PUMA LUBRICANTS

PRODUCT CATALOGUE

AFRICA

Product Catalogue

Puma lubricants are designed in Switzerland using the highest quality components available on the market. Premium quality base oil Group I, II, III and synthetic fluids whichever suits best for the application and operating conditions. In conjunction with the latest, state-of-the-art additive technologies, Puma lubricants outperform conventional lubricants specifically in the most severe applications i.e. mining, cement industry, transport and construction equipment, sugar industry, power generation and many other industries.

Puma lubricants are inspiring change with its innovative manufacturing process by creating base oils of the highest quality and exceeding the customers' expectations.

Our additives have a complete range of lubricants with the highest quality in monograde, multigrade, semi-synthetic and synthetic mineral oils for high performance uses. Our lubricants surpass most automotive and industrial specifications and are approved by leading Original Equipment Manufacturers.

Our High-performance additives ensure long-lasting functionality capabilities both in extreme temperatures, extreme pressure, and chemical exposure eliminating the risk of failures to ensure end-user satisfaction.

We inspire with quality, trust, and personalized attention.

Heavy Duty Diesel Engine Oils

Heavy Duty Diesel Engine Oils (HDDEO)

The world is focussed on reducing emissions and improving fuel economy. The Industry Bodies and OEM's are reacting to this by moving/ updating their hardware and specifications.

Heavy duty vehicles, on-road and off-road, changed significantly over the last 30 years.

1. Increased Engine Power Density
2. Hardware material changes
3. Evolution of Aftertreatment Systems
4. Extended Oil Drain Intervals
5. Challenges of Off-Road and On-Road

This means that the oil must be compatible with new materials e.g. lead-free bearings, steel pistons. The oil is exposed to higher thermal loads which require increased oxidation stability, better deposit and sludge control.
The need for improved fuel economy requires to the use of lower viscosity engine oil but at the same time the lubricating properties had to be improved and oil volatility significantly reduced.

Engine oil has to deliver more in piston cleanliness, thermal and oxidation control over a longer oil drain interval with limitations on key active components (wear protection additives).

Besides the aftertreatment systems installed, internal hardware changes as increased turbocharger pressures, raised top piston ring and retarded injection all contribute significantly to the increased thermal impact on the engine oil.

In conjunction with a varying fuel quality, especially on Sulphur content, to operate on-road and off-road heavy-duty vehicles is a challenge and needs engine oils which can cope with the modern engine designs operating in a less favourable environment.

Puma Energy wants our customers to know we are keeping up with these latest developments and that we have the solutions they need for their equipment from the past, today and in the future.

Puma HD Ultra S 15W-40

Heavy Duty Diesel Engine Oil

Description

Latest Technology Diesel Engine Oil
Puma HD Ultra S 15W-40 is a new generation CK-4 lubricant that has been designed to meet the requirements of the latest technology engines designed to meet the lower Greenhouse Gas Emission requirements of 2017 model engines. These engines are fitted with Exhaust Gas Recirculation (EGR), Diesel filter Particles (DPF) and Selective Catalytic Reduction systems (SCR) present in the 2017 models and later. It is also suitable for pre-2017 equipment.
The modern engine technology requires Ultra Low Sulphur Content fuels (max.15 ppm) Sulphur is required.

Usages

Puma Ultra S has been formulated with highly refined base oils and advanced technology additives to provide superior performance than predecessor technologies. Providing more wear control on valve trains, effective handling of soot, reduced oil consumption, better protection for the piston rings and superior control of piston deposits which significantly improve operation and engine durability.

Anti-wear Protection, Oxidation Resistance, Anti-foam Performance

Specifications

Licensed/ Approved

API CK-4/SN
Volvo VDS- 4.5
Cummins CES-20086
Mack EOS 4.5
DDC 93K-222

Meets:

ACEA E9
API CJ-4, CI-4 Plus, CI-4, CH-4/SM
Caterpillar ECF-3
FORD WSS-W2C171-F1
MAN M-3575
Deutz DQC III-10 LA
MTU Type 2.1

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma HD Ultra S
Viscosity Grade		SAE	J300	15W-40
Kinematic Viscosity	40°C	cSt	ASTM D-445	128.8
Kinematic Viscosity	100°C	cSt	ASTM D-445	15.95
Viscosity CCS	-15 C	mPa.s	ASTM D-5293	6131
Viscosity Index	-	-	ASTM D-2270	131
Density	15°C	g/ml	ASTM D-4052	0.873
Total Base No	-	mg KOH/g	ASTM D-2896	9.2
Sulphated Ash	-	%	ASTM D-874	0.86
Flash Point (COC)	-	°C	ASTM D-92	237
Pour Point	-	°C	ASTM D-97	-39
Pour Point	-	°C	ASTM D-97	-33

These characteristics are typical of current product methods whilst future production will conform to Puma Lubricants specifications, variations in these physical characteristics may occur. Please request the Technical Data Sheet for more detailed information.

