	80
water content	% (m/m)	60
Requirements for 0.5% water-oil emulsion prepared on the reference water type V		
emulsion pH	–	8.5
stability at 70°C in 24h	–	pass

HYDRAULIC LIQUIDS FOR MINING INDUSTRY

HYDROKOP® MINERALNY

CONFORMS TO:
PN-EN ISO 12922/2003 (U)
7th Luxemburg Report (1994)
APPROVALS:
FAZOS, TAGOR, ZMG GLINIK

GENERAL DESCRIPTION:
HYDROKOP® MINERALNY emulsifying concentrate for the production of mineral water-oil emulsion is manufactured using highly refined mineral oils, water and additives including corrosion inhibitors, emulsifiers and the addition of antifoam. HYDROKOP® MINERALNY concentrate contains no sodium nitrite, is a non-flammable liquid to allow quick and easy preparation of the emulsion, is a product with a high dispersion of the oil phase of the emulsion – this allows the use of remote or electro-hydraulic controlled enclosure. Oil-water emulsion prepared on the basis of HYDROKOP® MINERALNY is characterized by good rust protection, as well as low working concentration of working emulsion, very good stability and resistance to microbiological contamination, a high degree of biodegradability (> 60% TEST MITI).

APPLICATIONS:
HYDROKOP® MINERALNY emulsifying concentrate in the form of water based micro emulsion is used as HFAE non-flammable hydraulic fluid in mining industry, in remotely or electro-hydraulically controlled roof supports and centrally or individually powered props. Recommended emulsion concentration is between 0.5 % to 2.0 % with water of hardness of 30°N.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
Hydrokop® Mineralny emulsifying concentrate		
kinematic viscosity at 40°C	mm^2/s	50
pour point	°C	-3
0,5% water and oil emulsion made of Hydrokop® Mineralny concentrate with V type reference water		
emulsion pH	–	8
stability at 60°C for 24h	–	pass

KONHYDR T

APPROVALS:
DOZUT-TAGOR
MEETS REQUIREMENTS:
as low-solidifying point liquid for transport and storage in low temperatures and protection of hydraulic components from corrosion, as per PN-EN ISO 12922:2003 and VII Luxemburg Report 1994.

GENERAL DESCRIPTION:
KONHYDR T is a low solidifying point, all-season liquid based on ethylene glycol. It contains enriching additives such as corrosion inhibitors, alkaline reserve stabilizers, foaming reducing agents and dye. The use of these additives makes KONHYDR T a perfect corrosion inhibitor in system elements. Low crystallisation prevents freezing of liquid and damage of equipment. The fluid should not be diluted with water because even a small addition will increase its crystallisation point and cause the loss of low temperature properties. The product contains no harmful substances such as nitrites, phosphates, amines and borates. Fluid components are biodegradable.

APPLICATIONS:
KONHYDR T fluid is designed for transport and temporary protection against corrosion of power hydraulic equipment components which are made of steel, copper, brass and aluminium. Due to compatibility with metals and elastomers used in hydraulic systems, the fluid is suitable and recommended for use in testing, transport and corrosion-protection of hydraulics in mining roof supports. It can be used as the operating medium in cooling systems as well as a liquid for spraying floors and wagons sides during winter in order to prevent freezing and lumping of the coal.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
density at 20°C	g/ml	1.076
kinematic viscosity at 20°C	mm^2/s	3.5
boiling point	°C	107
freezing	°C	-35
emulsion pH	–	7.0 - 9.0
colour	–	blue, clear

NON-FLAMMABLE HYDRAULIC FLUID

HYDRO FLUID HFC-46

MEETS REQUIREMENTS:
Requirements of 7th Luxemburg Report, Opinion issued by the Centre of Testing and Supervision of Underground Mining

GENERAL DESCRIPTION:
HYDRO FLUID HFC 46 is a slow-burning hydraulic fluid used for powering hydraulic systems of machines and devices using Vickers pumps, developed basing on glycol, a special set of enriching additives and demineralised water. HYDRO FLUID HFC 46 is non-toxic and biodegradable.

APPLICATIONS:
HYDRO FLUID HFC 46 is intended for use in hydraulic systems of machines and devices operating in extremely dangerous conditions i.e. in mining, coke industry, metallurgy e.g. in die-casting machines, hydraulic presses, heading machines, long-wall coal cutting machines, loaders, face conveyors, etc. and in other industries e.g. automotive industry.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
density at 15°C	°C	1.077
kinematic viscosity at 40°C	mm^2/s	46.4
viscosity index	-	226
pour point	°C	-40

TRANSGEAR PAG

VISCOSITY GRADE:
ISO VG: 150, 220, 320, 460
QUALITY CLASS:
DIN 51517 part 3 - CLP

GENERAL DESCRIPTION:
TRANSGEAR PAG synthetic oils for industrial gears are manufactured basing on polyalkylene glycols. They have been developed for use in extremely high loads and high temperatures. The product has the ability to transfer extremely high loads, it is highly resistant to aging and it provides perfect anti-corrosive protection (withstands ASTM D665 B procedure). It offers very good demulsifying characteristics, compatibility with commonly used leak stoppers, and contains no chlorine, sulphur and lead compounds.

APPLICATIONS:
TRANSGEAR PAG oils are intended to lubricate various devices and mechanisms working at the temperature over 200°C including: heavy-duty mechanical gears of industrial equipment, such as: spur cylindrical gears, helical bevel gears, spiral bevel gears and worm gears exposed to heavy thermal loads as well as rolling bearings and sliding bearings and reciprocating compressors.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES			
ISO VG viscosity grade	–	150	220	320	460
kinematic viscosity at 40°C	mm^2/s	150	237	325	433
viscosity index	–	195	177	196	220
pour point	°C	-30	-30	-30	-28
flash point	°C	191	231	225	225
copper strip corrosion plate 100°C/3h	rating	1b	1a	1b	1a
FZG test	failure load stage	>12			

TRANSGEAR PE

VISCOSITY GRADE:
ISO VG: 150, 220, 320, 460, 680
QUALITY CLASS:
DIN 51517 part 3 – CLP
Cincinnati Machine P-74
APPROVALS:
FLENDER AG – all products;
TRANSGEAR PE 220 – GLIMAG, BUMECH SA,
TRANSGEAR PE 320 – GLIMAG, FAMUR,
RYFAMA, BUMECH SA,
MEETS REQUIREMENTS:
US Steel 224; AGMA 9005-EO2 (EP)
David Brown S1.53.101 type E

GENERAL DESCRIPTION:
TRANSGEAR PE industrial gear synthetic oils are produced basing on poly-alpha-olefins (PAO) and esters as well as specially selected enriching additives. They have been developed for use in extremely high loads and high temperatures. The product has the following characteristics: the ability to transfer extremely high loads and perfectly protect gear elements from micro pitting, high resistance to aging and high anti-corrosive protection, perfect filterability, a wide range of operating temperatures, extended change period.

APPLICATIONS:
TRANSGEAR PE oils are intended to lubricate all kinds of heavy-duty toothed gears of industrial machines and devices at risk of micro pitting, operating in temperatures up to 180°C, including: spur cylindrical gears, helical bevel gears, spiral bevel gears and worm gears calenders exposed to heavy thermal loads as well as rolling bearings and sliding bearings. Due to their unique lubricating and anti-oxidation properties they are also recommended for lubricating wind turbine gears operating in harsh conditions.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES				
ISO VG viscosity grade	–	**150**	**220**	**320**	**460**	**680**
kinematic viscosity at 40°C	mm^2/s	152	220	330	450	690
viscosity index	–	147	149	153	150	148
pour point	°C	-38	-38	-36	-33	-30
flash point	°C	240	255	270	285	290
copper strip corrosion plate 100°C/3h	rating	1b	1b	1b	1b	1b
foaming resistance: sequence I sequence II sequence III	ml	- - -	50/0 60/0 10/0	30/0 60/0 0/0	30/0 40/0 0/0	0/0 0/0 0/0
FZG test	non-destructive loading stand	>12				

TRANSOL® SP

VISCOSITY GRADE:
ISO VG: 68, 100, 150, 220, 320, 460, 680, 1000
QUALITY CLASS:
ISO 12925-1 CKC/CKD
APPROVALS:
TRANSOL® SP 68 – CHOFUM-OBRABIARKI
TRANSOL® SP 220 – GLIMAG, FMG PIOMA SA
TRANSOL® SP 320 – GLIMAG, FMG PIOMA SA, REMAG, RYFAMA
MEETS REQUIREMENTS:
PN-90/C-96056, DIN 51517 cz. 3, US Steel 224, AGMA/ANSI 9005-E02; ISO 12925-1 CKC/CKD

GENERAL DESCRIPTION:
TRANSOL® SP industrial gear oils are made from selectively refined mineral oils; they contain lead free additives improving lubricating properties (sulphur-phosphorus type) and a set of anticorrosive, antifoaming, anti-emulsifying additives as well as additives increasing resistance to oxidation. The oils ensure protection from excessive operational wear to gear elements, i.e. toothed wheels, as well as rolling and sliding bearings in normal operation and in the case of impact loads, protection of gear elements made from steel and non-ferrous elements from corrosion and the chemical impact of active ingredients of oil and its oxidation products; due to high thermo-oxidant stability they ensure prolonged operation at increased temperatures with no compromise to properties.

APPLICATIONS:
TRANSOL® SP oils are intended to lubricate heavy-duty mechanical gears of industrial equipment, often transferring impact loads e.g. rolling equipment in metallurgical machines, construction machinery, cement mill machines, lifts and transport equipment in shipbuilding industry, machine tools, steam and gas turbine gears, paper industry machines, and other equipment.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES							
ISO VG viscosity grade		68	100	150	220	320	460	680	1000
kinematic viscosity at 40°C	mm^2/s	66	98	152	223	320	446	650	980
viscosity index	-	102	100	99	98	98	95	94	94
pour point	°C	-28	-24	-23	-23	-20	-18	-15	-12
flash point	°C	223	230	232	240	240	245	250	250
resistance to foaming - sequence I sequence II sequence III	ml	10/0 30/0 10/0	10/0 30/0 10/0	5/0 5/0 5/0	0/0 0/0 0/0	10/0 10/0 10/0	10/0 10/0 10/0	10/0 10/0 10/0	0/0 0/0 0/0
ability to transfer loads at the FZG stand	failure load stage	>12							

TRANSOL® CLP

VISCOSITY GRADE:
ISO VG: 68, 100, 150, 220, 320, 460, 680, 1000
QUALITY CLASS:
ISO 12925-1 CKC/CKD, ISO – L – CKD
APPROVALS:
TRANSOL CLP 100, 150, 220, 320, 460 -
FL SMIDT MAAG Gear - GEARS 60752
TRANSOL CLP 150, 220, 320 -
Schuller - Müller Weingarten - DT 55 055
TRANSOL CLP 220 - BUMECH SA, GLIMAG
TRANSOL CLP 320 - BUMECH SA, GLIMAG
MEETS REQUIREMENTS:
DIN 51517 cz. 3, US Steel 224, AGMA/ANSI 9005-E02, ISO 12925-1 CKC/CKD
US Steel 224, AGMA/ANSI 9005-E02
ISO 12925-1 CKC/CKD

GENERAL DESCRIPTION:
TRANSOL® CLP industrial gear oils are made from selectively refined mineral oils. They ensure protection from excessive operational wear to gear elements, i.e. toothed wheels as well as rolling and sliding bearings in normal operation and in the case of impact loads, protection of gear elements made from steel and non-ferrous elements from corrosion and the chemical impact of active ingredients of oil and its oxidation products; due to high thermo-oxidant stability they ensure prolonged operation at increased temperatures with no compromise to properties.

APPLICATIONS:
TRANSOL® CLP oils are intended to lubricate heavy-duty mechanical gears of industrial devices often transferring impact loads e.g. rolling devices in metallurgical machines, construction machines, cement mill machines, lifts and transport devices in shipbuilding industry, machine tools, steam and gas turbine gears, paper industry machines, and other equipment operating at temperatures up to 120°C, requiring oils with increased resistance of the lubricating film (they contain Extreme Pressure (EP) additives), good thermo-oxidant stability at higher temperatures and good demulsifying and rust protection (to iron and non-ferrous metals).

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES							
ISO VG viscosity grade		68	100	150	220	320	460	680	1000
kinematic viscosity at 40°C	mm^2/s	74	103	152	223	299	446	695	990
viscosity index	-	102	98	99	98	94	94	95	95
pour point	°C	-28	-28	-27	-27	-22	-17	-16	-14
flash point	°C	230	233	236	238	242	246	250	257
ability to transfer loads at the FZG stand	of non-destructive load	>12							

TRANSOL®

VISCOSITY GRADE:
ISO VG: 68, 100, 150, 220, 320, 460, 680
QUALITY CLASS:
ISO 12925-1 CKC/CKD
MEETS REQUIREMENTS:
DIN 51517 part 3, US Steel 224,
AGMA/ANSI 9005-E02
ISO 12925-1 CKC/CKD

GENERAL DESCRIPTION:
TRANSOL® industrial gear oils are made from selectively refined mineral oils; they contain lead free additives improving lubricating properties (sulphur type) and a set of anticorrosive, antifoaming, anti-emulsifying additives as well as additives increasing resistance to oxidation. They ensure protection from excessive operational wear to gear elements, i.e. toothed wheels, as well as rolling and sliding bearings in operation, protection of gear elements made from steel and non-ferrous elements from corrosion and the chemical impact of active ingredients of oil and its oxidation products; due to high thermo-oxidant stability they ensure prolonged operation at increased temperatures with no compromise to properties.

APPLICATIONS:
TRANSOL® oils are intended to lubricate medium-duty mechanical gears of industrial equipment often transferring impact loads e.g. rolling devices in metallurgical machines, construction machines, cement mill machines, lifts and transport equipment in shipbuilding industry, machine tools, steam and gas turbine gears, paper industry machines, and other equipment operating at temperatures up to 100°C, requiring oils with increased resistance of the lubricating film (they contain Extreme Pressure (EP) additives), good thermo-oxidant stability at higher temperatures and good demulsifying and anti-corrosive properties (to iron and non-ferrous metals).

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES						
ISO VG viscosity grade		68	100	150	220	320	460	680
kinematic viscosity at 40°C	mm^2/s	74.4	102	142	212	299	458	690
viscosity index	-	197	96	96	94	93	91	90
pour point	°C	-28	-26	-25	-25	-22	-20	-18
flash point	°C	223	235	240	245	248	250	253
resistance to foaming - sequence 1 sequence 2 sequence 3	ml	10/0 30/0 10/0	10/0 30/0 10/0	10/0 20/0 10/0	10/0 10/0 10/0	10/0 10/0 10/0	10/0 10/0 10/0	0/0 0/0 0/0
ability to transfer loads at the FZG stand	of non-destructive load	11						

OILS FOR AIR AND GAS COMPRESSORS

CORALIA PAG 46

VISCOSITY GRADE:
ISO VG 46
APPROVED BY:
Allowed to use in aerospace technology of the Polish Armed Forces
WUCH DĘBICA; PZL - Dębica SA - Allowed to use in motor screw compressor units, for pumping LPG and CNG

GENERAL DESCRIPTION:
CORALIA PAG 46 is a fully synthetic compressor oil made basing on poly-alkylene-glycols (PAG), intended for lubrication of compressors for hydrocarbon gases. The oil features: low mixability with hydrocarbon gases, reduction of the risk of oil film degradation, exceptional lubricating properties as compared to alternative synthetic solutions and mineral oils, high viscosity index extending compressor life by ensuring effective operation in a broad range of temperatures, very high thermal stability and unique lubricating properties, which add to the system cost-efficiency, reduction of equipment downtime and reduction of maintenance cost.

APPLICATIONS:
CORALIA PAG 46 oil is intended for use with screw compressors, for compressing natural gas, LPG and other hydrocarbon gases. Low dissolving ability of CORALIA PAG 46 to those gases reduces the risk of loss of viscosity, as a result of dissolving with the gas being compressed, maintaining high level of operating properties.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
density at 20°C	g/cm^3	0.983
kinematic viscosity at 40°C at 100°C	mm^2/s	42.0 8.3
pour point	°C	-50
flash point	°C	242
acid number	mg KOH/g	0.10
water content	ppm	<0.03

CORALIA PE 46, 68

VISCOSITY GRADE:
ISO VG 46, 68
NORMS, APPROVALS, SPECIFICATIONS:
ISO 6743-3 DAJ

GENERAL DESCRIPTION:
CORALIA PE 46 and 68 are high quality compressor oil produced on the basis of a modern fully synthetic, ashless technology. Its composition contains the innovative, optimally selected additives that ensure extended change intervals. It has been designed for the lubrication of compressors working in difficult conditions. The use of a synthetic PAO base (polyalphaolefin) allows to provide exceptional thermal stability and resistance to oxidation, so that the oil can work at high temperatures and under a considerable load. Characterized by low sediment formation while preserving the clean working elements, a high thermo-oxidative stability, outstanding lubricating properties, excellent capacity to extract water from the system, a very good anti-corrosion and antifoam properties.

APPLICATIONS:
The synthetic CORALIA PE 46 and 68 oils are designed for the lubrication of:
- rotary vane air compressors
- various types of screw air compressors (e.g., portable compressors that are used in construction, railways industry, etc.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES	
ISO VG viscosity grade		46	68
kinematic viscosity at 40°C	mm^2/s	44.3	63
viscosity index	-	140	136
pour point	°C	-52	-51
flash point	°C	260	256
air release	min.	< 1	< 3

CORALIA T 46

VISCOSITY GRADE:
ISO VG: 46
QUALITY CLASS:
ISO L-DAH, L-TSE, L-TGE, L-HL, DIN 51524 part 1

GENERAL DESCRIPTION:
The compressor oil Coralia T 46 is manufactured from high quality, hydrotreated mineral oils. It contains innovative optimally selected enriching additives such as antioxidants, corrosion inhibitors, non-ferrous metals passivators and EP additives. Thanks to unique feature of oxidation resistance it ensures extended oil change intervals, reduces down-time and repair costs. It has very high resistance to oxidation, high capacity for air release, very good anticorrosive and antirust properties, very good antiwear properties, excellent resistance to emulsification and foaming..

APPLICATIONS:
The oil is intended for the lubrication of rotary air compressors used primarily in the energy sector operating under moderate conditions. It can also be used as a hydraulic fluid in the turbine control systems and for lubricating circulation systems of steam, gas and water turbines.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
ISO VG viscosity grade		46
kinematic viscosity at 40°C	mm^2/s	43.1
pour point	°C	-12
demulsibility at 54°C	min.	10
oxidation stability RBOT	min.	> 500

CORALIA VDL

VISCOSITY GRADE:
ISO VG: 32, 46, 68, 100
QUALITY CLASS:
DIN 51506 – VB-L, VC-L, VD-L, ISO 6743 – DAB, DAC, DAG, DAH, DAJ

GENERAL DESCRIPTION:
CORALIA VDL air compressor oil is manufactured basing on deep refined mineral base oil and a set of enriching additives improving operating features of the ready-to-use product. Features of the product: very good anticorrosive and anti-wear properties, good resistance to oxidation, good air releasing and low susceptibility to foaming.

APPLICATIONS:
CORALIA VDL oils are intended to lubricate in standard and difficult conditions of the following:
- piston compressors where temperature of compressing end ranges from 160 to 220°C,
- screw compressors with or without oil injection,
- vane compressors with oil injection.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES			
ISO VG viscosity grade		32	46	68	100
kinematic viscosity at 40°C kinematic viscosity at 100°C	mm^2/s	31.1 5.2	44.8 6.5	66.1 8.3	94.9 10.4
pour point	°C	-10	-9	-9	-9
flash point	°C	214	225	230	246
acid number	mg KOH/g	0.23	0.22	0.22	0.22
resistance to oxidation, carbon residue	% (m/m)	0.011	0.012	0.018	0.021

CORALIA L-DAB

VISCOSITY GRADE:
ISO VG: 32, 46, 68, 100, 150
MEETS REQUIREMENTS:
PN-91/C-96073

GENERAL DESCRIPTION:
CORALIA L-DAB oils for piston air compressors are made by petroleum processing, and contain ash-free or low-ash additives of anti-oxidant and rust protection action.

APPLICATIONS:
CORALIA L-DAB air compressor oils are intended for lubrication of piston and vane air compressors with drop lubrication in medium-duty operation mode. While assessing the compressor operating conditions (light, medium, heavy-duty), the following factors should be considered:
- compressor design (number of stages, cooling mode),
- ambient conditions (coolant and intake air temperature),
- operating conditions (continuous or intermittent operation).

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES				
ISO VG viscosity grade		32	46	68	100	150
kinematic viscosity at 40°C	mm^2/s	30.6	42.9	65.2	96	147
viscosity index	-	97	97	95	95	91
pour point	°C	-18	-18	-14	-14	-11
flash point	°C	220	224	240	246	250
ash residue	% (m/m)	0.01	0.01	0.01	0.01	0.013

CORALIA L-DAA

VISCOSITY GRADE:
ISO VG: 32, 46, 68, 100, 150, 220/320
MEETS REQUIREMENTS:
PN-91/C-96073

GENERAL DESCRIPTION:
CORALIA L-DAA oils for piston air compressors are made by petroleum processing, and may contain ash-free or low-ash additives of anti-oxidant and rust protection action.

APPLICATIONS:
CORALIA L-DAA air compressor oils are intended for lubrication of piston and vane air compressors with drop lubrication in light-duty operation mode. While assessing the compressor operating conditions (light, medium, heavy-duty), the following factors should be considered:
- compressor design (number of stages, cooling type),
- ambient conditions (coolant and intake air temperature),
- operating conditions (continuous or intermittent operation).

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES					
ISO VG viscosity grade		32	46	68	100	150	220/320
kinematic viscosity at 40°C	mm^2/s	33.8	42.3	70.5	94.9	155	19.8 (at 100°C)
viscosity index	-	95	95	92	90	90	90
pour point	°C	-15	-14	-12	-12	-10	-13
flash point	°C	218	223	230	238	240	245
ash residue	% (m/m)	0.005	0.005	0.01	0.015	0.018	0.008

OILS FOR AIR AND GAS COMPRESSORS

CORALIA VACUUM

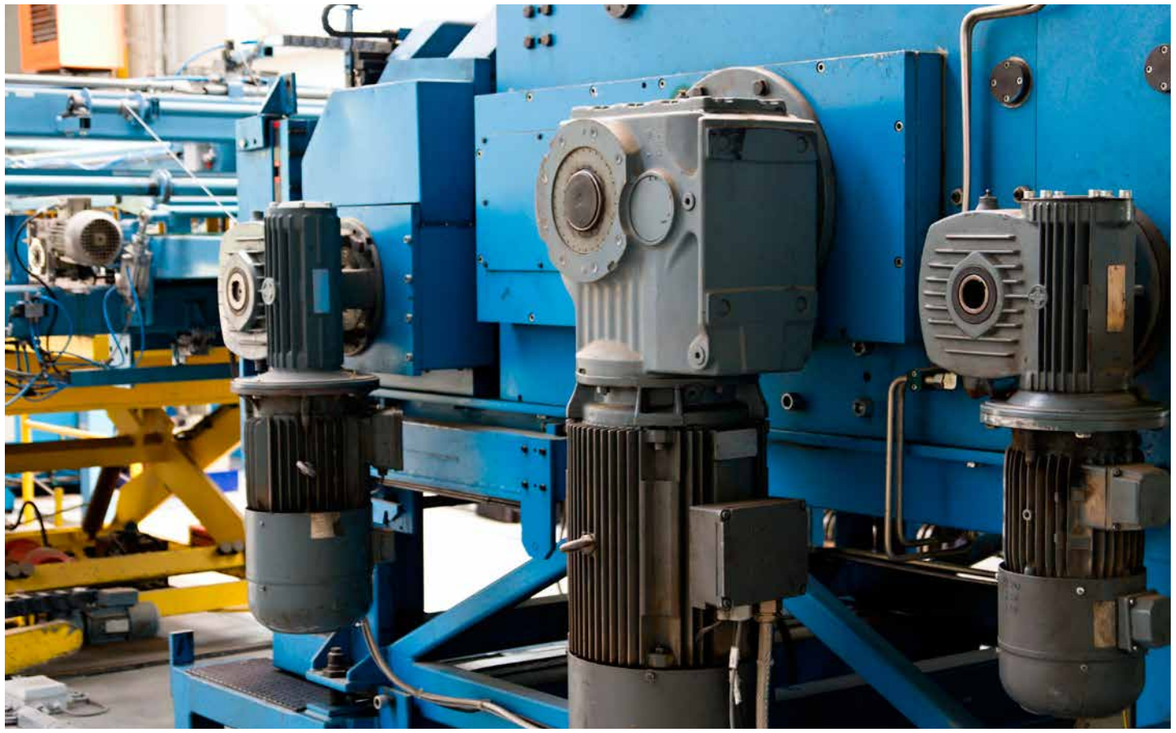
VISCOSITY GRADE:
ISO VG: 100

GENERAL DESCRIPTION:
Vacuum pump CORALIA VACUUM oil is made from high quality mineral oil through the process of high vacuum distillation. Features: good lubricating properties, chemical and thermal stability, low evaporative tendency and resistance to forming of sludge and residues.

APPLICATIONS:
Vacuum pump CORALIA Vacuum oil is intended for rotary vacuum pumps.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
ISO VG viscosity grade		100
kinematic viscosity at 40°C	mm^2/s	99.0
solidification point	°C	-11
flash point	°C	266
ash residue	% (m/m)	0.010



OILS FOR REFRIGERATING COMPRESSORS

FRIGOL WZ

MEETS REQUIREMENTS:
PN-74/C-96072

GENERAL DESCRIPTION:
Oils for refrigerating compressors are made through the process of refining oil fractions from no-paraffin conservative processing of petroleum.

APPLICATIONS:
FRIGOL WZ oil is intended for lubrication of ammonia and acid-carbon refrigerating compressors with the evaporator temperature reaching - 45°C, e.g. one-step, low-speed lying compressors. FRIGOL WZ oil is also suitable for filling of shock absorbers.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 20°C	mm^2/s	31.9
kinematic viscosity at 40°C	mm^2/s	13.4
flash point	°C	164
solidification point	°C	-45
ash residue	% (m/m)	0.004

FRIGOL TZ

MEETS REQUIREMENTS:
PN-74/C-96072

GENERAL DESCRIPTION:
Oils for refrigerating compressors are made through the process of refining oil fractions from no-paraffin conservative processing of petroleum.

APPLICATIONS:
FRIGOL TZ 13 oil is intended for lubrication of ammonia refrigerating compressors with the evaporator temperature reaching - 50°C, e.g. two-step units with circulatory lubrication.
FRIGOL TZ 19 oil is intended for lubrication of ammonia refrigerating compressors with the evaporator temperature reaching - 30°C, e.g. two-way units with circulatory lubrication.
FRIGOL TZ-28 oil is used similarly to TZ-19, but only when there is a risk of oil dilution with coolant, e.g. methyl chloride.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES		
		TZ-13	TZ-19	TZ-28
kinematic viscosity at 50°C	mm^2/s	14.8	21.8	30.4
flash point	°C	162	212	230
solidification point	°C	-50	-32	-30
ash residue	% (m/m)	0.003	0.004	0.003

FRIGOL M 68

GENERAL DESCRIPTION:
FRIGOL M 68 oils for refrigerating compressors are made based on selected mineral base oils. They are characterised by low pour point, good thermal stability and wear protection of working surfaces.

APPLICATIONS:
FRIGOL M oils are intended to lubricate all types of CFC refrigerating compressors operating with CFC coolants (e.g. R12), HCFC coolants (e.g. R22) and ammonia.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
ISO VG viscosity grade		68
kinematic viscosity at 40°C	mm^2/s	66.4
flash point	°C	200
pour point	°C	-34
corrosive action on cooper plates 100°C/3h	rating	1
acid number	mg KOH/g	<0.01

L-AN

VISCOSITY GRADE:
ISO VG: 10, 15, 22, 32, 46, 68, 100, 150
APPROVALS:
L-AN 46 – TOP POREBA
L-AN 68 – FUM POREBA

GENERAL DESCRIPTION:
L-AN machine oils are produced from selectively refined oil distillates sourced from petroleum processing. Due to their high solidification point, in winter L-AN machine oils should be used for lubrication of devices operating in heated areas.

APPLICATIONS:
L-AN machine oils are intended to lubricate light-duty and medium-duty machine elements and industrial equipment:
- rolling and slide bearings,
- guides,
- mechanical gears,
- spindles, etc. and auxiliary friction nodes. Some L-AN machine oils are also applied for other purposes, e.g. hydraulic systems filling.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES							
ISO VG viscosity grade		10	15	22	32	46	68	100	150
kinematic viscosity at 40°C	mm^2/s	10.2	15.2	22.4	33.6	43.9	69.3	98.9	148.2
viscosity index	-	98	97	97	96	94	94	93	90
pour point	°C	-10	-7	-7	-6	-6	-1	-1	-5
flash point	°C	152	172	205	208	232	240	251	260

L-AN Z

VISCOSITY GRADE:
ISO VG: 10, 15, 22, 32, 46, 68, 100
MEETS REQUIREMENTS:
PN-88/C-96071

GENERAL DESCRIPTION:
Low-solidifying L-AN Z machine oils are produced from refined oil distillates sourced from petroleum processing and additives reducing the solidification point.

APPLICATIONS:
Low-solidifying L-AN Z machine oils are intended for lubricating light and medium loaded machine elements and industrial devices:
- rolling and slide bearings,
- guides,
- mechanical gears,
- and supplementary friction centres which are exposed to low temperatures, i.e. operating in unheated areas in winter.

Some L-AN Z low-solidifying machine oils can also be used for other purposes, e.g. hydraulic systems.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES						
ISO VG viscosity grade		10	15	22	32	46	68	100
kinematic viscosity at 40°C	mm^2/s	9.7	14.8	22.7	32.6	45.0	67.1	101.6
viscosity index	-	97	97	96	96	95	94	94
pour point	°C	-34	-33	-32	-32	-24	-21	-20
flash point	°C	154	168	200	227	230	243	250

VELOL®

GENERAL DESCRIPTION:
VELOL® are low-solidification machine oils made from refined oil distillates. They contain additives which improve their lubricating properties and temperature-dependant viscosity, additives which improve resistance to foaming as well as corrosion and oxidation inhibitors. There are two types available: VELOL® 9Q and VELOL® 19.

APPLICATIONS:
VELOL® machine oils are applied for total loss lubrication and oil level lubrication of high-speed elements of textile machines, machine tools and other precise machine elements as defined in the device lubricating instructions.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES	
		VELOL® 9Q	VELOL® 19
kinematic viscosity at 20°C	mm^2/s	10.7	19.5
kinematic viscosity at 40°C	mm^2/s	5.98	10.8
viscosity index	–	–	90
solidification point	°C	-43	-35
flash point	°C	130	146

VELOL® RC

VISCOSITY GRADE:
ISO VG: 32, 68, 220
QUALITY CLASS:
DIN 51502 – CG class, ISO/T.R3498:1996 – cl. G,
APPROVALS:
VELOL® RC 32 – Cincinnati Milacron P-53,
VELOL® RC 68 – Cincinnati Milacron P-47, HACO GROUP, FUM PORĘBA, TOP PORĘBA, MAG
VELOL® RC 220 – Cincinnati Milacron P-50, CHOFUM - Machine tools

GENERAL DESCRIPTION:
VELOL® RC oils are made from deeply refined mineral oil and additive package to ensure the proper frictional characteristics, necessary to meet the requirements of the Cincinnati - Milacron P-50, P-53 and P-47. They enable to maintain hydrodynamic lubrication in the guide, determine the correct position of the tool with respect to the element, eliminate the phenomenon of "stick-slip", extend the working time of the systemic cutters and tools, achieve the proper surface processing effect and provide excellent separation from the processing oils.

APPLICATIONS:
VELOL® RC oils are used for lubrication of all types of slideways, in particular:
VELOL® RC 32 and **RC 68** oils – for lubricating of horizontal slide ways working at moderate temperatures and at moderate to medium loads.
VELOL® RC 220 oil – for the lubrication of vertical slide ways and precision guides working at increased temperatures and high loads.
They ensure proper operation of the guides with an emphasis on proper frictional characteristics and the elimination of the phenomenon of "stick-slip".

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES		
ISO VG viscosity grade		32	68	220
kinematic viscosity at 40°C	mm^2/s	31.4	69.5	227.0
viscosity index	–	98	97	97
pour point	°C	-18	-15	-15
flash point	°C	190	230	240

MN GREASED MACHINE OILS

MEETS REQUIREMENTS:
PN-56/C-96074

GENERAL DESCRIPTION:
MN greased machine oils are a mixture of mineral oils and oxidized vegetable oil. Depending on the composition, there are two types of greased machine oils available : MN-11 and MN-15.

APPLICATIONS:
Greased machine oils are applied for lubrication of the following:
- steam engine bearings of vessels,
- bearings exposed to contact with water with which greased machine oils form stable lubricating emulsions,
- bearings of machines exposed to high unit loads.

MN-11 greased machine oil is applied for lubrication of external parts of steam engines, and the MN-15 oil for lubrication of vessels propeller bearings.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES	
		MN-11	MN-15
kinematic viscosity at 50°C	mm^2/s	81.5	109.3
solidification point	°C	-8	-8
flash point	°C	218	240
saponification number	mg KOH/g	20	13

NP CIRCULATING OILS

APPROVALS:
Approved by the National Institute of Hygiene

GENERAL DESCRIPTION:
The NP circulating oils are made from specially selected base oils and higher fatty acids, and enriched with a set of additives.

APPLICATIONS:
The NP circulating oil is intended to lubricate low-temperature friction centres (up to 90 degrees); it is used in machining devices as a cooling and lubricating agent, in low-duty hydraulic systems requiring L–HH oils. It can also be used for cleaning of industrial installations.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES		
		32	68	100
kinematic viscosity at 40°C	mm^2/s	32	65	93
viscosity index	-	138	126	121
pour point	°C	-16	-22	-15
weld load	daN	200	200	200

CYLINDER OILS

MEETS REQUIREMENTS:
PN-61/C-96095

GENERAL DESCRIPTION:
Cylinder oils are made through conservative processing of petroleum. Due to their operation conditions (high temperatures, action of steam) and performance requirements (protection from ring and cylinder wear and sealing of operation spaces) the cylinder oils are characterised by high ignition temperature, high viscosity, high chemical stability, low susceptibility to coking in thermal decomposition, which results in producing hard residues on operating part of machines, high resistance to steam washing.