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Automotive

Puma HD Plus 15W-40

Heavy Duty Diesel Engine Oil

Description

Puma HD Plus 15W-40 diesel engine oil is a high-quality multi-grade long drain lubricating oil, exceeding the specifications of API CI-4+. Puma HD Plus 15W-40 is specially developed for use in all types of high output normally-aspirated and turbocharged diesel engines with EGR (Exhaust Gas Recirculation) operating under very severe duty or which are subject to deposit formation or excessive wear due to design characteristics and high soot loads (idling).

Usages

Puma HD Plus has been designed for those diesel engines working under severe operating conditions requiring an API CI-4+ engine oil or where the better soot handling may be of benefit. For naturally aspirated, turbo charged and EGR engines in trailer trucks, dump trucks, urban and highway passenger buses and diesel engines in industrial and construction equipment.

Anti-wear Protection, Superb Soot Handling, Reduced Oxidation Thickening

Specifications

Licensed/ Approved

API CI-4+ /SL
Volvo VDS- 3
Cummins CES-20077/ 78
Detroit Diesel DFS-93K214 Mack
EO-N
Renault VI RLD-2

Meets:

API CI-4+ /SL
Volvo VDS- 3
Cummins CES-20077/ 78
Detroit Diesel DFS-93K214 Mack
EO-N
Renault VI RLD-2

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma HD Plus
Viscosity Grade		SAE	J300	15W-40
Kinematic Viscosity	40°C	cSt	ASTM D-445	123
Kinematic Viscosity	100°C	cSt	ASTM D-445	15.5
Viscosity CCS (15 W)	-15 C	mPa.s	ASTM D-5293	5,000
Viscosity Index	-	-	ASTM D-2270	132
Density	15°C	g/ml	ASTM D-4052	0.873
Total Base No	-	mg KOH/g	ASTM D-2896	11.3
Sulphated Ash	-	%	ASTM D-874	1.3
Flash Point (COC)	-	°C	ASTM D-92	225
Pour Point	-	°C	ASTM D-97	-36

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Puma HD Extra 10W-40

Heavy Duty Diesel Engine Oil

Description

Semi-Synthetic Diesel Engine Oil
Puma HD Extra 10W-40 is a high-quality multi-grade lubricating oil, primarily manufactured from Group II & III base oils. Specially developed for use in all types of high output normally-aspirated and supercharged diesel engines operating under very severe duty or which are subject to deposit formation or excessive wear due to design characteristics or to the fuel employed.
Extended Drain

Usages

Puma HD Extra is formulated from selected base stocks with high Viscosity Index and Low Pour Point. The oil is treated with a large percentage of additives to impart superior detergency together with high dispersant, anti-oxidant, anti-corrosion, anti-wear and anti-foam properties. Extended Drain heavy duty diesel engine oil formal MB 228.5 approved.

Anti-wear Protection, Superb Soot Handling, Oxidation Resistance

Specifications

Licensed/ Approved

Approved acc. MB 228.5 (extended drain)
API CI-4
Volvo VDS- 3
Cummins CES-20076/ 77/ 78
Detroit Diesel DFS-93K214
Mack EO-M

Meets:

ACEA E4/ E7
JASO DH-1
Caterpillar ECF-1A, ECF-2, Global DHD-1
MTU DDC T3
Deutz DQC-III-10
MAN M3277
Renault VI RLD-2

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma HD Extra
Viscosity Grade		SAE	J300	10W-40
Kinematic Viscosity	40°C	cSt	ASTM D-445	102
Kinematic Viscosity	100°C	cSt	ASTM D-445	14.6
Viscosity CCS	-20 C	mPa.s	ASTM D-5293	6,045
Viscosity Index	-	-	ASTM D-2270	140
Density	20°C	g/ml	ASTM D-1250	0.86
Total Base No	-	mg KOH/g	ASTM D-2896	12.6
Sulphated Ash	-	%	ASTM D-874	1.7
Flash Point (COC)	-	°C	ASTM D-92	230
Pour Point	-	°C	ASTM D-97	-36

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Automotive

Puma HD Super S 15W-40

Heavy Duty Diesel Engine Oil

Description

Puma HD Super S diesel engine oil is a high-quality multi-grade long drain lubricating oil, exceeding the specifications of API CI-4. Puma HD Super S is specially developed for use in all types of high output normally-aspirated and turbocharged diesel engines operating under very severe duty or which are subject to deposit formation or excessive wear. The specific technology used imparts superior detergency. Puma HD Super S can also be used in engines requiring quality levels API CG-4, CH-4, CF and CF-4.

Usages

Puma HD Super S has been designed for those diesel engines working under severe operating conditions requiring an API CI-4 engine oil or where the better soot handling is of benefit. For naturally aspirated, turbo charged and EGR engines in trailer trucks, dump trucks, urban and highway passenger buses and diesel engines in industrial and construction equipment.