APPLICATIONS:
Cylinder oils are intended to lubricate cylinders, timing gear elements, steam engine glands, however:
CI-17/100-0-10 cylinder oil is applied for intake saturated steam temperature up to 250°C,
CI-30 cylinder oil is applied for operation of machines with intake overheated steam temperature up to 290°C,
CI-40/100-0-10 cylinder oil is applied for operation of machines with intake highly overheated steam temperature up to 310°C.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES		
		CI-17	CI-30	CI-40
kinematic viscosity at 40°C	mm^2/s	340	610	1000
kinematic viscosity at 100°C	mm^2/s	30.8	40.6	46.0
flash point	°C	285	304	310
solidification point	°C	-8	-10	-14
carbon residue	%	0.076	0.09	1.04

AXLE OILS

GENERAL DESCRIPTION:
Axle oils are made through processing of petroleum. Depending on kinematic viscosity and freezing temperature, there are two types of industrial (axial) oils available, marked as:
Pm-50/50-0-0 (former L-type axle oil)
Pm-30/50-0-020 (former U-type axle oil.

APPLICATIONS:
Industrial (axle) oils are mainly intended to lubricate slide bearings of steam locomotives as well as rail and tram cars.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES	
		Pm-50/50	Pm-30/50
kinematic viscosity at 50°C	mm^2/s	58.7	41.5
flash point	°C	180	170
solidification point	°C	-5	-28

SP WASHABLE OIL

GENERAL DESCRIPTION:
The SP washable oil is made from refined mineral base oils and an appropriate active surfactant additive.

APPLICATIONS:
The SP washable oil is intended for lubrication of ribbed discs and cylinder crown, together with needles and flat parts of crocheting machines.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 40°C	mm^2/s	24
solidification point	°C	-20
flash point	°C	225
carbon residue	% (m/m)	0.1

UNIDOM WHITE MACHINE OIL

GENERAL DESCRIPTION:
UNIDOM oil is made basing on high quality white oil. It contains no contaminants such as sulphur or polycyclic aromatics. Unidom is a lightweight, odourless and non-toxic oil of very good lubricating properties. It has a wide range of operating temperatures, excellent thermo-oxidant stability, low natural pour point and low evaporation.

APPLICATIONS:
UNIDOM is light machine oil of multiple household and automotive applications - lubricates and provides corrosion protection to parts exposed to elements. It is intended to lubricate light-duty and high-speed bearings in machines and precision mechanisms of sewing and textile machines, bicycles, locks, cables, padlocks, hinges, measuring equipment, various sports equipment and other low-duty sliding and rotary mechanisms.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 40°C kinematic viscosity at 100°C	mm^2/s	21.5 4.4
pour point	°C	-24
flash point	°C	215
density at 15°C	kg/l	0.831

MACHINE OILS

ORLEN OIL MP 150, 220

VISCOSITY GRADE:
ISO VG: 150, 220

GENERAL DESCRIPTION:
ORLEN OIL MP oils are made basing on high-refined mineral oil and properly selected set of enriching additives. They are characterised by an excellent ability to separate water and corrosion protection, high oxidation stability and good lubricating properties.

APPLICATIONS:
ORLEN OIL MP oils are top quality machine oils intended mainly for circulating lubrication systems in paper mills, for lubrication of rolling and slide bearings, gears, drive shafts etc. They can be also successfully used to lubricate operating parts of machinery and equipment operating in harsh conditions, e.g. heavy-duty operation, in presence of water.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES	
		MP 150	MP 220
kinematic viscosity at 40°C	mm^2/s	148	217
kinematic viscosity at 100°C	mm^2/s	14	18
viscosity index	-	90	90
pour point	°C	-25	-18
corrosion protection on Cu plates, 3h/120°C	-	1	1

LOCOMOTIVE OILS

LOKOMOTIV EXTRA CF 40

VISCOSITY GRADE:
SAE: 40
QUALITY CLASS:
API: CF

GENERAL DESCRIPTION:
LOKOMOTIV EXTRA CF SAE 40 is manufactured is basing on deeply refined mineral base oils and package of enriching additives which improve anti-wear, anti-corrosion, anti-oxidation properties and prevent deposits formation.

APPLICATIONS:
LOKOMOTIV EXTRA CF SAE 40 is an engine oil intended mainly to lubricate heavy-duty, diesel railway engines operating in difficult conditions. It can also be applied to lubrication of similar type of diesel engines working in other technical equipment.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 100°C	mm^2/s	14.5
viscosity index	-	100
flash point	°C	242
pour point	°C	-24
total base number	mgKOH/g	14

LOKOMOTIV PREMIUM CD 40

VISCOSITY GRADE:
SAE: 40
QUALITY CLASS:
API: CD

GENERAL DESCRIPTION:
LOKOMOTIV PREMIUM CD 40 is made basing on deeply refined mineral base oils and suitably selected package of enriching additives.

APPLICATIONS:
LOKOMOTIV PREMIUM CD 40 is used mainly in heavy-duty, diesel railway engines operating in thermally and mechanically difficult conditions.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 100°C	mm^2/s	14.7
viscosity index	-	103
flash point	°C	242
pour point	°C	-24
total base number	mgKOH/g	13

P-10, P-15, P-22, P-32, P-46, P-68, P-100 OILS

GENERAL DESCRIPTION:
P-10, P-15, P-22, P-32, P-... are made basing on deep refined mineral oils.

APPLICATIONS:
P-10, P-15, P-22, P-32, P-...oils are intended for use in rubber, chemical and plastic industries as a substance improving plastic and adhesive properties.

VISCOSITY GRADE:
ISO VG: 10, 15, 22, 32, 46, 68, 100

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES						
		10	**15**	**22**	**32**	**46**	**68**	**100**
kinematic viscosity at 40°C	mm^2/s	10.2	15.2	22.4	33.6	43.9	69.3	98.5
viscosity index	–	98	97	97	96	94	94	93
pour point	°C	-10	-7	-7	-6	-6	-5	-5
flash point	°C	152	172	205	208	232	240	252

OIL FOR VARIOUS APPLICATIONS H-1

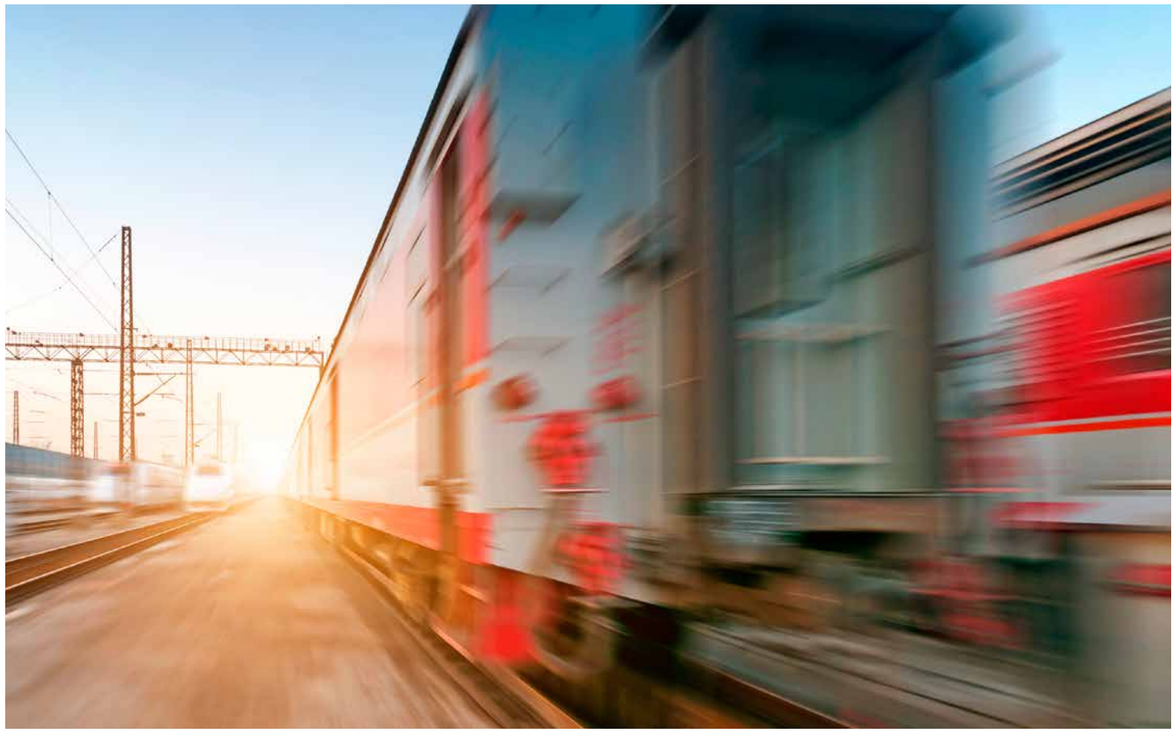
GENERAL DESCRIPTION:
H-1 multi purpose oil is made basing on refined, mineral oil base, a set of emulsifiers specific for non-flammable liquids and anti-corrosive additives.

APPLICATIONS:
The H-1 oil in the form of water emulsion is used:
- in mining industry, in powered roof supports and central or individually powered props, as HFAE non-flammable liquids,
- as a coolant in diesel locomotive engines.

Recommended emulsion concentration: from 2 to 10% with water hardness up to 10°N (e.g. for hydraulic liquids 2% solutions).

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
rust prevention 2% emulsion on steel 60°C/24h	-	pass
solidification point	°C	-16
flash point	°C	176
pH 2% emulsion	-	8.7



PILAROL EKO

GENERAL DESCRIPTION:
All-season environmentally friendly oil with perfect operating properties, for lubrication of chain saws, made with refined vegetable oil as the base and a special combination of enriching additives. The use of vegetable oil as a base places Pilarol-Eko among quality biodegradable oils – it scored 90% biodegradability rate in the CEC-L-33-T-82 test. Properly selected combination of enriching additives guarantees best performance: very good adherence to the device movable parts (saw cutting system), proper thermal characteristic which allows its application in a wide range of temperatures, anti-corrosive and friction wear protection qualities.

APPLICATIONS:
PILAROL EKO is a quality oil used for lubricating cutting system (chain) and mechanical saw guides used in forestry, horticulture, etc. It also may be used for lubrication of other machines used in felling trees.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 40°C	mm^2/s	63.1
viscosity index	–	182
flash point	°C	244
pour point	°C	-26

PILAROL (Z)

GENERAL DESCRIPTION:
All-season special oil with perfect operating properties for lubrication of chain saws, made with deep-refined mineral oil as the base and a special combination of enriching additives including: viscosity and depressing additive as well as the additive enhancing oil-metal adherence. Properly selected combination of enriching additives guarantees best performance: very good adherence to the device movable parts (saw cutting system), excellent lubricating properties also in low temperatures, proper thermal characteristics which allows its application in a wide range of temperatures, anti-corrosive and friction wear protection.

APPLICATIONS:
PILAROL (Z) is used for lubricating cutting systems (chain) and mechanical saw guides used in forestry, horticulture, etc. It also may be used for lubrication of other machines used in felling trees.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 40°C	mm^2/s	84.9
viscosity index	–	95
flash point	°C	238
pour point	°C	-31

ITERM 30 MF

GENERAL DESCRIPTION:
ITERM 30 MF oil is made basing on refined oil fraction with anti-oxidant, dispersion and anti-foaming additives.

APPLICATIONS:
ITERM 30 MF is used for lubricating machines and equipment operating in temperatures up to 200°C, e.g. conveyor chains in dryers.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 100°C	mm^2/s	38.2
solidification point	°C	-5
flash point	°C	264
carbon residue	% (m/m)	0.9

OIL FOR PNEUMATICS

PNEUMATIC VG 32, 100

VISCOSITY GRADE:
ISO VG: 32, 100

GENERAL DESCRIPTION:
PNEUMATIC VG 32, 100 oil for pneumatic equipment is made with high quality oil base and a set of specially selected enriching additives. PNEUMATIC VG 32, 100 have the following properties: good adhesion to materials, no impact on construction material (aluminium, steel, rubber and plastic gaskets), good resistance to aging (no clogging of moving parts within long use time).

APPLICATIONS:
PNEUMATIC VG 32, 100 is intended to lubricate pneumatic drives e.g. upholstery staplers, drills, wrenches, etc. which require lubrication of internal movable parts.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES	
kinematic viscosity at 40°C	mm^2/s	31.2	101
viscosity index	–	101	105
flash point	°C	184	240
pour point	°C	-18	-30

ELECTRICAL INSULATING OIL

ORLEN OIL TRAFO EN

MEETS REQUIREMENTS:
PN-EN 60296

GENERAL DESCRIPTION:
Non-inhibited transformer oil made of deeply refined, naphthenic type mineral oil.

APPLICATIONS:
The oil is intended for use in transformers, switching devices and similar electrical devices in which oil performs insulating and heat dissipation function.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 40°C	mm^2/s	10.0
pour point	°C	-57
flash point	°C	145
surface tension	nN/m	50
breakdown voltage	kV	62

TURBINE OILS

TURBINEX TG PREMIUM

VISCOSITY GRADE:
ISO VG: 32, 46
QUALITY CLASS:
ISO L-TSB, L-TGSB, L-TGF, L-TGSE
NORMS, APPROVALS, SPECIFICATIONS:
DIN 51515 p.1; DIN 51515 p.2,
ISO 8068,
Siemens 901304, Siemens 901305
MEETS REQUIREMENTS:
Alstom HTGD 90117, Skoda Power,
GEK 32568f, BS 489

GENERAL DESCRIPTION:
High quality turbine oils TURBINEX TG PREMIUM with superior thermooxidative stability are made with high quality hydrocracked base oils group III. Oils contain a carefully balanced innovative additives such as antioxidants, corrosion inhibitors, non-ferrous metals deactivators and extreme pressure additives. With the unique properties oils provide extended drain intervals, reduce downtime, maintenance costs and preservations of turbine systems, and reduce failures. Unique designed oils formulation also provides lubrication of combined cycle system turbines. They provide very good filterability even in systems contaminated with small amounts of water. Oils meet the requirements of the world's leading turbine manufacturers. Characterized by high air release properties, very high resistance to oxidation, high resistance to sludge and deposit formation, very good filterability, very good corrosion properties, very good antiwear properties, very good resistance to emulsification and foaming.

APPLICATIONS:
Turbine oils TURBINEX TG PREMIUM are used primarily for the lubrication and cooling of bearings of gas and steam turbines, gas-steam combined cycle turbines CCGT, also equipped with gears. Oils designed for turbine systems where are elevated work temperatures and pressures. They can also be used as hydraulic fluids in the turbine control systems and for lubricating marine turbochargers of main and auxiliary engines powered by exhaust gases. In machine circulating systems requiring turbine oils quality oils, such as turbochargers, turbine pumps.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES	
		32	46
kinematic viscosity at 40°C	mm^2/s	31.6	43.6
viscosity index	-	133	132
pour point	°C	-18	-12
demulsibility at 54°C	min	5	10
test RPVOT	min	> 2000	

TURBINEX TG 32, 46

VISCOSITY GRADE:
ISO VG: 32, 46
QUALITY CLASS:
ISO L-TSB, L-TGSB, L-TGF, L-TGSE
NORMS, APPROVALS, SPECIFICATIONS:
DIN 51515 part 1, DIN 51515 part 2, ISO 8068,
Siemens 901305, Siemens 901304
Alstom HTGD 90117 (VG 32)
Skoda Power
MEETS REQUIREMENTS:
GEK 32568f, BS 489

GENERAL DESCRIPTION:
The high quality turbine oil TG TURBINEX with higher thermo-oxidative stability is made from high-quality, selected, specially hydro-treated mineral base oils. It contains innovative optimally selected enriching additives such as antioxidants, corrosion inhibitors, non-ferrous metals passivators and EP (extreme pressure) additives. Thanks to the outstanding performance characteristics it provides extended change intervals, it reduces downtime, the cost of repair and maintenance of hydraulic systems, and limits the number of breakdowns. The oil has the approval of the world's leading turbine manufacturers. Characterized by good ability of air release, very high resistance to oxidation, high resistance to sludge and sediment formation, a very good filterability, very good anti-corrosion and anti-rust properties, very good antiwear properties, excellent resistance to emulsification and foaming.

APPLICATIONS:
The TG TURBINEX turbine oils are primarily used to lubricate and cool the bearings in gas and steam turbines, gas-steam combined cycle CCGT, also fitted with toothed gears. The oils have been designed for turbine systems where there is increased temperature and pressure. They can also be used as hydraulic fluids in the turbine control systems and for lubricating, among others, turbochargers in marine main and auxiliary engines, driven by exhaust gas. In the machine circulating systems requiring oils of quality turbine oils, such as turbochargers, turbine pumps.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES	
		32	46
kinematic viscosity at 40°C	mm^2/s	31.8	44.2
viscosity index	-	97	96
pour point	°C	-15	-12
demulsibility at 54°C	min	5	10
test RPVOT	min	> 750	> 750

TURBINEX TU 32, 46, 68

VISCOSITY GRADE:
ISO VG: 32, 46, 68
QUALITY CLASS:
ISO L-TSA, L-TGA, L-TSE, L-TGE
NORMS, APPROVALS, SPECIFICATIONS:
DIN 51515 part 1,
ISO 8068
Approvals VG 32, 46
Siemens 901304 (VG 32, 46)
Skoda Power (VG 32, 46)
Alstom HTGD 90117 (VG 32)

GENERAL DESCRIPTION:
The turbine oil TU TURBINEX is made from high-quality, selected, hydro-treated base oils. It contains innovative optimally selected enriching additives such as antioxidants, corrosion inhibitors, non-ferrous metals passivators and EP additives. Thanks to the outstanding performance characteristics it provides extended change intervals, it reduces downtime, the cost of repair and maintenance of hydraulic systems, and limits the number of breakdowns. It provides very good filterability even in systems contaminated with small amounts of water. The oil has the approval of the world's leading turbine manufacturers. Characterized by good ability of air release, very high resistance to oxidation, a very good filterability, very good anti-corrosion and anti-rust properties, very good antiwear properties, excellent resistance to emulsification and foaming.

APPLICATIONS:
The TU TURBINEX turbine oils are primarily used to lubricate and cool the bearings in gas and steam turbines, also fitted with toothed gears. The oils can be used in normally used gas turbines under normal operating conditions. They can also be used as hydraulic fluids in the turbine control systems and for lubricating, among others, turbochargers in marine main and auxiliary engines, driven by exhaust gas. In the machine circulating systems requiring oils of quality turbine oils, such as turbochargers, turbine pumps.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES		
		32	**46**	**68**
kinematic viscosity at 40°C	mm^2/s	32,6	44.6	65.3
viscosity index	-	96	96	95
pour point	°C	-14	-11	-9
demulsibility at 54°C	min	5	10	15

TURBINEX BIO

GENERAL DESCRIPTION:
TURBINEX BIO VG 46 is designed especially for use in hydro power stations. The production technology has been developed with superior quality synthetic ester base and a set of additives to improve, among others, resistance to oxidation, load transmission performance and hydrolytic stability. Special formula of the oil reduces wear in friction points and ensures anti-corrosive protection of surfaces in contact with oil. Furthermore, the oil is characterised by high viscosity index which reduces viscosity changes depending on temperature, and ensures low evaporative potential, resulting in reduced loss of oil due to evaporation.

APPLICATIONS:
TURBINEX BIO VG 46 is intended to lubricate: turbine and generator bearings, including the lateral bearings, diverter vane bearings, valves, control system installations, i.e. it ensures trouble-free operation of hydraulic controls and systems feeding oil to friction points.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 40°C	mm^2/s	47
kinematic viscosity at 100°C	mm^2/s	8.2
pour point	°C	-60
flash point (c.c.)	°C	243
flash point (o.c.)	°C	278
resistance to oxidation – RBOT	minimum	860
ability to transfer loads at the FZG A/8.3/90, pass	-	10

TURBINE OILS

TU TURBINE OILS

VISCOSITY GRADE:
ISO VG: 32, 46, 68
MEETS REQUIREMENTS:
PN-84/C-96059, ISO/DIS 8068
DIN 51 515

GENERAL DESCRIPTION:
TU turbine oils are made through processing of petroleum, they are selectively refined and contain anti-oxidation and anti-corrosive additives. They are characterised by high resistance to oxidation, very good anti-corrosive and anti-rust properties, good resistance to emulsifying and high ability to release air.

APPLICATIONS:
TU turbine oils are first of all intended for lubrication and cooling of steam, gas and water turbine bearings. They also may be applied as hydraulic fluids in turbine control systems and for lubrication of turbochargers of main or auxiliary vessel engines driven with exhaust gases, in circulating systems of machines requiring turbine oil quality, e.g. in turbo compressors, turbine pumps.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES		
		32	**46**	**68**
kinematic viscosity at 40°C	mm^2/s	31.5	42.0	72.4
viscosity index	-	99	96	94
pour point	°C	-15	-13	-13
flash point	°C	220	230	242
ash residue	% (m/m)	0.004	0.004	0.004

T-20, T-30 TURBINE OIL

MEETS REQUIREMENTS:
ZN-66/MPCh/NF-104

GENERAL DESCRIPTION:
T-20- and T-30 turbine oils are made through conservative processing of petroleum. They are characterised by good resistance to emulsifying and oxidation.

APPLICATIONS:
T-20 and T-30 turbine oils are mainly applied for:
- circulating lubrication of steam turbine bearings,
- lubrication of turbine sets with toothed gears, in case of a common oil circuit,
- lubrication of water turbines.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES	
		T-20	**T-30**
kinematic viscosity at 50°C	mm^2/s	22.4	32.0
solidification point	°C	-15	-14
flash point	°C	228	235
ash residue	% (m/m)	0.002	0.003

EMULSIFYING OILS FOR MACHINING

AQUASYN HD

STANDARDS, SPECIFICATIONS:
Approved by the National Institute of Hygiene

GENERAL DESCRIPTION:
AQUASYN HD is a synthetic emulsifying concentrate for multipurpose application in machining of metals or grinding.

APPLICATIONS:
AQUASYN concentrates are intended for use in the operations of moderate machining and grinding of ferrous and non-ferrous metals. They are designed for machining steel, cast iron, non-ferrous metals and their alloys.

PHYSICAL AND CHEMICAL PROPERTIES:

	PARAMETERS	UNITS	TYPICAL VALUES
CONCENTRATE	appearance	-	homogeneous, clear brown liquid
	kinematic viscosity at 20°C	mm^2/s	5.0
	kinematic viscosity at 40°C	mm^2/s	2.6
3% SOLUTION IN WATER HARDNESS 15°N	appearance	-	colourless, transparent liquid
	pH	-	9.5
	emulsion stability in time 24h/20°C	-	pass
	rust protection: • Herbert test • Ford test	-	 H0 F0
	refractive index at 20°C	-	2.8

UNICOOL MIKRO EP

STANDARDS, SPECIFICATIONS:
Certified by the National Hygienic Institute.
Recommended operating concentrations:
- grinding – 3÷5%,
- normal machining – 3÷5%,
- heavy-duty machining – 5÷8%.

APPROVALS:
HACO GROUP

GENERAL DESCRIPTION:
UNICOOL MIKRO EP is a semi-synthetic emulsifying concentrate with EP content and universal application in machining of various metals.

APPLICATIONS:
UNICOOL MIKRO EP is intended primarily for use in heavy-duty machining processes and grinding of steel, cast-iron, non-ferrous metals or for machining of very hard materials e.g. alloy steels, nimonic. It may also be used for machining aluminium alloys. High load resistance of emulsion film, strengthened by EP additives, allows excellent performance in heavy-duty machining. Good emulsion dispersion and its moistening properties allow easy reduction of friction and removal of heat from the machining area, providing cleanness in the working environment.

PHYSICAL AND CHEMICAL PROPERTIES:

	PARAMETERS	UNITS	TYPICAL VALUES
CONCENTRATE	appearance	-	homogeneous, clear brown to yellow liquid
	mineral oil content	%	approximately 35
	kinematic viscosity at 40°C	mm^2/s	65.0
	lubricating properties on a four ball pressure tester, weld load	kG	160
3% SOLUTION IN WATER HARDNESS 15°N	appearance	-	transparent to opalescent fluid
	pH	-	9.2
	emulsion stability in time 24h/20°C	-	pass
	rust protection - Herbert test	-	H0
	lubricating properties on a four ball pressure tester, weld load • 3% emulsion • 5% emulsion	kG	 126 126
	refractive index at 20°C	-	1.41

UNICOOL MIKRO

STANDARDS, SPECIFICATIONS:
Certified by the National Hygienic Institute.
Recommended operating concentrations:
- grinding – 3÷5%,
- normal machining –3÷5%,
- heavy-duty machining –5÷8%.

APPROVALS:
HACO GROUP

GENERAL DESCRIPTION:
UNICOOL MIKRO is a semi-synthetic emulsifying concentrate for multipurpose application in machining of metals. It is resistant to bacteria and fungi.

APPLICATIONS:
UNICOOL MIKRO is intended for use in medium-duty and heavy-duty operations, for machining and grinding most ferrous metals (steel, alloy steel, cast iron). High load resistance of emulsion film, strengthened by EP additives, allows satisfactory performance in heavy-duty machining. Good emulsion dispersion and its moistening properties allow easy reduction of friction and removal of heat from the machining area, providing cleanness in the working environment. Grinding with UNICOOL MIKRO allows keeping the grinding wheel clean (protection from polishing) and extends its life.

PHYSICAL AND CHEMICAL PROPERTIES:

	PARAMETERS	UNITS	TYPICAL VALUES
CONCENTRATE	appearance	-	homogeneous, clear brown to yellow liquid
	mineral oil content	%	approximately 30
	kinematic viscosity at 40°C	mm^2/s	55.0
3% SOLUTION IN WATER HARDNESS 15°N	appearance	-	transparent to opalescent fluid
	pH	-	9.1
	emulsion stability in time 24h/20°C	-	pass
	rust protection: Herbert test	-	H0
	lubricating properties on a four ball pressure tester: • 3% emulsion • 5% emulsion	kG	100 126
	refractometric index at 20°C	-	1.42

UNICOOL MIKRO E

STANDARDS, SPECIFICATIONS:
Certified by the National Hygienic Institute.

Recommended working concentration:

machining	light	medium-duty
normal machining (turning, milling)	3%	5-6%
grinding	1.5-2%	3-5 %
heavy chip machining (threading, drilling deep holes)	3-4%	6-8%
stamping, moulding	3-4 %	5-6%
drilling	4-5%	8-10%

GENERAL DESCRIPTION:
UNICOOL MICRO E - is a semi-sythetic coolant forming microemulsions with water. It does not contain any harmful substances.

APPLICATIONS:
UNICOOL MIKRO E - has been designed for use in conventional machining processes such as turning and milling, in the process of drilling, reaming, deep hole drilling as well as drilling, grinding and polishing. It is suitable for low and high pressure systems, CNC. It can be used in the central systems as well as individually working machinery. Compatibility with the workpiece material: cast iron, iron alloys and stainless steel, aluminium alloys, plastic materials.

PHYSICAL AND CHEMICAL PROPERTIES:

	PARAMETERS	UNITS	TYPICAL VALUES
CONCEN-TRATE	density at 20°C	%	1.01
	kinematic viscosity at 40°C	mm^2/s	1.002
5% SOLUTION IN WATER HARDNESS15°N	appearance at 20°C	-	transparent to opalescent fluid
	pH	-	9.3
	emulsion stability in time 24h/50°C	-	1A/1R/pass
	rust protection: Herbert test	-	H0

UNICOOL WO

APPROVALS:
Certified by the National Hygienic Institute
Recommended operating concentrations:
- grinding – 3÷4%,
- normal machining - 4÷8%,
- heavy-duty machining - 8÷10%.

GENERAL DESCRIPTION:
UNICOOL WO is a concentrated high-oil coolant, which makes stable, milky emulsions with water. It is produced with mineral oil base and a set of additives to improve, among others, lubricating, anti-corrosive and anti-foaming properties of ready product.

APPLICATIONS:
UNICOOL WO in the form of water cooling and lubricating emulsion is used for various machining operations on steel, cast iron, non-ferrous metals and their alloys.

PHYSICAL AND CHEMICAL PROPERTIES:

	PARAMETERS	UNITS	TYPICAL VALUES
CONCENTRATE	appearance at temp. 20±5°C	-	homogeneous, clear light brown liquid
	mineral oil content	%	approximately 69
	kinematic viscosity at 40°C	mm^2/s	29.0
5% SOLUTION IN WATER HARDNESS 15°N	appearance at 20±5°C	-	milky emulsion
	pH	-	9.2
	emulsion stability in time 24h/20°C	-	pass
	rust protection: Herbert test	-	H0
	resistance to water at 25/95/25°C after a test at 50°C • 3% emulsion • 5% emulsion	cm^3	0/00/00/0 0/00/00/0
	refractive index at 20°C	-	1.47

MIKROCUT

STANDARDS, SPECIFICATIONS:
Recommended working concentrations:
- grinding – 3÷4%,
- normal machining – 3÷5%,
- heavy-duty machining – 5÷8%.

APPROVALS:
HACO GROUP

GENERAL DESCRIPTION:
MIKROCUT is a semi-synthetic oil concentrate including mineral oil, emulsifiers, corrosion inhibitors and water condensate. It easily mixes with water producing biostable, at least 3% (v/v) micro-emulsions with pH of 9.1 – 9.3 offering extended lifetime, very good anti-corrosive properties and low susceptibility to foaming.

APPLICATIONS:
MIKROCUT oil concentrate in the form of water cooling and lubricating micro emulsion is applied in machining (turning, milling, drilling, grinding) of steel, alloy steel and grey cast iron.

PHYSICAL AND CHEMICAL PROPERTIES:

	PARAMETERS	UNITS	TYPICAL VALUES
CONCENTRATE	appearance	-	homogeneous, clear brown to light brown liquid
	kinematic viscosity at 40°C	mm^2/s	42
	solidification point	°C	-7
3% SOLUTION IN WATER HARDNESS 15°N	corrosive action on alloys Herbert test	-	H0 R0
	pH	-	9.2
	emulsion stability in time 24h/20°C	visual	pass

EMULSIFYING OILS FOR MACHINING

EMULGOL ES-12

APPROVALS:
Certified by the National Hygienic Institute
Certified by the National Hygienic Institute
Recommended operating concentrations:
- grinding – 3÷5%,
- turning, milling, drilling, reaming – 5÷10%,
- threading – 10÷15%

GENERAL DESCRIPTION:
EMULGOL ES-12 machining oil is produced of highly refined mineral oil, ionic and non-ionic emulsifiers, corrosion inhibitors and enriching additives. Emulgol ES-12 contains no nitrites, chlorine, heavy metals and phenols.

APPLICATIONS:
EMULGOL ES-12 emulsifying oil in the form of water based cooling and lubricating emulsion is applied in machining of steel, cast iron and non-ferrous metals and their alloys.

PHYSICAL AND CHEMICAL PROPERTIES:

	PARAMETERS	UNITS	TYPICAL VALUES
CONCENTRATE	appearance at temp. 20±5°C	-	homogeneous, clear light brown liquid
	pour point	°C	-12
	kinematic viscosity at 40°C	mm^2/s	30.5
5% SOLUTION IN WATER HARDNESS 15°N	appearance at 20±5°C	-	milky emulsion
	pH	-	9.1
	emulsion stability in time 24h/20°C	-	pass
	rust protection: Herbert test	-	H0
	refractive index at 20°C	-	1.44

EMULGOL DS 30

APPROVALS:
Certified by the National Hygienic Institute
Recommended operating concentrations:
- grinding – 3÷5%,
- turning, milling, drilling, reaming – 5÷10%,
- threading – 10÷15%.

GENERAL DESCRIPTION:
EMULGOL DS 30 emulsifying oil is made of highly refined mineral oil, non-ionic emulsifiers, anionic emulsifiers and corrosion inhibitors. Concentrated EMULGOL DS 30 contains no nitrites, chlorine, heavy metals and phenols. EMULGOL DS 30 emulsion should be prepared using water hardness up to 15°N.

APPLICATIONS:
EMULGOL DS 30 emulsifying oil in the form of water based cooling and lubricating emulsion is applied in machining of steel, cast iron and non-ferrous metals.

PHYSICAL AND CHEMICAL PROPERTIES:

	PARAMETERS	UNITS	TYPICAL VALUES
CONCENTRATE	appearance at temp. 20±5°C	-	homogeneous, clear light brown liquid
	pour point	°C	-15
	kinematic viscosity at 40°C	mm^2/s	28.5
5% SOLUTION IN WATER HARDNESS 15°N	appearance at 20±5°C	-	milky emulsion
	pH	-	9.2
	emulsion stability in time 24h/20°C	-	pass
	rust protection: Herbert test	-	H0
	refractive index at 20°C	-	1.45

NON-EMULSIFYING OILS FOR MACHINING

FREZOL HC 800

VISCOSITY GRADE:
ISO VG: 22
APPROVALS:
The oil received positive "Toxicity and harmfulness assessment" issued by the Medical University of Silesia in Zabrze.

GENERAL DESCRIPTION:
FREZOL HC 800 is a new generation non-emulsifying oil for metal machining. It is made with hydrocracked mineral oil and a properly selected pack of chlorine-free enriching additives.

APPLICATIONS:
FREZOL HC 800, as a ready to use cutting oil, is used for heavy-duty machining processes, among others milling (also toothed gears), turning, threading, reaming, drawing, chiselling and in machining processes requiring coolant with durable lubricant film and good anti-wear properties.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 40°C	mm^2/s	22.8
pour point	°C	-21
flash point	°C	172
weld load	kG	620

FREZOL EPX

VISCOSITY GRADE:
ISO VG: 32, 46

GENERAL DESCRIPTION:
FREZOL EPX oils available in two viscosity degrees ISO VG: 32 and 46, are modern products for heavy-duty machining, developed with prime quality base mineral oils and enriching additives improving the anti-corrosive, anti-oxidation and anti-wear properties (EP additives) of the ready to use oil. FREZOL EPX contains no chlorine, phosphorus or heavy metal compounds.

APPLICATIONS:
FREZOL EPX oils, as ready to use cutting oil, are used for: turning, drawing, milling, chiselling, threading, reaming, cutting, in machining processes requiring coolant with durable lubricant film. They are recommended especially for working tough stainless and acid resistant steel grades.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES	
		32	**46**
kinematic viscosity at 40°C	mm^2/s	31.5	44.5
pour point	°C	-12	-12
flash point	°C	230	240
weld load	kG	500	500

FREZOL 22, 32

VISCOSITY GRADE:
ISO VG: 22, 32

GENERAL DESCRIPTION:
FREZOL 22, 32 oils are non-emulsifying oils for metal machining. They are obtained on the basis of the mineral oil and a properly selected pack of additives and corrosion inhibitors.

APPLICATIONS:
FREZOL oil as a ready cutting oil is intended to use in light to medium operations of metal machining, including milling of toothed gears, turning, threading. Frezol 22, 32 oils are dedicated to the processing of copper and its alloys, they are also suitable for the processing of ferrous and non-ferrous metals.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES	
		22	32
kinematic viscosity at 40°C	mm^2/s	22	46
anti-corrosive properties Cu 100°C/3h	-	1	1
weld load	kG	200	200

GRIND HC 315

VISCOSITY GRADE:
ISO VG: 10
APPROVALS:
The oil received positive "Toxicity and harmfulness assessment" issued by the Medical University of Silesia in Zabrze.