Oxidation Resistant, Anti-Wear Protection, Anti-Foam Performance

Specifications

Licensed/ Approved

API CI-4/SL
Cummins CES-20077/78
Volvo VDS-3
Deutz DQC III-05
Mack EO-N
Renault VI RLD-2

Meets:

ACEA E7, A3/B4
API CH-4, CF-4, CG-4, CF/SJ
Caterpillar ECF-1A, ECF-2, Global DND-1
MAN 3275-1

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma HD Super S
Viscosity Grade		SAE	J-300	15W-40
API Specification				CI-4/ SL
Kinematic Viscosity	40°C	cSt	ASTM D-445	116.7
Kinematic Viscosity	100°C	cSt	ASTM D-445	15.5
Viscosity Index			ASTM D-2270	142
Viscosity CCS (15 W)	-20 °C	mPa.s	ASTM D-5293	6100
Low Temperature Pumping	-25 °C	mPas	ASTM D-4684	19,200
Density	15°C	g/ml	ASTM D-4052	0.884
Total Base No	-	mg KOH/g	ASTM D-2896	11
Sulphated Ash	-	%	ASTM D-874	1.3
Flash Point (COC)	-	°C	ASTM D-92	230
Pour Point	-	°C	ASTM D-97	-33

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Puma HD Super 15W-40

Heavy Duty Diesel Engine Oil

Description

Puma HD Super is a high-quality lubricating oil specially developed for use in all types of high output normally-aspirated and turbocharged diesel engines operating under very severe duty or which are subject to deposit formation or excessive wear due to design characteristics or to the fuel employed. The oil is formulated from selected base stocks with high viscosity index. The oil is treated with a large percentage of additives to impart superior detergency together with high dispersant, anti-oxidant, anti-corrosion, anti-wear and anti-foam properties.

Usages

Puma HD Super 15W-40 has been re-formulated to meet the API CH-4 specifications providing improved oxidation control, better soot handling and improved dispersancy. However, above all improved cylinder and valve train wear protection

Improved Oxidation Control, Improved Soot Handling, Improved Dispersancy, Improved Cylinder and Valve Train Wear Protection

Specifications

Licensed/ Approved

API CH-4/SJ
Cummins CES-20077
Deutz DQC III & II
Mack EO-M

Meets:

Caterpillar ECF-1A
MAN 3275
MB 228.3
MTU 2.0

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma HD Super
Viscosity Grade		SAE	J-300	15W-40
API Specification				CH-4/ SJ
Kinematic Viscosity	40°C	cSt	ASTM D-445	128.8
Kinematic Viscosity	100°C	cSt	ASTM D-445	15.95
Viscosity Index			ASTM D-2270	135
Viscosity CCS (15 W)		mPa.s	ASTM D-5293	6240/ -20°C
Density	20°C	g/ml	ASTM D-1250	0.884
Total Base No	-	mg KOH/g	ASTM D-2896	10.5
Sulphated Ash	-	%	ASTM D-874	1.3
Flash Point (COC)	-	°C	ASTM D-92	230
Pour Point	-	°C	ASTM D-97	-33

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PASSENGER CAR MOTOR OILS (PCMO)

Passenger Car Motor Oils (PCMO)

The harsh operating conditions in Africa need to be considered with regard to the proper oil selection:

1. Severe environmental impacts e.g. dust & sand, extreme temperature variance accelerate piston wear and bore polishing.
2. Demanding fuel quality e.g. high sulphur content, non-additised fuel will accelerate engine sludge build up.
3. Challenging driving conditions e.g. high traffic density in cities, start-stop, many unpaved roads accelerate oil oxidation.
4. Average vehicle age e.g. Africa is the largest market for second hand vehicles hence worn engines are obvious.

In the years to come, the engine oil specifications/ requirements will move. The obsolete API specifications and monograde motor oils will decline and even disappear. The API SL will become the dominant specification whereby the viscosity grades 15W-40 will grow and 20W-50 will keep its share. However, API SM and SN will grow fast.

Newer cars will require much higher motor oil performance even up to the latest API and ACEA specifications to provide optimum engine protection, emission treatment devices compatibility, fuel economy, long oil drain interval, prevent Low Speed Pre-Ignition (LSPI) damages as observed in turbo charged direct injection gasoline/ petrol engines.
API SP specified motor oils are already available at Puma Energy on request.

Growth is expected for smaller cars (<2000 cc) due to rising costs of maintenance and fuel.

Puma Energy wants our customers to know we are keeping up with these latest developments and that we have the solutions they need for their equipment from the past, today and in the future.

Scan to access our Lube Finder

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Automotive

Puma Advanced Series

Fully Synthetic Engine Oils

Description

Puma Fully Synthetic, mid SAPS, Engine Oils for petrol and diesel engines are specially designed for the most recent vehicles equipped with engines that comply with the EURO IV; EURO V anti-pollution regulation of low phosphorous, sulphur and sulphated ashes.