GENERAL DESCRIPTION:
GRIND HC 315 is a new generation non-emulsifying oil for grinding. It is made with hydrocracked mineral oil and a properly selected pack of chlorine-free enriching additives. The oil does not form oil mist, has high resistance to foaming, increases the life of a grinding wheel and contains no chlorine compounds.

APPLICATIONS:
GRIND HC 315 as a ready to use cutting oil is suitable for high-speed grinding operations and shape grinding of components of heat treated alloy steels, e.g. cogwheels, sprockets.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 40°C	mm^2/s	11.1
pour point	°C	-30
flash point (o.c.)	°C	184
weld load	kG	500
foaming resistance: • sequence I • sequence II • sequence III	cm^3	 20/0 40/0 20/0

SULFOFREZOL

APPROVALS:
The oils has been positively tested by the Institute of Metal Cutting in Krakow.

GENERAL DESCRIPTION:
SULFOFREZOL machining oil is made with mineral oils with an addition of fuel conditioner and sulphurised mineral oils.

APPLICATIONS:
SULFOFREZOL sulphurised oil is utilised as a ready to use cutting oil for high-speed machining of steel and cast iron, at high temperatures of cutting blade, and for machining of hard wearing and heat resistant steels. SULFOREZOL is not recommended for working non-ferrous metals and where high smoothness of the worked material is required. The application period depends on mechanical contamination and sulphur content which should not be lower than 0.4 % (m/m).

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 40°C	mm^2/s	22
kinematic viscosity at 50°C	mm^2/s	15.7
solidification point	°C	-16
flash point	°C	162
active sulphur content	% (m/m)	0.4

ACP-E

STANDARDS, SPECIFICATIONS:
Certified by the National Hygienic Institute

GENERAL DESCRIPTION:
ACP-1E, 2E, 3E non-emulsifying machining oils have been developed in response to environmental concerns. Those oils contain no chlorine compounds.

APPLICATIONS:
ACP-1E, 2E, 3E non-emulsifying machining oils are intended primarily for machining of steel, cast iron, copper and aluminium alloys at high unit pressures and high machining speed. The choice of oil depends on the type of working:
ACP-1E is used for contour of steel, cast iron, copper and aluminium alloys, for machining teeth by chiselling, for reaming and cutting threads,
ACP-2E is used for circumferential milling, reaming of steel, cutting threads, rolling, chipping, drawing and pressing,
ACP-3E is used for deep drilling and automatic machining.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES		
		ACP-1E	ACP-2E	ACP-3E
kinematic viscosity at 20°C	mm^2/s	36	48	52
solidification point	°C	-18	-15	-12
flash point	°C	148	153	159
corrosion on copper and steel, 100°C/3h, rating	rating	pass	pass	pass

SM MACHINING OIL

GENERAL DESCRIPTION:
Metal machining SM oil is made of mineral oils, fat derivatives increasing oil lubricating properties and anti-corrosive additives, as well as additives improving foaming inhibiting properties.

APPLICATIONS:
SM greased oil is applied as a ready to use cutting oil in machining of alloys of: iron, non ferrous metals, at low machining speed and cutting tool temperature up to 120°C. The SM oil can also be used for pull broaching and threading of non-ferrous metals and their alloys.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 50°C	mm^2/s	12.8
solidification point	°C	-6
flash point	°C	180
corrosive action on copper plates 100°C/3h	-	pass

HONOL D, BQ

GENERAL DESCRIPTION:
HONOL D and BQ oils are made of deeply refined mineral oil with anti-corrosive and anti-foaming additives, and those improving lubricating properties.

APPLICATIONS:
HONOL BQ oil is used for smoothening and honing steel and cast iron parts, especially on SM-581 Supfina honing machines.
HONOL D oil is used for smoothening and honing parts of steel, cast iron and non-ferrous metals. It allows to achieve high smoothness of honed surfaces.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES	
		D	BQ
kinematic viscosity at 20°C	mm^2/s	9	20
kinematic viscosity at 40°C	mm^2/s	4.93	-
pour point	°C	-10	-3
flash point open cup	°C	120	135
weld load	kG	300	240

NON-EMULSIFYING OILS FOR MACHINING

ORLEN OIL EDR 3

GENERAL DESCRIPTION:
ORLEN OIL EDR 3 electro-erosion machine oil is a dielectric fluid obtained through petroleum processing. In addition to very low volatility (resulting from narrow distilling range), this oil has a number of features, such as good resistance to oxidation and low sulphur content.

APPLICATIONS:
ORLEN OIL EDR 3 is suitable for electro-erosion processing of elements of complex geometry, made of materials which are both easy and hard to process, e.g. drop forging dies, injection moulds, permanent moulds, casting moulds, blanking dies, stamps, etc.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 40°C	mm^2/s	2.7
kinematic viscosity at 20°C	mm^2/s	4.4
pour point	°C	-31
flash point	°C	104
sulphur content	%	<0.01
distillation temperature range	°C	232-277

OILS FOR HARDENING

HARTEX 70S, 70, 120, 160

Recommended temperatures of oil bath:
- HARTEX 70S, 70: 40-80°C,
- HARTEX 120: 110-130°C,
- HARTEX 160: 160-180°C.

GENERAL DESCRIPTION:
HARTEX oils are made of highly refined petroleum oil bases and a set of additives facilitating oil cooling and protecting from formation of deposits on quenched cast-iron and steel elements. HARTEX 70 oils offer very high durability and stability of parameters in longer periods, sustaining appropriate heat load. According to the in-field experience, the oil can be used for up to 10 years in systems where optimum cooling is provided and the work piece size is kept optimum.

APPLICATIONS:
HARTEX hardening oils are intended for heat treatment of cast iron and steel, especially in closed, atmosphere controlled furnaces for which high surface cleanness of hardened material is required. HARTEX oils are also suitable for two-way tubes.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES			
		HARTEX 70S	HARTEX 70	HARTEX 120	HARTEX 160
kinematic viscosity at 40°C	mm^2/s	24	20.1	48.5	226
pour point	°C	-	-18	-15	-12
flash point, open cup/closed cup	°C	195/180	208/190	230/215	248/230
acid number	mg KOH/g	-	0,06	-	-
max. hardening speed	-	100	96	89	80

OH-70, OH-120M, OH-160M

GENERAL DESCRIPTION:
OH-70 hardening oil and OH-120M and OH-160M oils are made of refined mineral oils and a set of additives: anti-oxidation, surface active, increasing the cooling rate, inhibiting formation of residue on the treated surface.

APPLICATIONS:
Hardening oils are intended for heat treatment of cast iron and steel, for which minor geometrical deformations are acceptable and proper cooling rate is required.
Recommended temperatures of oil bath:
- OH-70: 40-80°C,
- OH-120M: 110-130°C,
- OH-160M: 160-180°C.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES		
		OH-70	OH-120M	OH-160M
kinematic viscosity at 40°C	mm^2/s	22.1	47.3	228
pour point	°C	-10	-10	-7
flash point, open cup/closed cup	°C	170/150	215/196	268/246
carbon residue	% (m/m)	0.15	0.40	0.48

OILS FOR PLASTIC WORKING

PRESSOL PT

GENERAL DESCRIPTION:
PRESSOL PT is a fast evaporating fluid for easy and moderate stamping of steel sheets. It is made of light oil fractions and adequately selected enriching additives. It is characterised by perfect evaporating power – average evaporating time from the sheet surface is ca. 40 minutes (depending on ambient temperature and humidity), very good moistening and penetration properties providing suitable surface covering, very good lubricating properties – applied additives protect from paint damages due to stamping, no discolouring of the paint.

APPLICATIONS:
PRESSOL PT is mainly recommended for application in stamping lacquered roofing steel sheets. The processed sheet surface does not require degreasing or applying of other cleaning processes. It may also be used in other branches of industry for stamping thin sheets and lacquered or zinc coated steel items, in all these applications where very high cleanness of the processed surface is necessary. PRESSOL PT may be applied on the sheet surface with a brush, roller or by spraying.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 20°C	mm^2/s	1.22
kinematic viscosity at 40°C	mm^2/s	1.16
flash point in crucible: • open • closed	°C	 46 43
rust prevention, 24h/60°C	-	pass

PRESSOL B

GENERAL DESCRIPTION:
PRESSOL B is a stamping and lubricating oil made of quality mineral oil base. It contains enriching additives to increase the durability of lubricating film, which naturally protects tools from premature wear, adhesion and anti-corrosive agents, and substances enhancing component cleaning after stamping.

APPLICATIONS:
PRESSOL B is dedicated for precision stamping and rolling. PRESSOL B ensures: reduced tooling wear and increased life, reduction of friction, anti-corrosive protection, excellent moisturising of worked material and tools, delivering products of the desired size and surface.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 20°C	mm^2/s	180
kinematic viscosity at 50°C	mm^2/s	43
corrosion on cooper	-	1
weld load	kG	800

OP-35

GENERAL DESCRIPTION:
OP-35 oil for plastic working is made of sulphured mineral oil and anti-oxidation and anti-corrosive additives as well as additives improving lubricating properties.

APPLICATIONS:
OP-35 is used as a cutting oil in cold forging.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 50°C	mm^2/s	56
flash point	°C	184
saponification number	mg KOH/g	10.0
weld load	daN	400

L STAMPING OIL

GENERAL DESCRIPTION:
L stamping oil is made of mineral base oil. It contains enriching additives increasing the strength of the lubricating film, additives improving adhesion and additives facilitating cleaning of the elements following stamping.

APPLICATIONS:
L stamping oil is used for stamping parts of complex geometry and for blanking.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 50°C	mm^2/s	43
saponification number	mg KOH/g	96
weld load	daN	315

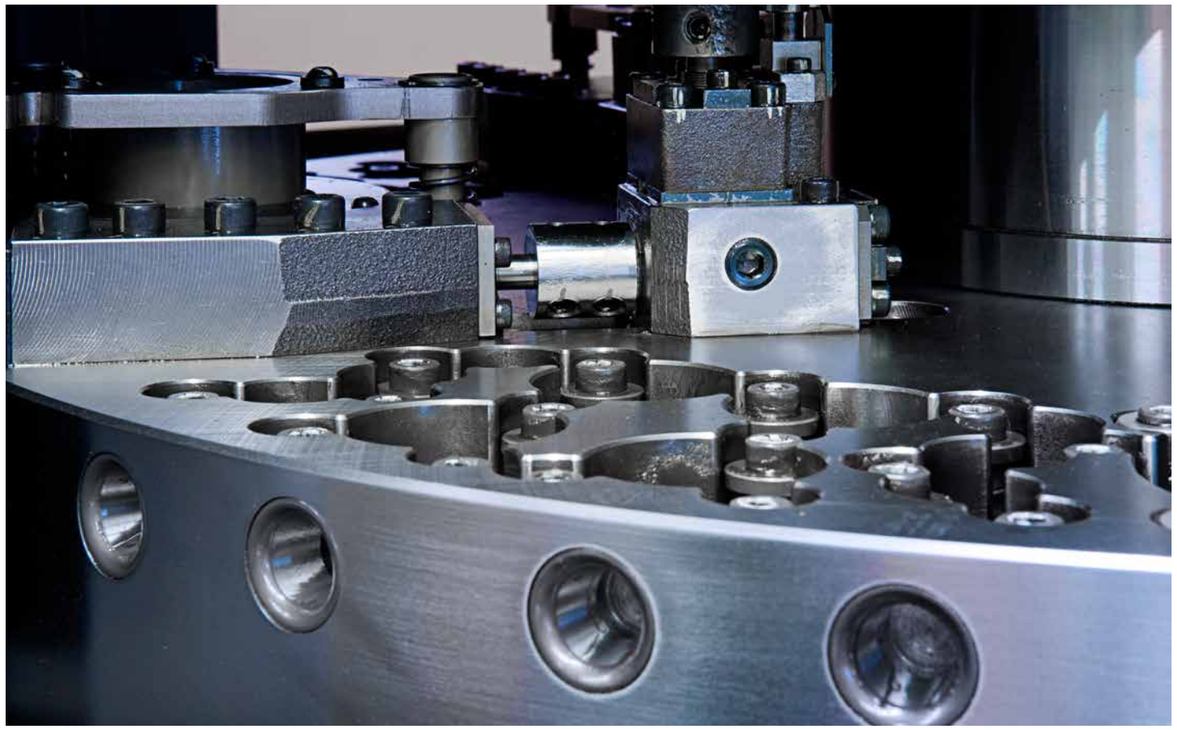
OIL FOR VERY DEEP STAMPING

GENERAL DESCRIPTION:
The oil for very deep stamping is made of deeply refined mineral base oil. The base oils are enriched with substances improving lubricating properties, reducing solidification temperature and significantly reducing oil foaming.

APPLICATIONS:
Oil for very deep stamping is used for stamping items of complex geometry and sharp curvatures, which require very high pressure, e.g. in stamping of baths and sinks of highly alloyed and stainless, cold rolled steel sheets.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 40°C	mm^2/s	330
kinematic viscosity at 50°C	mm^2/s	143
solidification point	°C	-29
flash point	°C	238
weld load	daN	500



KONKRETON L (Z)

GENERAL DESCRIPTION:
KONKRETON L(Z) anti-adhesive oil is made of deep refined mineral oil and enriching additives, improving the anti-adhesive and anti-corrosive properties. Carefully designed oil formula, based on adequate proportion of components allowing adequate freeing of concrete from the mould, adds to production economy and environmental protection.

APPLICATIONS:
KONKRETON L(Z) anti-adhesive oil is intended for lubricating moulds in manufacturing of concrete elements and cellular concrete blocks, where the mould is lubricated with cold spraying method.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 40°C	mm^2/s	24.0
pour point	°C	-6
flash point, open cup/closed cup	°C	175

KONKRETON LA (Z)

GENERAL DESCRIPTION:
Anti-adhesive oil KONKRETON LA (Z) is produced on the base of selectively and deeply refined mineral oil and refining additives which enhance anti-adhesive capabilities and prevent corrosion. The appropriately designed formula of the oil, based on well-balanced ingredients which determine the suitable mechanism of releasing concrete from a form, guaranties improving the economy of production and has a positive impact on environment protection.

APPLICATIONS:
Anti-adhesive oil KONKRETON LA (Z) is intended for lubricating forms used in production of precast concrete elements as well as cellular concrete blocks in which a form is lubricated using the cold spraying method. The oil KONKRETON LA (Z) is perfect for lubrication of wooden and metal formwork used in civil engineering and construction.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 40°C	mm^2/s	17.5
pour point	°C	-6
flash point, open cup/closed cup	°C	160

KONKRETON V, VS, L, N, NH, P, S, XS, VS

KONKRETON N, P:
Certified by the National Hygienic Institute

GENERAL DESCRIPTION:
KONKRETON anti-adhesive oil is made of deep refined mineral oil and enriching additives, improving the anti-adhesiveand anti-corrosive properties.

APPLICATIONS:
KONKRETON anti-adhesive oils are intended to lubrication of forms (moulds) used in the production of concrete elements and blocks of lightweight cellular concrete:
KONKRETON V, VS are intended to lubricate cold and plastic forms by spraying both in the production of concrete and precise cellular concrete blocks,
KONKRETON L and **N** are used for lubrication of the cold forms by spraying,
KONKRETON NH intended for lubrication of the warm forms by spraying,
KONKRETON P is intended for manual lubrication of forms with a brush and a roller,
KONKRETON VS is designed to lubricate forms by spraying in the production of aerated autoclaved concrete,
KONKRETON XS is applied for lubrication of forms used for the production of cellular concrete or other concrete elements, which require increased thickness of the separating layer.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES							
		KONKRETON V	KONKRETON VS	KONKRETON L	KONKRETON N	KONKRETON NH	KONKRETON P	KONKRETON S	KONKRETON XS
kinematic viscosity at 40°C	mm^2/s	5.5	6.0	20.0	40.0	60.5	79.0	100	152
pour point	°C	-	-6	-6	-6	-5	-5	-5	-8
flash point, open cup/closed cup	°C	125	86	175	190	195	210	215	215
saponification number	mg KOH/g	3.5	5.5	3.5	3.8	3.8	3.9	3.9	5.8

FORMEX Q

GENERAL DESCRIPTION:
FORMEX Q oil is made of deeply refined mineral oils with an additive inhibiting concrete adhesion to moulds and corrosion inhibitors.

APPLICATIONS:
FORMEX Q is intended to lubricate steel moulds in manufacturing of concrete and ferroconcrete precast units, and for steel and wooden shuttering in civil engineering.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 20°C	mm^2/s	24
saponification number	mg KOH/g	7.3
flash point	°C	92
solidification point	°C	-12

B-0 ANTI-ADHESION OIL

GENERAL DESCRIPTION:
B-0 anti-adhesion oil is made of deeply refined mineral oil and olein acid.

APPLICATIONS:
B-0 anti-adhesion oil is used for lubrication of large area steel moulds and for high unit pressures.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 40°C	mm^2/s	18
solidification point	°C	-8
flash point	°C	178

BQ OIL FOR CERAMICS

GENERAL DESCRIPTION:
BQ anti-adhesion oil for ceramics is made of light petroleum distillates (fractions) and vegetable or animal fat acids.