Usages

Designed to provide an exceptional cleaning power, wear protection and overall performance. It maintains the efficiency of emission systems for Diesel and Gasoline cars. Formulated to be fully compatible with catalytic converters for gasoline engines (CAT)

Outstanding Anti-wear Protection, Unsurpassed Oxidation Resistance, Resource Conserving Fuel Economy

Typical characteristics of the product

Property	Temp	Units	Test Methods	Advanced Series				
Viscosity Grade		SAE	J-300	0W-20	0W-40	5W-20	5W-30	5W-40
Kinematic Viscosity	40°C	mm2/s (cSt)	ASTM D-445	39	82.2	40.2	54	86.5
Kinematic Viscosity	100°C	mm2/s (cSt)	ASTM D-445	7.4	13.8	7.4	10.9	14
HTHS	150 °C	mPa.s	ASTM D-5481		≥ 3.5		3.65	≥ 3.5
Viscosity Index			ASTM D-4292	161	165	154	160	167
Viscosity CCS	mPa.s (cP)		ASTM D-5293	6200/-35°C	6200/-35°C	6200/-35°C	6200/-30°C	6200/-30°C
Total Base Number		mg KOH/g	ASTM D-2896	7.8	7.5	7.8	6	7.5
Sulphated Ash		%	ASTM D-874	0.8	0.8	0.8	0.8	0.8
Flash Point (COC)		°C	ASTM D-92	228	220	231	233	233
Pour Point		°C	ASTM D-97	-49	-39	-33	-40	-36

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Puma GT Plus 5W-40

Fully Synthetic Engine Oils

Description

Puma Fully Synthetic mid SAPS Engine Oil for petrol and diesel engines is specially designed for the most recent vehicles equipped with engines that comply with the EURO IV; EURO V anti-pollution regulation of low phosphorous, sulphur and sulphated ashes.

Usages

Designed to provide an exceptional cleaning power, wear protection and overall performance. It maintains the efficiency of emission systems for Diesel and Gasoline cars. Formulated to be fully compatible with catalytic converters for gasoline engines (CAT)

Outstanding Anti-wear Protection, Unsurpassed Oxidation Resistance, Resource Conserving

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma HD Super
Viscosity Grade		SAE	J300	5W-40
Kinematic Viscosity	40°C	cSt	ASTM D-445	80
Kinematic Viscosity	100°C	cSt	ASTM D-445	13
Viscosity CCS	-30°C	mPa.s (cP)	ASTM D-5293	5800
Viscosity Index			ASTM D-4292	170
Flash Point (COC)		°C	ASTM D-92	230
Pour Point		°C	ASTM D-97	-48

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Puma Extra Series

Semi-Synthetic Engine Oils

Description

Puma Semi-Synthetic Engine Oils for petrol and diesel engines are high quality multi-grade long drain lubricating oils. These oils provide increased engine protection through increased oxidation resistance. Primarily developed for high performance petrol engine.

Usages

These oils are formulated from selected base stocks both Group II & III with high Viscosity Index and Low Pour Point. These oils are treated with a large percentage of additives to impart superior detergency together with high dispersant, anti-oxidant, anti-corrosion, anti-wear and anti-foam properties.

Anti-wear Protection, Oxidation Resistance, Resource Conserving Fuel Economy

Typical characteristics of the product

Property	Temp	Units	Test Methods	Extra Series				
Viscosity Grade		SAE	J-300	5W-20	5W-30	5W-40	10W-30	10W-40
Kinematic Viscosity	40°C	mm2/s (cSt)	ASTM D-445	47.9	66.8	86.5	62.7	94.7
Kinematic Viscosity	100°C	mm2/s (cSt)	ASTM D-445	8.3	11.1	13.5	9.9	14.4
Viscosity CCS		mPa.s (cP)	ASTM D-5293	5450/ -30°C	6080/ -30°C	6080/ -25°C	6000/ -25°C	6000/ -25°C
Viscosity Index			ASTM D-4292	149	160	160	152	158
Flash Point (COC)		°C	ASTM D-92	232	231	230	234	237
Pour Point		°C	ASTM D-97	-42	-42	-42	-39	-39
Total Base Number		mgKOH/g	ASTM D-2896	7.8	7.8	7.3	7.8	7.8
Sulphated Ash		%	ASTM D-874	0.85	0.85	0.85	0.85	0.85

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Puma Super 20W-50

Heavy Duty Gasoline & Diesel Engine Oil

Description

Puma Multi-Grade Motor Oils are high quality lubricating oils specially developed for use in all types of for high output normally-aspirated and supercharged gasoline / diesel engines operating under very severe duty.

Usages

Puma Super 20W-50 provides reliable protection for older, higher mileage engines. These oils are treated with a large percentage of additives to impart superior detergency together with high dispersant, anti-oxidant, anti-corrosion, anti-wear and anti-foam properties.

Anti-wear Protection, Oxidation Resistance, Anti-Foam Performance

Typical characteristics of the product

Property	Temp	Units	Method	Puma Basic 40
API Specification				SL/CF
Viscosity Grade		SAE	J300	20W-50
Kinematic Viscosity	40°C	mm2/s (cSt)	ASTM D-445	177
Kinematic Viscosity	100°C	mm2/s (cSt)	ASTM D-445	18.5
Viscosity Index			ASTM D-4292	110
Viscosity CCS	-15°C	mPa.s (cP)	ASTM D-5293	9500
Flash Point (COC)		°C	ASTM D-92	230
Pour Point		°C	ASTM D-97	-18
Density	15°C	kg/L	ISO 12185	0.8829

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PUMA Basic 40 & 50

Basic Monograde Diesel & Petrol Engine Oils

Description

Puma Basic Monograde Engine Oils are high quality lubricating oils specially developed for use in all types of petrol and diesel engines operating under very severe duty or which are subject to deposit formation or excessive wear due to design characteristics or to the fuel employed.