APPLICATIONS:
BQ anti-adhesion oil for ceramics is used in ceramic industry. It is used for manufacturing of stoneware and semi-vitreous products and for manufacturing of electro-technical porcelain as an ingredient of kaolin mix. It can also be used for lubrication of moulds in production of concrete parts.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 20°C	mm^2/s	4.6
kinematic viscosity at 40°C	mm^2/s	3
flash point	°C	69
saponification number	mg KOH/g	8.1
acid number	mg KOH/g	7.3

CERAMOL Q

GENERAL DESCRIPTION:
CERAMOL Q oil is made of light mineral oil distillates and typical anti-adhesive additives.

APPLICATIONS:
CERAMOL Q is used for manufacturing of stoneware and semi-vitreous products and for manufacturing of electro-technical porcelain. It can also be used for lubrication of moulds in the production of concrete parts.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 20°C	mm^2/s	5.2
kinematic viscosity at 40°C	mm^2/s	2.64
flash point	°C	82
saponification number	mg KOH/g	8
acid number	mg KOH/g	6

SEPARATION OIL

GENERAL DESCRIPTION:
Separation oil is made of highly refined mineral oil and a specially selected set of emulsifiers which make it easily mix with water, producing strong emulsion with good anti-adhesive and anti-corrosive properties.

APPLICATIONS:
Separation oil is used to produce separation emulsion for preventing adherence of asphalt-mass to metallic surfaces of asphalt transporting trucks and asphalt laying machines, e.g. to lubricate dump truck carrying body, asphalt laying machines, road rollers, etc. Recommended concentration of water based emulsion, water hardness up to 15°N, is 10-15%. Spreading by spraying or with a brush.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 40°C	mm^2/s	25.0
pour point	°C	-12
flash point	°C	174
stability of 10% emulsion based on water hardness 15°N after 48h	-	pass

ANTYKOL NQ

GENERAL DESCRIPTION:
ANTYKOL NQ is a low viscosity protection oil made of highly refined, mineral oil distillate. To guarantee protection, the distillate is enriched with anti-oxidation, anti-corrosive and other additives. Protective action of ANTYKOL N, depending on storage conditions, is 8 to 15 months.

APPLICATIONS:
ANTYKOL NQ is used for temporary protection against atmospheric corrosion of precise metallic product surfaces, usually working in low temperatures (up to -45°C).
It also may be used as lubrication oil, therefore it does not have to be removed from the operating surfaces prior to starting to operate the equipment.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 40°C	mm^2/s	19.5
kinematic viscosity at 50°C	mm^2/s	13
solidification point	°C	-45
flash point	°C	146
weld load	daN	200

ANTYKOL 100 S

GENERAL DESCRIPTION:
ANTYKOL 100 S protection and engine oil is made of highly refined oil distillate and a set of enriching additives of anti-oxidation, anti-corrosive and foaming inhibiting properties, and reducing deposits.

APPLICATIONS:
ANTYKOL 100 S protective and engine oil is used for corrosion protection of internal surfaces of combustion engines, air compressors, engine pumps. In motor vehicles, it is also used as engine oil with the interchange period up to 2 thousand kilometres.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 40°C	mm^2/s	104
viscosity index	-	106
pour point	°C	-26
flash point	°C	204

ANTYKOL TS 120

GENERAL DESCRIPTION:
ANTYKOL TS 120 protective oil is made through oil processing. The raffinate is enriched with anti-oxidation, anti-corrosive, washing and dispersing additives, as well as additives reducing the solidification point and increasing resistance to foaming.

APPLICATIONS:
ANTYKOL TS 120 protection oil is used for saturation of self-lubricating sintered sleeves and races of slide bearings.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 40°C	mm^2/s	120
viscosity index	-	109
flash point	°C	231
weld load	daN	200

AKORINOL® ŁT

GENERAL DESCRIPTION:
AKORINOL ŁT is made of paraffin-based light oil fractions enriched with anti-oxidative, washing, anticorrosive and foaming inhibiting additives. The product has high cleaning efficiency and good anticorrosive properties, as well as ability to inhibit so called perspiration corrosion.

APPLICATIONS:
AKORINOL ŁT oil is used for cleaning metallic products, including bearing parts and for corrosion protection of parts between operations.

PARAMETRY FIZYKOCHEMICZNE:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 20°C	mm^2/s	4,9
flash point (t.o.)	°C	125
flash point (t.z.)	°C	110
anticorrosive properties in moist environment (50°C/72h)	-	no corrosion

AKORINOL® NQ

GENERAL DESCRIPTION:
AKORINOL® NQ dewatering and protecting oil is made of properly refined oil distillates which are enriched with dewatering, anti-oxidation, anti-corrosive and foaming inhibiting additives. The oil produces a thin oil film with good protective properties. Depending on application conditions, the corrosion protection ability is between 6 and 9 months.

APPLICATIONS:
AKORINOL® NQ is used for dewatering of metallic surfaces after machining with water and oil-water fluids. It is also used for temporary corrosion protection of metallic products, machine parts and other metallic items during their storage and transport, when the application of low viscosity oil forming a thin film of good protective properties is required.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 20°C	mm^2/s	9.6
kinematic viscosity at 40°C	mm^2/s	3.2
flash point	°C	79
dewatering ability	-	pass
demulsifying ability	-	pass

AKORINOL® L-5Q

GENERAL DESCRIPTION:
AKORINOL® L-5Q is made of light oil fraction enriched with anti-oxidation, washing, anti-corrosive and foaming inhibiting additives. The product has high cleaning efficiency and good rust protection, as well as ability to inhibit the so called perspiration corrosion.

APPLICATIONS:
AKORINOL® L-5Q is used for washing metallic products and for inter-operation corrosion protection.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 20°C	mm^2/s	5.2
kinematic viscosity at 40°C	mm^2/s	3.16
solidification point	°C	-15
flash point	°C	78
rust protection in moist environment (50°C/72h)	-	no corrosion

LUBKORIN WAX

GENERAL DESCRIPTION:
Preservation oil.

APPLICATIONS:
LUBKORIN WAX, in a undiluted form, is intended for temporary anti-corrosive protection of clean metallic surfaces and chemically treated surfaces or covered in galvanic processes. It has the ability to displace water from metallic surfaces, so it can be used for protection against corrosion of parts machined with water soluble processing fluids. After the evaporation of the solvent, the entire surface is covered with sensible film which provides perfect corrosion protection. Recommended application methods of LUBKORIN WAX are immersion and spraying. The life of effective anti-corrosive protection:

- indoor storage – 16 to 20 months
- outdoor storage under cover – 6 months.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 20°C	mm^2/s	2.2
appearance	-	clear, brown liquid
density at 20°C	g/cm^3	0.804
flash point	°C	65

OILS FOR VARIOUS APPLICATIONS

EXPLOIL

GENERAL DESCRIPTION:
Oil made of mineral base oil and light oil fraction.

APPLICATIONS:
Oil intended for the production of explosives.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 40°C	mm^2/s	6.6
sulphur content	-	0.12
distillation up to 350°C	°C	83 (max.85)

KALIBROL® LUX

GENERAL DESCRIPTION:
KALIBROL® LUX is made from oil base obtained through conservative petroleum distillation of parrafin nature. The oil base is enriched with anti-corrosive additives.

APPLICATIONS:
KALIBROL® LUX is used for checking, adjustment, cleaning and maintenance of fuel system of self-ignition engines. It can also be used for corrosion protection of fuel systems metallic parts stored according to user manuals of which limit storage time is up to one year.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 40°C	mm^2/s	2.60
clouding temperature	°C	-11
flash point	°C	88
corrosive action on cooper plates 3h /100°C	rating	pass

HEATING MEDIA

ITERM 6 MB

GENERAL DESCRIPTION:
ITERM 6 MB oil for heating devices is made of refined, mineral base oil. It contains dispersing and washing additives as well as additives improving resistance to foaming. Owing to that, ITERM 6 MB exhibits great resistance to thermal degradation and oxidation, sufficient viscosity which results in easy system start-up and highly efficiently maintained oil circulation, long operating time without decomposition products, increasing product viscosity, and high heat exchange index.

APPLICATIONS:
ITERM 6 MB is used as heat carrier in heating closed-circuit heating systems, in temperature range from -10 to 285°C, industrial cooling and heating systems (a product used in systems of capacity as high as a dozen thousand litres), heaters and oil systems for heating, among others, bitumen products for road constructions, furnaces fired with solid fuel, provided with additional heat drawing systems. It is recommended for maintaining forced turbulent flow in heating systems, and the temperature differential between oil film around the heating component should not increase 15-30°C.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 40°C	mm^2/s	41.1
kinematic viscosity at 100°C	mm^2/s	6.1
solidification point	°C	-18
flash point	°C	225
carbon residue	% (m/m)	0.3

ITERM 100

GENERAL DESCRIPTION:
Mineral heating oil made of selected mineral oil base.

APPLICATIONS:
ITERM 100 heating oil can be used as a heat carrier in systems and heating units, where the temperature does not exceed 200°C. It can be used in both: open and hermetically closed circuits.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
kinematic viscosity at 100°C	mm^2/s	4.0
pour point	°C	-15
flash point	°C	200
viscosity index	-	95

ALITEN EP

STANDARDS, SPECIFICATIONS:
ALITEN EP-0:
DIN 51 502: KP0N-20, ISO 6743-9: BDHB-0
ALITEN EP-1:
DIN 51 502: KP1N-20, ISO 6743-9: BDHB-1
ALITEN EP-2:
DIN 51 502: KP2N-20, ISO 6743-9: BDHB-2
ALITEN EP-3:
DIN 51 502: KP3N-20, ISO 6743-9: BDHB-3

GENERAL DESCRIPTION:
ALITEN EP multipurpose plastic grease is made of refined mineral oil (with the cinematic viscosity at 100°C ca.15-20 mm/s) thickened with complex aluminium soap. The grease is enriched with adequate additives of the EP type as well as anti-corrosive and anti-oxidation additives.

APPLICATIONS:
Lubricating rolling bearings, operating in the temperature range between -20°C and +140°C,
ALITEN EP-0 is intended to lubricate bearings in equipment with central lubricated system, operating in low temperatures and requiring forcing grease to long distances,
ALITEN EP-1 is intended to lubricate bearings in equipment with central lubricated system, operating in moderate temperatures and requiring forcing grease to long distances,
ALITEN EP-2 is intended to lubricate bearings in equipment with central lubricated system, operating in high ambient temperatures and not requiring forcing grease to long distances,
ALITEN EP-3 intended to lubricate bearings of units with individual lubrication systems.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES			
		ALITEN EP-0	ALITEN EP-1	ALITEN EP-2	ALITEN EP-3
NLGI class		0	1	2	3
worked penetration at 25°C	mm/10	382	335	286	224
dropping point	°C	198	230	265	209
oil separation from grease, 100°C/24h	% (m/m)	-	3	0.5	2
lubricating properties on a four ball pressure tester, weld load	kG	160			
base oil viscosity (mineral oil) at 40°C	mm^2/s	150			

LITEN NANO 00, 2, 3

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES		
		LITEN 00	LITEN 2	LITEN 3
worked penetration at 25°C	°C	415	286	238
dropping point, min.	°C	219	231	227
resistance to water washout dyn. meth. 79°C	%	1.5	1.2	1.8
weld load, min.	kG	500	500	500
base oil viscosity (mineral oil) at 40°C	mm^2/s	110		

STANDARDS, APPROVALS, SPECIFICATIONS:
LITEN NANO 00:
ISO 6743-9: CDEB-00
DIN 51 502: KPF00N-30

LITEN NANO 2:
ISO 6743-9: CDEB-2
DIN 51 502: KPF2N-30

LITEN NANO 3:
ISO 6743-9: CDEB-3
DIN 51 502: KPF3N-30

colour: silver-black

GENERAL DESCRIPTION:
The lubricants LITEN NANO are complex lithium greases based on the naphthenic oil. The lubricants are tempered by anticorrosion and EP additives. Due to the thickener used in them, they are characterized by high resistance to water washout. This lubricant is resistant to corrosion, oxidation and washing out the water; it contains a unique NANO formula, which includes a mixture of solid lubricant nano-particle bodies. The high content of the composition NANO makes the grease adhere perfectly to the lubricated surfaces, forming a durable film, resistant to heavy loads, thereby reducing friction and wear of the coexisting surfaces.

APPLICATIONS:
LITEN NANO is designed for the lubrication of rolling bearings, plain bearings and heavy duty friction associations working in the temperature range: -30°C to + 140°C. LITEN NANO is also recommended for use where there is a frequent change of direction or a combination of low and high velocity as well as heavy loads in particular impact loads, for instance in constant velocity joints.
Its high anti-wear parameters reduce friction of contact surfaces which reduces the surface wear.

SMAROL NANO

for lawn mowers and brushcutters

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
worked penetration at 25°C	°C	281
dropping point	°C	232
resistance to water washout dyn. meth. 79°C	%	1.0
weld load	kG	500
scar diam, 40 kG, 1h	mm	0.5
base oil viscosity (mineral oil) at 40°C	mm^2/s	100

STANDARDS, SPECIFICATIONS:
DIN 51 502: KF2N-30
ISO 6743-9: CEDB-2
consistency class: NLGI 2
colour: silver-black

GENERAL DESCRIPTION:
SMAROL NANO for lawn mowers and brushcutters is dedicated for greasing angular bearings of brushcutters and trimmers. The grease is produced of high-quality base oil thickened with complex lithium soap. It is refined with anti-corrosive addditives and EP. Thanks to the addition of the thickener the grease is characterized by high dropping point and mechanical stability. This grease is resistant to corrosion, oxidation and washout by water. It contains a unique NANO formula, thanks to which it adheres perfectly to lubricated surfaces creating a long-lasting layer resistant to very heavy loads, acids, alkalies, and high temperatures. Using a substance of currently lowest known friction coefficient (COF) under 0,3 ensures very good properties preventing friction damage.

APPLICATIONS:
SMAROL NANO for lawn mowers and brushcutters is dedicated for most of all for greasing angular bearings of brushcutters and trimmers, both with a combustion engine and electrical. It may successfully be used at home, in a workshop and on a farm for greasing and protecting against corrosion of hinges, locks, threads and elements of vehicles and machines. SMAROL NANO for lawn mowers and brushcutters is dedicated for use in a wide variety of temperatures between -30°C and +160°C, and in dry-greasing conditions even up to over 500°C. SMAROL NANO for lawn mowers and brushcutters ensures reduction of friction resistance, which is delivered by very high parameters of weld load – 500 kG and a very low scar diameter – 0,5 mm.

GREASEN SYNTEX HT 2

STANDARDS, SPECIFICATIONS:
DIN 51 502: KP2R-50
ISO 6743-9: EFHB-2
NLGI: 2
APPROVALS:
HSW SA

GENERAL DESCRIPTION:
GREASEN SYNTEX HT 2 grease is made of high quality synthetic base oil and inorganic thickener. It also includes additives improving anti-wear, lubricating, anti-corrosive and anti-oxidation properties. It allows for lubricating of mechanisms exposed to impact loads, vibrations, high dustiness, moisture, water washing. It is practically infusible, antistatic and is compatible with copper alloy elements and many elastomers, which allows lubricating of metal-plastic or metal-rubber friction parts.

APPLICATIONS:
GREASEN SYNTEX HT 2 - high temperature complex lithium grease based on synthetic oil. It is intended to lubricate heavy-duty rolling and sliding bearings and other mechanisms operated in the temperature range from -50°C to +180°C. Due to its high durability, it can be used for long-term and maintenance-free lubricating of machines and devices of various types operating in the temperature up to 130°C, with no need of additional lubrication during normal operation. Its main fields of use are mining, metallurgy, cement industry, papermaking industry, electronic/electric industry.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
NLGI class		2
worked penetration at 25°C	mm/10	285
dropping point	°C	290
oil separation from grease, 100°C/30h	% (m/m)	2.6
corrosive action on copper plates, 100°C/3h	rating	1
protection against corrosion EMCOR test	points	0-0
lubricating properties on a four ball pressure tester, weld load	kG	250
base oil viscosity at 40°C	mm^2/s	48

GREASEN COMPLEX 2

STANDARDS, SPECIFICATIONS:
DIN 51502: KP2P-40
ISO 6743-9: DEHB-2
ASTM D4950: GC
NLGI: 2

GENERAL DESCRIPTION:
GREASEN COMPLEX 2 is made of highly refined mineral base oil with the kinematic viscosity at 40°C 85 cSt and complex lithium thickener. It also includes additives improving anti-wear, lubricating, anti-corrosive and anti-oxidation properties. It is characterised by high dropping point, very good pumping ability, high resistance to hot water, good lubricating properties, low temperature stability, compatibility with copper elements as well as good stability during storage.

APPLICATIONS:
Multipurpose, high temperature resistant GREASEN COMPLEX 2 grease is intended to lubricate heavy-duty rolling and sliding bearings and other mechanisms, also using central lubrication systems, operating in the temperature range between -30°C and 160°C, periodically up to 180°C. GREASEN COMPLEX 2 is specially recommended to lubricate bearings of car wheel hubs, electric motors, fans, guides, articulated joints and other automotive and industry mechanisms. Due to its high durability, it can be used for long term and unmanned lubricating of machines and devices of various types, with no need of additional lubrication during normal operation.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
NLGI class		2
worked penetration at 25°C	mm/10	285
dropping point	°C	270
oil separation from grease, 100°C/24h	% (m/m)	1.3
corrosive action on cooper plates, 100°C/3h	rating	1
protection against corrosion EMCOR test	points	0-0
lubricating properties on a four ball pressure tester, weld load	kG	250
base oil viscosity at 40°C	mm^2/s	85

LITEN® PREMIUM ŁT-4EP

APPROVALS:
LITEN PREMIUM ŁT-4EP2: ZETOR (Proxima, Proxima Plus, Proxima Power, Forterra)
STANDARDS, SPECIFICATIONS:
LITEN PREMIUM ŁT-4EP1:
DIN 51 502: KP1N-30, ISO 6743-9: CDHB-1
LITEN PREMIUM ŁT-4EP2:
DIN 51 502: KP2N-30, ISO 6743-9: CDHB-2
LITEN PREMIUM ŁT-4EP3:
DIN 51 502: KP3N-30, ISO 6743-9: CDHB-3

GENERAL DESCRIPTION:
LITEN® PREMIUM ŁT-4EP are lithium greases intended to lubricate various friction parts operating in the temperature range of -35°C to +140°C and under medium loads. They are characterised with high tribological performance and resistance to ageing. Modern composition of enriching additives applied in LITEN® PREMIUM ŁT-4EP provides also a higher dropping point, better properties in low temperatures and better resistance to water wash out compared to standard lithium greases.