Usages

Puma Basic 40 & 50 provide good detergency together with high dispersant, anti-oxidant, anti-corrosion, anti-wear and anti-foam properties.

Anti-wear Protection, Oxidation Resistance, Anti-Foam Performance

Typical characteristics of the product

Property	Temp	Units	Method	Puma Basic 40	Puma Basic 50
Viscosity grade		SAE		40	50
Kinematic Viscosity	40°C	mm2/s (cSt)	ISO 3104	141.6	202.4
Kinematic Viscosity	100°C	mm2/s (cSt)	ISO 3104	14.8	18.7
Viscosity Index			ISO 2909	104	103
TBN		mgKOH/g	ISO 3771	8.2	8.3
Flashpoint COC		°C	ISO 2592	>220	>240
Pourpoint		°C	ISO 3016	-33	-27
Density	20.0°C	g/cm3	ISO 12185	0.8829	0.8783
API Specification				CF-4/ SJ	CF-4/SJ
				CG-4/SJ	CG-4/SJ
				CF/SJ	CF/ SJ

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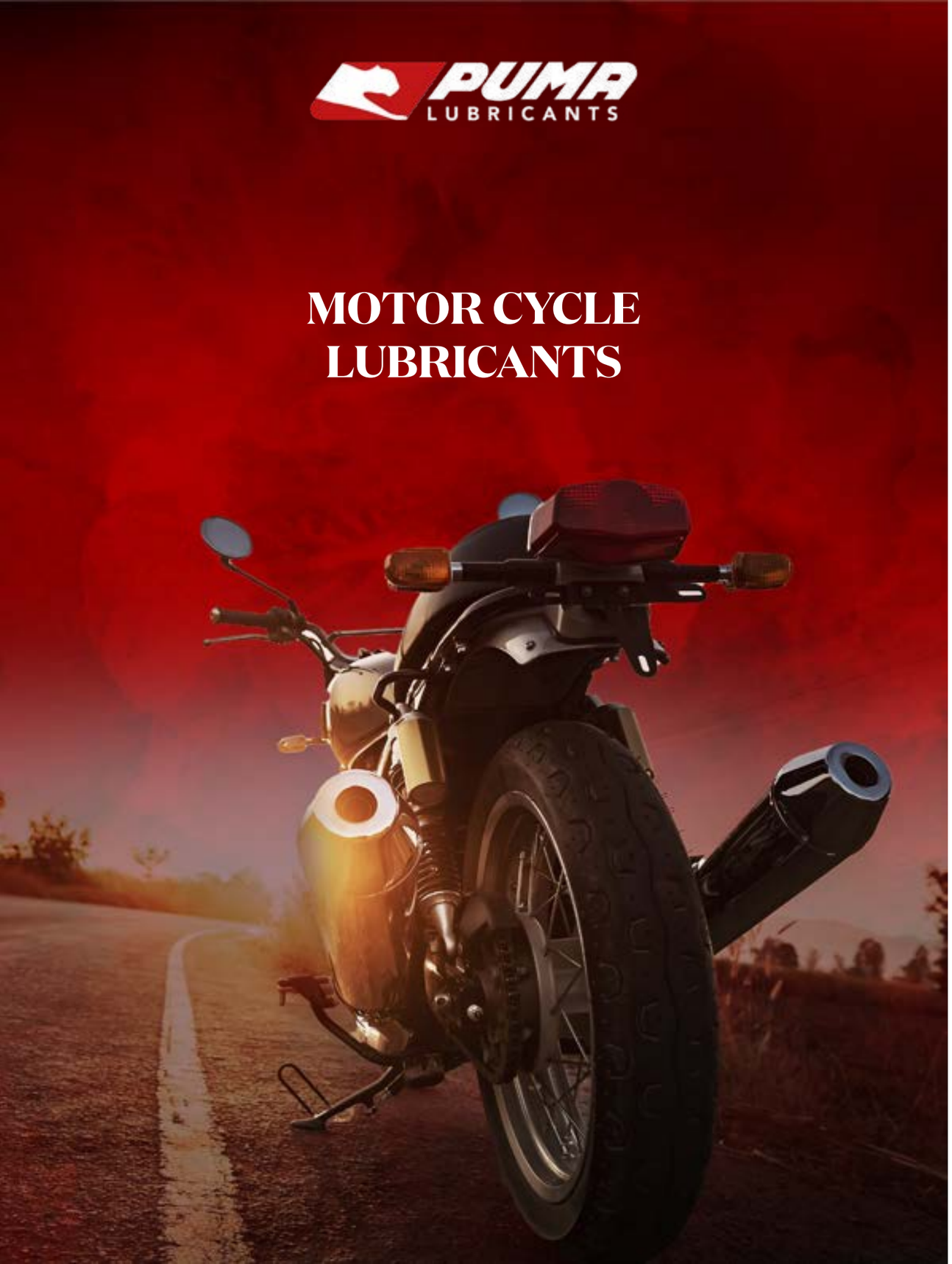

Motor Cycle Oil (MCO)

In Africa motorcycles are a convenient critical form of transport for many individuals, families and specifically businesses.