APPLICATIONS:
LITEN® PREMIUM ŁT-4EP greases are used to lubricate: rolling and sliding bearings including central lubricating systems (LITEN® PREMIUM ŁT-4EP1, ŁT-4EP2), light-duty and medium-duty low-speed gears, machine articulated joints and slide guides, other friction parts in industrial applications, and also as multipurpose automotive grease.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES		
		LITEN PREMIUM ŁT-4 EP1	LITEN PREMIUM ŁT-4 EP2	LITEN PREMIUM ŁT-4 EP3
NLGI class		1	2	3
worked penetration at 25°C	mm/10	320	280	230
dropping point	°C	251	255	265
oil separation from grease, 100°C/24h	% (m/m)	2.2	0.1	0.0
lubricating properties on a four ball pressure tester, weld load	daN	250		
base oil viscosity (mineral oil) at 40°C	mm^2/s	150		

LITEN® ŁT-4

STANDARDS, SPECIFICATIONS:
LITEN ŁT-41:
DIN 51 502: K1K-30, ISO 6743-9: CCHA-1
LITEN ŁT-42:
DIN 51 502: K2K-30, ISO 6743-9: CCHA-2
LITEN ŁT-43:
DIN 51 502: K3K-30, ISO 6743-9: CCHA-3

GENERAL DESCRIPTION:
LITEN® ŁT-4 greases are universal lithium greases based on mineral paraffin oil. They are refined with an enriching pack of additives with anti-oxidation, anti-corrosive and lubricating properties. LITEN® ŁT-4 greases are resistant to water.

APPLICATIONS:
LITEN® ŁT-4 greases are used to lubricate rolling and sliding bearings operating in the temperature range of - 30°C to +130°C.
Grease selection depends on the method of grease feeding (e.g. central lubrication, manual lubrication), rotational speed and bearing working temperature.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES		
		LITEN ŁT-41	LITEN ŁT-42	LITEN ŁT-43
NLGI class		1	2	3
worked penetration at 25°C	mm/10	326	285	237
dropping point	°C	200	202	205
oil separation from grease, 100°C/24h	% (m/m)	-	0.8	0.2
corrosive action on a copper plate 100°C/3h	rating	1		
base oil viscosity (mineral oil) at 40°C	mm^2/s	85		

LITEN® ŁT-4P

STANDARDS, SPECIFICATIONS:
Liten ŁT-4P2:
DIN 51 502: KP2N-30
ISO 6743-9: CDHA-2
Liten ŁT-4P3:
DIN 51 502: KP3N-30
ISO 6743-9: CDHA-3
APPROVED BY: FŁT Kraśnik - Liten ŁT4-P3

GENERAL DESCRIPTION:
LITEN® ŁT-4P plastic greases are manufactured in the process of densification of high refined mineral oil with lithium soap of 12 hydroxystearine acid. LITEN® ŁT-4P greases are enriched with antioxidative and anticorrosive additives as well as additives improving lubricating properties. They are high quality multipurpose greases.

APPLICATIONS:
LITEN® ŁT-4P are manufactured in 1, 2 and 3 consistency classes. They are applied for lubricating of covered rolling bearings operating in temperatures between -30°C and +140°C in conditions requiring the following properties: resistance to oxidation, corrosion protection, resistance to water and mechanical stability. LITEN® ŁT-4P greases may also be used to lubricate sliding bearings.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES	
		LITEN ŁT-4P2	LITEN ŁT-4P3
NLGI class		2	3
worked penetration at 25°C	mm/10	285	240
dropping point	°C	190	189
oil separation from grease, 100°C/24h	% (m/m)	2	4
lubricating properties on a four ball pressure tester, weld load	kG	178	180
base oil viscosity at 40°C	mm^2/s	85	

LITEN® EPX

STANDARDS, SPECIFICATIONS:
LITEN EPX-00:
DIN 51 502: GP00K-20, ISO 6743-9: BCEB-00
LITEN EPX-0:
DIN 51 502: GP0K-20, ISO 6743-9: BCEB-0
LITEN EPX-1:
DIN 51 502: GP1K-20, ISO 6743-9: BCEB-1
APPROVALS:
LITEN EPX-00: MESKO-ROL, ZENTEX

GENERAL DESCRIPTION:
LITEN® EPX semi-liquid gear lithium greases are based on mineral oil with the kinematic viscosity of ca. 150 mm^2/s at 40°C. Due to required better lubricating properties, they are enriched with EP additives as well as additives increasing adhesion, anti-oxidation and anti-corrosive properties.

APPLICATIONS:
LITEN® EPX greases are intended to lubricate closed toothed cylindrical and bevel gears, operating in the temperature range between - 20°C and +120°C.
The choice of LITEN® EPX grease depends on the design and sealing degree of the gear and working temperature.
LITEN® EPX 00 is used in lower temperatures than those given above and in the case of good sealing of the gear,
LITEN® EPX 0 is used in moderate conditions,
LITEN® EPX1 is used in higher temperatures than those given above and in the case of poor sealing of the gear
.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES		
		EPX 00	EPX 0	EPX 1
NLGI class		00	0	1
worked penetration at 25°C	mm/10	420	382	315
dropping point	°C	173	190	185
oil separation from grease, 100°C/24h	% (m/m)	-	-	9.5
lubricating properties on a four ball pressure tester, weld load	kG	200		
base oil viscosity (mineral oil) at 40°C	mm^2/s	150		

LITEN® EP

STANDARDS, SPECIFICATIONS:
LITEN® EP-0
DIN 51 502: KP0K-20, ISO 6743-9: BCHB-0
LITEN® EP-1
DIN 51 502: KP1K-20, ISO 6743-9: BCHB-1
LITEN® EP-2
DIN 51 502: KP2K-20, ISO 6743-9: BCHB-2
LITEN® EP-3
DIN 51 502: KP3K-20, ISO 6743-9: BCHB-3

GENERAL DESCRIPTION:
LITEN® EP plastic greases are made of refined mineral oil with the viscosity of about 85 mm^2/s at 40°C, the lithium soaps of 12- hydroxy stearic acid and a set of additives increasing their lubricating, antio-oxidation and anti-corrosive properties.

APPLICATIONS:
LITEN EP-0 is intended to lubricate bearings in equipment with central lubricating system, operating in low temperatures (-20 to +120°C) and requiring forcing grease to long distances,
LITEN EP-1 is intended to lubricate bearings in equipment with central lubricating system, operating in moderate ambient temperatures and requiring forcing grease to long distances,
LITEN EP-2 is intended to lubricate bearings in equipment with individual and central lubricating system, operating in high ambient temperatures and requiring forcing grease to short distances,
LITEN EP-3 intended to lubricate bearings of units with individual lubrication systems.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES			
		LITEN® EP-0	LITEN® EP-1	LITEN® EP-2	LITEN® EP-3
NLGI class		0	1	2	3
worked penetration at 25°C	mm/10	378	332	293	238
dropping point	°C	190	202	210	215
oil separation from grease, 100°C/24h	% (m/m)	-	3.8	0.6	0.3
weld load	kG	250			
base oil viscosity (mineral oil) at 40°C	mm^2/s	150			

GREASEN ŁT-4 S-2, S-3

STANDARDS, SPECIFICATIONS:
GREASEN ŁT-4 S-2
DIN 51502: KP2K-30
ISO 6743-9: CCEA-2

GREASEN ŁT-4 S-3
DIN 51502: KP3N-20
ISO 6743-9: BDEA-3

GENERAL DESCRIPTION:
A mineral-oil-based grease, thickened with lithium hydroxystearate, GREASEN ŁT-4S contains enhancing additives, in particular, anti-corrosive and anti-oxidation additives, as well as additives improving lubrication properties. GREASEN ŁT-4 S-2 is water resistant. The operating temperature range is:
GREASEN ŁT-4 S-2: -30°C÷120°C
GREASEN ŁT-4 S-3: -20°C÷130°C

APPLICATIONS:
GREASEN ŁT-4S2 grease is used to lubricate:
- automotive anti-friction bearings;
- cross joints during their installation;
- pull rods and guides of machines as well as other machine elements;
- friction bearings working in the grease acceptable range of temperatures.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES	
		ŁT 4S2	ŁT 4S3
worked penetration at 25°C	mm/10	285	248
dropping point	°C	200	200
tendency to release grease from the bearings (130°C, 16h, 660 rpm/min)	%	1.2	1.1
weld load	kG	200	200
resistance to water washout dyn. meth. 79°C	%	3.5	2.8
base oil viscosity at 40°C	mm^2/s	85	85

GREASEN EP-23

STANDARDS, SPECIFICATIONS:
DIN 51502: KF2N-30
ISO 6743-9: CDEB-2
APPROVED BY:
REMAG

GENERAL DESCRIPTION:
GREASEN EP-23 is a complex lithium grease with a molybdenum disulfide content (3%), resistant to moisture, steam and light acids, bases and vibration, high pressures and shock loads.

APPLICATIONS:
GREASEN EP-23 is intended for the lubrication of heavy-duty friction centres operating in temperatures between -30° to +140°C.
It is recommended for application everywhere where frequent direction changes or simultaneous low speeds and high loads occur, e.g. in constant velocity joints.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
worked penetration at 25°C	mm/10	286
dropping point	°C	203
lubricating properties, weld load	kG	315
resistance to water at 38°C	%	0.012
base oil viscosity at 40°C	mm^2/s	150

LITEN LC EP

STANDARDS, SPECIFICATIONS:
LITEN LC EP 0
DIN 51 502: KP0K-30; ISO 6743-9: CCHB-0
LITEN LC EP 1
DIN 51 502: KP1K-30; ISO 6743-9: CCHB-1
LITEN LC EP 2
DIN 51 502: KP2K-30; ISO 6743-9: CCHB-2
LITEN LC EP 3
DIN 51 502: KP3K-30; ISO 6743-9: CCHB-3

GENERAL DESCRIPTION:
The plastic lubricants LITEN LC EP are produced based on the highly refined, mineral oil base and lithium - calcium thickener. Its composition includes additive combination improving the lubrication, antioxidant and anti-corrosive properties. The plastic lubricants LITEN LC EP due to the lithium - calcium thickener used are highly resistant to water washout. They also provide anti-corrosive protection in humid conditions.

APPLICATIONS:
The lubricants LITEN LC EP are designed primarily for the lubrication of rolling bearings working at high loads, in the temperature range -30 to 120°C, as well as when bearings with less load experience impact loads. Operating temperature limits may be higher or lower depending on the bearing type and required periods of lubrication.

LITEN LC EP–0 is designed for the lubrication of equipment with central lubricating systems, operating at low temperatures and requiring pumping grease on very long distances in the temperature range -30°C to 120°C.

LITEN LC EP–1 is designed for the lubrication of bearings in the equipment with central lubricating systems, operating at medium ambient temperatures and requiring pumping grease on very long distances in the temperature range -30°C to 120°C.

LITEN LC EP–2 is designed for the lubrication of bearings in the equipment with individual and central lubricating systems, operating at high ambient temperatures and requiring pumping grease on short distances in the temperature range -30°C to 120°C.

LITEN LC EP–3 is intended for the lubrication of bearings in the equipment with individual lubricating system in the temperature range -30 to 120°C.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES			
		EP 0	**EP 1**	**EP 2**	**EP 3**
worked penetration at 25°C	mm/10	378	322	278	243
dropping point	°C	191	195	204	209
corrosive action on cooper plates, 100°C/24 h	-	pass			
resistance to water washout dyn. meth. 79°C	%	1.2	1.4	0.6	0.7
oil separation from grease, 100°C/24h	%	-	1.8	1.2	0.3
weld load	kG	250			
base oil viscosity at 40°C	mm^2/s	85			

SMAROL UNIWERSALNY EKO

ECOLOGICAL PLASTIC GREASE FOR GENERAL PURPOSES

NORMS, APPROVALS, SPECIFICATIONS:
DIN 51 502: K2/3K-30
ISO 6743-9: CCHA-2/3
consistency class: NLGI 2/3
colour: green

GENERAL DESCRIPTION:
Plastic grease SMAROL UNIWERSALNY EKO is produced by thickening a blend of highly-refined base oil and bio-degradable oil with lithium soap. The grease is refined with additives that improve its greasing properties and have an anti-corrosive and anti-oxidation influence. SMAROL UNIWERSALNY EKO grease belongs to easy biodegradable preparations, because its decomposition reaches 96% after 21 days (the result confirmed by the CEC L-33-A-94 test performed by Environmental Engineering Faculty of Warsaw University of Technology).

APPLICATIONS:
SMAROL UNIWERSALNY EKO is dedicated for use in a wide variety of temperatures between - 30°C and + 140°C and ensures perfect lubrication even in the toughest exploitation conditions. Multipurpose SMAROL UNIWERSALNY EKO may successfully be used at home, in a workshop or on a farm for lubricating:

- hinges, locks, threads,
- chains, gear wheels
- rolling and sliding bearings
- elements of vehicles as well as industrial and agricultural machines.

It reduces wear and friction and ensures resistance to humidity.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
worked penetration at 25°C	mm/10	251
dropping point	°C	210
oil separation from grease, 100°C/24h	%	4.1
weld load	kG	200
copper strip corrosion plate, 100°C/24h	-	pass
base oil viscosity at 40°C	mm^2/s	100

GREASEN N-EP 00/000

STANDARDS, SPECIFICATIONS:
NLGI: 00/000
DIN 51502: KP00/000E-45
ISO 6743-9: CBEB-00/000

GENERAL DESCRIPTION:
GREASEN N-EP 00/000 is a semi-liquid grease produced basing on lithium and lime soap with consistency class NLGI 00/000. It contains EP and AW additives, as well as agents improving anti-corrosion and anti-oxidation properties.

APPLICATIONS:
GREASEN N-EP 00/000 is intended primarily for lubricating friction centres in heavy commercial vehicles and buses with central lubricating systems, within the temperature range of -30°C to +90°C. In the case of double-ended lubrication, the max. application temperature is +120°C.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
worked penetration at 25°C	mm/10	410
penetration at temp. -30°C	mm/10	310
dropping point	°C	168
mechanical stability, 60°C/4h	% [mm]	2.9
weld load	kG	250
the copper plate corrosion, 100°C/3h	-	1
base oil viscosity at 40°C	mm^2/s	36

GREASEN S-EP 00/000

STANDARDS, SPECIFICATIONS:
NLGI: 00/000
DIN 51502: KP00/000E-30
ISO 6743-9: EBEB-00/000

GENERAL DESCRIPTION:
GREASEN S-EP 00/000 is a semi-liquid grease produced on a lithium and lime soap base with consistency class of NLGI 00/000. It contains EP and AW additives, as well as agents improving anti-corrosion and anti-oxidation properties.

APPLICATIONS:
GREASEN S-EP 00/000 is intended primarily for lubricating friction centres in heavy commercial vehicles and buses with central lubricating systems, within a temperature range of -45°C to +90°C. In the case of total loss lubrication, the upper limit value of use in both cases equals +120°C

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
worked penetration at 25°C	mm/10	433
penetration at temp. -45°C	mm/10	166
dropping point	°C	182
mechanical stability, 60°C/4h	% [mm]	2.7
weld load	kG	250
the copper plate corrosion, 100°C/3h	-	1
base oil viscosity at 40°C	mm^2/s	19

MACHINE GREASE 2, 3

STANDARDS, SPECIFICATIONS:
MACHINE GREASE 2:
DIN 51 502: K2C-10
ISO 6743-9: AAHA-2
MACHINE GREASE 3:
DIN 51 502: K3C-10
ISO 6743-9: AAHA-3

GENERAL DESCRIPTION:
THE MACHINE GREASES 2 and 3 are made of refined oil bases with viscosity of 85 mm²/s at 40°C and calcium soaps of high-molecular fatty acids. They are water resistant. They may be applied in central lubrication systems.

APPLICATIONS:
THE MACHINE GREASES 2 and 3 are intended to lubricate sliding bearings and other friction surfaces within the temperature range of -10°C to +60°C.
THE MACHINE GREASE 2 is used for lubrication when it is to be delivered through small diameter long conduits, whereas **THE MACHINE GREASE 3** is used when better bearing sealing is required, and if it is to be delivered to shorter distances through larger diameter conduits.
THE MACHINE GREASE 2 and 3 is suitable for lubrication of rolling bearings.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES	
		MACHINE GREASE 2	MACHINE GREASE 3
NLGI class		2	3
worked penetration at 25°C	mm/10	286	235
dropping point	°C	89	95
water content	%	1.1	1.0
base oil viscosity (mineral oil) at 40°C	mm²/s	85	

KALTON EP

STANDARDS, SPECIFICATIONS:
KALTON EP-1
DIN 51 502: KP1C-20
ISO 6743-9: BAHB-1
KALTON EP-2:
DIN 51 502: KP2C-20
ISO 6743-9: BAHB-2

GENERAL DESCRIPTION:
KALTON EP plastic grease is made of refined mineral oil with the viscosity minimum 85 mm²/s at 40°C, calcium soaps of high molecule fatty acids and adequate additives increasing the strength of the lubricating film. KALTON EP grease is resistant to water washing and guarantees corrosion protection in moist environment.