The first intent passenger car oils designed for low friction to enable fuel economy will not work well in motor cycle applications.
Only oils designed as first intent for motor cycles can meet the full demands of a motorcycle.

The majority of motorcycles use a wet clutch design which has to be lubricated with the same oil as the engine and gears. Therefor motorcycle lubricants need to deliver controlled friction levels under different riding conditions, not simply low friction.
The key challenge is to provide consistent protection of the engine, clutch and transmission while managing high engine rpm's with small amount of oil.

Puma Energy technology motorcycle oil can deliver end user benefits from:

- Up to 2% improvement in both power and torque just from changing the oil
- Higher torque means more power/ acceleration at the same engine rpm
- Higher torque allows higher load capability
- Overtaking manoeuvres can be carried out more swiftly and safely
- Acceleration physically visible in stop-start conditions and traffic-light situations

End users can feel and see the improvement

Puma Energy wants our customers to know we are keeping up with these latest developments and that we have the solutions they need for their equipment from the past, today and in the future.

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Puma Revolution

Motor Cycle Oils

Description

Fully Synthetic 4-Stroke Motorcycle Oils

PUMA Revolution are advanced fully synthetic high performance multigrade lubricants especially developed for four-stroke motorcycles. It increases engine acceleration and power and flows quickly to all metal parts to reduce engine friction, even under the most severe driving conditions.

Usages

Formulated with synthetic base oils and an additive package for providing exceptional engine cleanliness, excellent wear protection at high temperature and exceptional protection against corrosion.

Engine, Gears & Clutch Protection, Oxidation Resistance, High Detergency Clean Engine

Specifications

Meets:

API SN
JASO MA2
JASO T903 (Motor Cycles Four
Stroke Engine Oil)

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma Revolution	
Viscosity Grade		SAE	J300	10W-40	15W-50
Density	20°C	g/ml	ASTM D-1250	0.8542	0.8577
Kinematic Viscosity	40°C	mm2/s (cSt)	ASTM D-445	95.44	142.1
Kinematic Viscosity	100°C	mm2/s (cSt)	ASTM D-445	14.62	19.6
Viscosity Index			ASTM D-2270	159	158
Total Base Number		mgKOH/g	ASTM D-2896	9.2	8.2
Flashpoint (COC)		°C	ASTM D-92	234	248
Pourpoint		°C	ASTM D-97	-39	-27

These characteristics are typical of current product methods whilst future production will conform to Puma Lubricants specifications, variations in these physical characteristics may occur. Please request the Technical Data Sheet for more detailed information.

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Motorcycle Lubricants

Puma Adventure

Motor Cycle Oil

Description

Fully Synthetic 4-Stroke Motorcycle Oils

PUMA Adventure is an advanced semisynthetic lubricant; its exclusive formulation provides excellent flow characteristics to reduce wear during start-up and provide outstanding protection to the transmission and clutch during operation.

Usages

Its viscosity grade SAE 10W-30 helps the engine to work at a higher level of efficiency. It is a high-performance oil for four-stroke motorcycles that helps keep the engine in optimal conditions of efficiency. Also, its excellent detergent and dispersant properties inhibit the formation of carbon as well as its anti-wear power, which allows savings in maintenance costs and excellent efficiency in the development of the power.

Engine, Gears & Clutch Protection, Oxidation Resistance, High Detergency Clean Engine

Specifications

Meets:

API SN
JASO MA2
JASO T903 (Motor Cycles Four
Stroke Engine Oil)

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma Adventure
Viscosity Grade		SAE	J300	10W-30
Density	20°C	g/ml	ASTM D-1250	0.8623
Kinematic Viscosity	40°C	mm2/s (cSt)	ASTM D-445	60.83
Kinematic Viscosity	100°C	mm2/s (cSt)	ASTM D-445	9.835
Viscosity Index			ASTM D-2270	147
Total Base Number (TBN)		mgKOH/g	ASTM D-2896	8.6
Flashpoint (COC)		°C	ASTM D-92	213
Pourpoint		°C	ASTM D-97	-36

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Puma Urban

Motor Cycle Oil

Description

4-Stroke Motorcycle Oil

PUMA Urban is a high-performance mineral lubricant for four-stroke motorcycles that increases acceleration and power in the engine, made with highly refined basic and a package of additives that provide properties to keep the machines in optimal conditions of efficiency, also its excellent detergent and dispersant properties inhibit the formation of carbon as well as its anti-wear power, which allows savings in maintenance costs and an efficiency in the development of the power.

Usages

PUMA Urban is a lubricant specially designed for four-stroke motorcycles engines where the lubrication must be performed simultaneously to the engine and the transmission Four-stroke air-cooled motorcycles that require any of the API and JASO specifications can be used on all engines, according to the recommendations of motorcycle manufacturers. Presents
present great resistance to the shear stress that exists in the gears of the transmission and the wet clutch of the motorcycles. Meets or exceeds the JASO MA2 performance standard more recent.

Engine, Gears & Clutch Protection, Oxidation Resistance, High Detergency Clean Engine

Specifications

Meets:

API SN
JASO MA2
JASO T903 (Motor Cycles Four Stroke Engine Oil)

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma Urban
Viscosity Grade		SAE	J300	20W-50
Density	20°C	g/ml	ASTM D-1250	0.877
Kinematic Viscosity	40°C	mm2/s (cSt)	ASTM D-445	169.4
Kinematic Viscosity	100°C	mm2/s (cSt)	ASTM D-445	18.69
Viscosity Index			ASTM D-2270	120
Total Base Number (TBN)		mgKOH/g	ASTM D-2896	9.1
Flashpoint (COC)		°C	ASTM D-92	235
Pourpoint		°C	ASTM D-97	-27

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Motorcycle Lubricants

Puma 2T

Motor Cycle Oil

Description

2-Stroke Motorcycle Oil

Puma 2 Stroke Motorbike Oil is a lubricant for use in gasoline-oil (petrol) mixtures employed in air-cooled and water-cooled two-stroke engines of scooters, mopeds and small agricultural implements as well as accessories. It is formulated with selected components and is perfectly compatible for mixing with all unleaded gasolines.

Usages

Puma 2T meets the requirements of API TA/ TB

Anti-wear Protection, Oxidation Resistance, 2 Stroke

Typical characteristics of the product

Property	Temp	Units	Test Methods	2 Stroke
Kinematic Viscosity	40°C	mm2/s (cSt)	ASTM D-445	107
Kinematic Viscosity	100°C	mm2/s (cSt)	ASTM D-445	11.9
Viscosity Index			ASTM D-4292	100
Flash Point (COC)		°C	ASTM D-92	150
Pour Point		°C	ASTM D-97	-24
Density	15 °C	kg/l	ASTM D-4052	0.88

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Transmissions

Transmission design is focussed on improving durability and strength while reducing weight at the same time. Transfer more power while also considering fuel efficiency.

The trend in manual transmissions (MT) clearly call for improved fuel efficiency, extended drain intervals, rising torque on gears and load on bearings. The driver expects good and comfortable shift. New heavy-duty synchro materials (carbon) will aid durability. The integrated retarder brake system leads to higher temperatures. The 6-speed transmission in passenger cars leads to tighter design hence higher operating temperatures.
The transmission oils formulation will be focussed on lower viscosities for fuel efficiency & multi-cones, high thermal-oxidative stability, higher pitting protection and maintain stable and high coefficient of friction in synchronisers with new materials.

The design of Automatic transmission, step-type automatic Transmissions (AT), continuous variable transmissions (CVT), double clutch transmissions (DCT), Hybrid transmissions is as well focussed on improved fuel efficiency, more gear ratios, extended oil drain intervals and warrantee periods, factory fill fluids will be recommended for service fill and especially commercial vehicle ATs operate under higher temperatures.
The formulations of Automatic Transmission Fluids (ATFs) must provide lower viscosities for fuel efficiency, improved base oil and additive durability. More overlap between traditional solutions and market requirements for multi-vehicle ATF hence requirement for “me too” service fill fluids, different frictional requirements and higher oxidative and thermal stability.
These requirements call more for full synthetic and semi-synthetic transmission oils.

Puma Energy wants our customers to know we are keeping up with these latest developments and that we have the solutions they need for their equipment from the past, today and in the future.

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Puma UniSynth Trans 30 & 50

Transmissions

Description

High Performance Fully Synthetic Manual Transmission Oils

PUMA UniSynth Trans 30 & 50 are specially formulated fully synthetic lubricant designed for extended drain and severe service in heavy duty manual transmissions which require a non EP gear or transmission lubricant. It is recommended for On-Highway commercial light and heavy duty trucking, bus, and vans and also for Off-Highway industries including Construction, Mining and Agriculture.

Usages

PUMA UniSynth Trans 30 & 50 are recommended for the lubrication of heavy duty on- and off-highway manual transmissions which require a non EP gear or transmission lubricant. It is specially formulated to protect the higher torque manual transmissions coupled with the increased horsepower engines

Fully Synthetic, High Viscosity Index, Anti-Wear, Extended ODI

Specifications

Puma UniSynth Trans 30 meets:

API GL-4
DAF
MAN 341 Z4/E4ZF TE-ML several
IVECO
Renault
Voith Retarder Class C
Volvo 97307 (re-approval pending)

Puma UniSynth Trans 50 meets:

Puma UniSynth 50:
API GL-4/ MT-1
Meritor O76-E/ O94
MACK GO-J
MB 235.8
ZF TE-ML several
Volvo 97305

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma UniSynth Trans 30	Puma UniSynth Trans 50
SAE Grade			SAE J-300	30	50
SAE Grade			SAE J-306	75W-80	75W-90
Kinematic Viscosity	100°C	cSt	ASTM D-445	10.25	17
Kinematic Viscosity	40°C	cSt	ASTM D-445	65	132
Viscosity	-40°C	cP	ASTM D-2983	<150,000	<150,000
Viscosity Index	-	-	ASTM D-2270	144	146
Flash Point (COC)	-	°C	ASTM D-92	220	221
Pour Point	-	°C	ASTM D-97	-55	-45
Foam Test Sequence I			ASTM D-892	Pass	Pass
Foam Test Sequence II			ASTM D-892	Pass	Pass
Foam Test Sequence III			ASTM D-892	Pass	Pass
Density	15.6°C	g/ml	ASTM D-4052	0.861	0.860

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Puma Trans 80W-90

Heavy Duty Transmission Oil

Description

Puma Trans 80W-90 is an EP (Extreme Pressure) oil formulated for lubricating heavy duty manual transmissions axles and final drives requiring API GL-4 performance. Technology of raw materials used in the formulation of this lubricant allows complying with OEM requirements as IVECO, MAN, MB. Puma Trans 80W-90 also suitable for use in gear-boxes, final drives and power take-offs on farm and earth-moving machinery.