APPLICATIONS:
KALTON EP grease is intended to lubricate highly loaded rolling bearings, especially if they are exposed to impact loads, working in the temperature range between -20°C and +60°C, including water presence, e.g. roll stands of metals, presses, heavy building machines, etc.
KALTON EP-1 is recommended for central lubricating systems,
KALTON EP-2 is recommended for manual lubricating and to lubricators situated near the lubricating centre.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES	
		KALTON EP-1	KALTON EP-2
NLGI class		1	2
worked penetration at 25°C	mm/10	325	288
dropping point	°C	98	104
corrosive action on copper plates, 50°C/50h	-	pass	pass
lubricating properties on a four ball pressure tester, weld load	kG	250	
base oil viscosity (mineral oil) at 40°C	mm²/s	85	

CSW ROLLING MACHINES GREASE

STANDARDS, SPECIFICATIONS:
CSW-1:
DIN 51 502: K1C0
ISO 6743-9: BAHA-1
CSW-2:
DIN 51 502: K2C0
ISO 6743-9: BAHA-2

GENERAL DESCRIPTION:
THIS ROLLING MACHINE GREASE is made of refined mineral oil with the viscosity of minimum 150 mm²/s at 40°C, calcium soaps of fatty acids and adequate sulphurised vegetable acid.
Depending on the consistence there are two grease types: CSW-1 and CSW-2. CSW grease is resistant to water.

APPLICATIONS:
THIS ROLLING MACHINE CSW GREASE of improved lubricating properties is intended to lubricate rolling bearings of central lubricated rolling stands and auxiliary devices in working temperatures which do not exceed 60°C, and for other devices exposed to high and impact loads.
CSW-1 is recommended if the grease is to be delivered through small diameter long conduit or at low ambient temperatures.
CSW-2 is recommended if conduits are shorter and of larger diameter and if grease sealing properties are required.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES	
		CSW-1	CSW-2
NLGI class		1	2
worked penetration at 25°C	mm/10	310	270
dropping point	°C	92	89
corrosive action on steel plates 100°C/3h	-	pass	pass
base oil viscosity (mineral oil) at 40°C	mm²/s	150	

GREASE FOR L, Z BRAKING MECHANISMS

STANDARDS, SPECIFICATIONS:
GREASE FOR L BRAKING MECHANISMS:
DIN 51 502: M0C0
ISO 6743-9: AAEA-0
GREASE FOR Z BRAKING MECHANISMS:
DIN 51 502: M00C-20
ISO 6743-9: AAEA-00

GENERAL DESCRIPTION:
GREASE FOR L AND Z BRAKING MECHANISMS is made of refined mineral oils and calcium soaps of high molecule fatty acids.

APPLICATIONS:
A BRAKE MECHANISM GREASE – calcium, seasonal, intended to lubricate switching equipment of railway brake mechanisms.
L BRAKE MECHANISM GREASE – used in summer time.
Z BRAKE MECHANISM GREASE – used in winter time.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES	
		L	Z
worked penetration at 25°C	mm/10	348	405
dropping point	°C	150	80
free bases content for NaOH	%	0.18	0.22
base oil viscosity (mineral oil) at 40°C	mm²/s	150	

GREASEN STP

STANDARDS, SPECIFICATIONS:
DIN 51502: M1C-20,
ISO 6743-9: BAEA-1

GENERAL DESCRIPTION:
GREASEN STP is calcium grease of NLGI 1 consistency class. Made of mineral oil base of viscosity approximately 85 mm^2/s at 40°C.

APPLICATIONS:
GREASEN STP is intended exclusively for periodical lubrication of vehicle chassis, pins, articulations, guides in the temperature range between -20°C to +60°C. It is quite resistant to cold water. Not suitable for lubricating rolling bearings and water pumps.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
worked penetration at 25°C	mm/10	330
dropping point	°C	105
base oil viscosity (mineral oil) at 40°C	mm^2/s	85

GREASEN GRAFIT

STANDARDS, SPECIFICATIONS:
DIN 51502: KF2C-20,
ISO 6743-9: BAGB-2

GENERAL DESCRIPTION:
GREASEN GRAFIT is a mineral oil based calcium grease with viscosity of ca. 110 mm^2/s at 40°C containing minimum 10% natural graphite.

APPLICATIONS:
GREASEN GRAFIT is intended to lubricate: automotive suspension springs, open toothed gears, worm gears, threads of screws exposed to corrosive agents, chains and other heavily loaded friction centres operating in the temperatures between -20°C to + 60°. It can be used as typical assembly grease. It demonstrates resistance to cold water. It cannot be used to lubricate any vehicle elements other than the suspension springs. Not suitable for anti-friction bearings and other precision mechanisms.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
worked penetration at 25°C	mm/10	270
dropping point	°C	90
released oil (structural stability)	%	3.0
water content	%	2.0
lubricating properties on a four ball pressure tester, weld load	kG	250
base oil viscosity (mineral oil) at 40°C	mm^2/s	110

KZE GREASE FOR TOOTHED GEARS

STANDARDS, SPECIFICATIONS:
KZE-L grease::
DIN 51 502: GP00/000C-0
ISO 6743-9: AAEB-00/000

KZE-Z grease:
DIN 51 502: GP000C-25
ISO 6743-9: BAEB-00/000

GENERAL DESCRIPTION:
KZE grease is made with refined oil base and a set of enriching additives especially increasing the strength of the lubricating film and decreasing solidification point (applicable to KZE-Z winter grease).

APPLICATIONS:
KZE grease is used to lubricate closed toothed gears of wheel sets of electric rail vehicles.
KZE-L is applied in the summer period in the temperatures from 0°C to 60°C; and KZE-Z is applied in the winter period in the temperatures from -25°C to 40°C.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES	
		KZE-L	KZE-Z
worked penetration at -25°C	mm/10	-	186
relative viscosity prior to addition of solvent, at 100°C	°E	10.6	6.2
lubricating properties on a four ball pressure tester, weld load	kG	250	250
dropping point	°C	230	226
base oil viscosity at 40°C	mm^2/s	150	

KZ GREASE FOR TOOTHED GEARS

STANDARDS, SPECIFICATIONS:
ISO 6743-9: BAHA

GENERAL DESCRIPTION:
KZ toothed gear grease is made with spindle oil of adequate viscosity, distillate and viscous substances, P-40 industrial asphalt and rosin. It contains TRI (trichloroethylene) solvent.

APPLICATIONS:
Lubrication of low-speed and open head toothed gears, and bevel gears at working temperature up to +40°C. Lubrication of worm gears made of bronze and cast steel.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
relative viscosity prior to addition of solvent, at 100°C	°E	14
flash point	°C	162
drop point after solvent evaporation	°C	36
corrosive action on steel plates 100°C/3h	-	pass
weld load	kG	250
base oil viscosity at 40°C	mm^2/s	90

LR CABLE GREASE

STANDARDS, SPECIFICATIONS:
DIN 51 502: M5C-20
ISO 6743-9: BABA-4

GENERAL DESCRIPTION:
THE LR CABLE GREASE is made of refined mineral oil and hydrocarbonate thickeners.

APPLICATIONS:
LR GREASE is intended for the preservation of various construction steel cables/ropes during production. It is suitable to lubricate neither hoisting ropes of drum hoists nor Koepe pulleys.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
worked penetration at 25°C	mm/10	188
dropping point	°C	65
lubricating properties on a four ball pressure tester, weld load	kG	200
fragility temperature	°C	< -38
base oil viscosity at 40°C	mm^2/s	540

HUTPLEX HV

GENERAL CHARACTERISTICS:
HUTPLEX HV is multi-purpose grease in the NLGI No. 1.5 consistency class that belongs to a new group of lubricants offered by ORLEN OIL, characterized by high mechanical and thermal resistance, and resistance to water and corrosive activity of external factors. The high share of sulphonate thickener provides unique properties of anti-wear, high pressure resistance and excellent corrosion resistance in salt water and hot water environments.

APPLICATION:
High temperature sulphonate greases HUTPLEX HV are highly adhesive EP greases to lubricate machine parts in the mining, metallurgical, heavy and marine industries, especially for the friction nodes exposed to high shock loads and low operating friction torques in high-dust, in terms of exposure to water and brine . The grease is ideal for coal and copper mines to lubricate bearings, bolt connections, and other mechanisms, machines and equipment operating within the temperature range: -30 to 180 ° C. HUTPLEX HV works also in difficult metallurgical applications, for lubrication of bearings in the standing rolling mills.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
NLGI class		1.5
worked penetration at 25°C, 60 times	mm/10	302
the application temperature range	°C	-30 to 180
dropping point	°C	>300
base oil viscosity at 40°C	mm^2/s	420
welding load	kG	800

HUTPLEX WR-1, WR-2

GENERAL CHARACTERISTICS:
Multi-purpose HUTPLEX WR greases are highly adhesive lubricants with high mechanical and thermal resistance, and resistance to water and corrosive activity of external factors. The high share of sulphonate thickener provides unique properties of anti-wear, high pressure resistance and excellent corrosion resistance in salt water and hot water environments.

APPLICATION:
High temperature sulphonate greases WR HUTPLEX are intended to lubricate machine elements in the steel industry, especially the roller bearings of a rolling mill and other friction nodes exposed to high temperatures. Thanks to the extraordinary thermal stability of HUTPLEX WR greases recover the original structure right after returning to ambient temperature. They are ideal for the lubrication of machines and equipment for mining coal, copper, cement manufacturers, steel, heavy industry and all friction nodes exposed to extreme pressure and water while requiring maximum protection against corrosion.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES	
		HUTPLEX WR-1	HUTPLEX WR-2
NLGI class		1	2
worked penetration at 25°C, 60 times	mm/10	318	278
the application temperature range	°C	-30 to 180	-25 to 180
dropping point	°C	>300	>300
base oil viscosity at 40°C	mm^2/s	180	180
welding load	kG	800	800

BENTONITE GREASES

BENTOMOS 23

STANDARDS, SPECIFICATIONS:
DIN 51 502: KF2S-10
ISO 6743-9: BDEB-2

GENERAL DESCRIPTION:
BENTOMOS 23 high temperature grease made through the process of thickening highly refined mineral oils with kinematic viscosity 150mm²/s at 40°C with bentonite. BENTOMOS 23 contains molybdenum disulfide with the grain size less than 5µm. BENTOMOS 23 is infusible and water resistant.

APPLICATIONS:
BENTOMOS 23 is applied to lubricate rolling and slide bearings and other friction surfaces with constant working temperature above 100°C, mainly in the range of 120-200°C, and if appropriately frequently exchanged or refilled even up to ca. 220°C.
It is recommended to be used at high and especially impact loads. It is not suitable to lubricate low toque driven bearings and small lateral clearance bearings.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
NLGI class		2
dropping point	°C	290
worked penetration at 25°C	mm/10	295
mechanical stability micro-penetration after 4h rolling at 60°C	%	176
structural stability: oil separation from grease	% (m/m)	6.0
weld load	kG	315
base oil viscosity (mineral oil) at 40°C	mm²/s	150

BENTOR 2

STANDARDS, SPECIFICATIONS:
DIN 51 502: K2S-10
ISO 6743-9: ACEB-2

GENERAL DESCRIPTION:
BENTOR 2 high temperature grease is made of highly refined, highly viscous mineral oil (oil viscosity at 40°C ca. 150 mm²/s) and bentonite thickener. BENTOR 2 grease is water resistant and generally infusible. It preserves plastic properties up to the temperature of - 10°C.

APPLICATIONS:
BENTOR 2 is applied to lubricate rolling and slide bearings and other friction surfaces with constant working temperature between 120°C and 200°C. It is not suitable for lubricating bearings driven at low torque and bearings with small lateral play.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES
NLGI class		2
worked penetration at 25°C	mm/10	295
dropping point	°C	290
mechanical stability micro-penetration after 4h rolling at 60°C	%	172
structural stability: oil separation from grease	% (m/m)	6.0
weld load	kG	160
base oil viscosity (mineral oil) at 40°C	mm²/s	150

BIODEGRADABLE GREASE

UNITEX 00, 1

STANDARDS, SPECIFICATIONS:
Unitex 00:
DIN 51 502:MP00G-30
ISO 6743-9: CBEA-00
Unitex 1:
DIN 51 502: MP1G-30
ISO 6743-9: CBEA-1

GENERAL DESCRIPTION:
Biodegradable UNITEX grease is made of a mixture of synthetic ester oil and vegetable oil, calcium thickener and enriching additives with the consistence class of NLGI: 00 and 1. This grease is characterised by very good operating properties, such as resistance to water, low resistance to pressing through low diameter ducts (which is particularly important in winter), reducing noise made by trams in rail curves. UNITEX grease biodegradability is ca. 90 % (CEC L-33-A-93 method).

APPLICATIONS:
UNITEX biodegradable grease is intended for total loss lubrication of railway and tram traction, as well as machines and equipment used in forests, water intakes, etc. where there is the potential danger of environment contamination.

PHYSICAL AND CHEMICAL PROPERTIES:

PARAMETERS	UNITS	TYPICAL VALUES	
		UNITEX 00	UNITEX 1
NLGI class		00	1
worked penetration at 25°C	mm/10	429	321
dropping point	°C	150	150
corrosive action on copper plates, 100°C/3h	-	no corrosion	no corrosion
lubricating properties on a four ball pressure tester, weld load	kG	200	

ACETONE

GENERAL DESCRIPTION:
Acetone is a perfect solvent of numerous organic substances, especially fats, oils, resins and nitrocellulose. Acetone is used in refinery industry for selective oil refining, in papermaking and pharmaceutical industry, to manufacture auxiliary products for rubber industry, in paint and varnish industry and to manufacture chemical reagents. It is also used for organic synthesis in chloroform and isopropyl alcohol production.

PHARMACEUTICAL PETROL

GENERAL DESCRIPTION:
Pharmaceutical petrol is a mixture of saturated aliphatic hydrocarbons with the number of coal atoms of C6 and C7. It is made through catalytic hydrogenation and rectification of non-aromatic residue of aroma extraction. Pharmaceutical petrol is mainly used as a solvent in medicine, pharmaceutical industry, plastics processing and electronics.

III LOW AROMATIC EXTRACTION NAPHTHA

GENERAL DESCRIPTION:
III low-aromatic extraction naphtha is a mixture of saturated aliphatic hydrocarbons, aromatic hydrocarbons (up to 2.5%) and insignificant quantities of unsaturated hydrocarbons (up to 1.5%). III low-aromatic extraction naphtha is made through conservative processing of oil. It is used mainly as a solvent in rubber and dyeing industry and for degreasing in metal industry as well as for manufacturing of some adhesives.

PAINTER'S NAPHTHA

GENERAL DESCRIPTION:
Painter's naphtha is a mixture of aliphatic and aromatic hydrocarbons. It is made through conservative and destructive processing of oil with application of hydrorefining and rectification processes. Painter's naphtha is mainly used as a solvent and a thinner of phtalic, oil and asphalt paints.

EXTRACTION THINNER

GENERAL DESCRIPTION:
A mixture of extraction naphtha and xylene. It is broadly used to degrease surfaces which are to be painted, dilute fats, oil and wax, to clean elements, tools and for dry cleaning in chemical laundries.

BROAD HEXANE FRACTION

GENERAL DESCRIPTION:
A mixture of hydrocarbons, mainly C6 containing n-paraffin, i-paraffin, olefins and naphthenes. It is applied as a solvent and a thinner in medicine, pharmaceutical industry, plastic processing and electronics. Its properties are similar to those of pharmaceutical petrol.

SOLVENTS AND KEROSENE

DENATURATED ALCOHOL

GENERAL DESCRIPTION:
Fully contaminated ethyl alcohol. Application French polish solvent, alcohol-fired cookers, window washing, disinfecting agent.

LIGHTING KEROSENE

GENERAL DESCRIPTION:
Mixture of hydrocarbons obtained through refining a adequate oil distillates. Lightning kerosene which also can be used as remover of fats and greases from metallic surfaces.

CLEANING KEROSENE

GENERAL DESCRIPTION:
Light oil distillates chemically neutralised. Used for e.g. cleaning and preservation of metallic elements.

POWER SERVICE
professional oil service

ORLEN OIL

PROFESSIONAL OIL SERVICE – POWER SERVICE

ORLEN OIL is one of the first oil industry companies on the Polish market that have introduced a comprehensive offer of services for industrial enterprises which utilize lubricants in production processes.

Professional oil service – POWER SERVICE is a wide range of services provided directly on Users' premises. Delegating an enterprise's management of lubricants to professionals is a decision bringing numerous benefits to the Client. The profits following from lowering exploitation costs related to lubricants management or eliminating logistics and storage issues are only some of many.

The greatest benefit is enhancing reliability of machinery and devices, which results directly in reducing the costs following from unplanned breaks in production and downtime. POWER SERVICE also brings benefits related to the optimisation of lubricants consumption.

POWER SERVICE offer is divided into three principal fields of operation.

» servicing industrial oil systems,
» application of technological oils and servicing cutting oil systems for metal working,
» oil monitoring.

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