Usages

PUMA Trans 80W-90 provide outstanding gear protection, excellent anti scuffing properties, very high pitting resistance, exceptional low bearing wear in conjunction with good seal compatibility, antifoam properties and excellent copper and steel corrosion protection.

Anti-wear Protection, Oxidation Resistance, Anti-foam Performance

Specifications

Meets:

API GL-4
MAN 341 Type Z2
ZF TE-ML 02B, 08
MB 235.5
IVECO
EATON

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma Trans 80W-90
SAE Grade			SAE J-306	80W-90
			SAE J 300	40
Kinematic Viscosity	100°C	cSt	ASTM D-445	14.3
Kinematic Viscosity	40°C	cSt	ASTM D-445	132
Viscosity Index	-	-	ASTM D-4292	105
Flash Point (COC)	-	°C	ASTM D-92	>200
Pour Point	-	°C	ASTM D-97	-30
Density	15.6°C	g/ml	ASTM D-4052	0.900

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Puma ATF II & III

Automatic Transmission Fluids

Description

Puma ATF II & III are special fluids employed mainly in modern automatic transmissions and in many other applications where very low temperature performance, stability to mechanical loads and high viscosity Index are required.

Usages

Puma ATF II is specifically designed for filling and topping-up automatic transmissions built by makers who recommend the use of GM ATF II type products and for power steering

Puma ATF III is specifically designed for filling and topping-up automatic transmissions built by equipment manufacturers who recommend the use of GM ATF III type products, Ford Mercon, Allison C4 specifications and the European OEM requirements.

High Viscosity Index, Oxidation Resistance, Anti-foam Performance

Specifications

ATF II Meets:

GM Dexron IID
MB 236.1
Voith 55.6335
MAN 339 Type V-1, Z-1
ZF TE-ML 02F, 3D, 4D,14A, 17C
Allison C-4

ATF III Meets:

GM ATF III (G-34193)
Allison C-4
Allison TES-389
BMW
Ford Mercon
MAN 339 Type L1, L2, Z1, V1
Voith 55 6335
ZF TE-ML 4D, 14A,11 A/B, 09, 5L, 17C, 21L
Volvo CE 97340/4

Typical characteristics of the product

Property	Temp	Units	Test Methods	ATF II	ATF III
Kinematic Viscosity	100°C	cSt	ASTM D-445	7.6	7.5
Kinematic Viscosity	40°C	cSt	ASTM D-445	42	33.8
Viscosity	- 40°C	cP	ASTM D-2983	45,000	18,000
Viscosity Index	-	-	ASTM D-2270	183	195
Flash Point (COC)	-	°C	ASTM D-92	200	200
Pour Point	-	°C	ASTM D-97	-42	-42
Density	15°C	g/ml	ASTM D-4052	0.875	0.863
Colour				Red	Amber

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Transmissions

Puma Synthetic ATF

Fully Synthetic Automatic Transmission Fluids

Description

Puma Synthetic ATF is a fully synthetic POA (Poly-Alpha-Olefin) based product that outperforms conventional ATFs and helps to provide outstanding resistance to oil breakdown and deposits. The inherently high viscosity index and stability of Puma Synthetic ATF helps to protect against thermal breakdown at high operating temperatures, while still providing outstanding performance at ambient temperatures as low as -54 °C.

Usages

Puma Synthetic ATF is a multi-vehicle formula recommended for use in modern high performance automobiles, SUV's, SUT's, vans and other light trucks. Recommended for use in applications requiring Dexron III H & G , Ford Mercon and Mercon, Alisson TES 295/468 and Allison C-4

High Viscosity Index, Oxidation Resistance, Anti-foam Performance

Specifications

Meets:

Dexron IIIH, IIIG
Ford Mercon
Allison C-4
Allison TES 295/ 468
Caterpillar TO-2
M2C138-CJ
M2C166-H

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma Synthetic ATF
Kinematic Viscosity	-40°C	mPa.s	ASTM D-2983	10,000
Kinematic Viscosity	40°C	cSt	ASTM D-445	35.5
Kinematic Viscosity	100°C	cSt	ASTM D-445	7
Viscosity Index			ASTM D-4292	170
Flash Point (COC)		°C	ASTM D-92	220
Pour Point		°C	ASTM D-97	-51
Density	15 °C	kg/L	ASTM D-4052	0.84

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Puma CVT Oil

Fully Synthetic Continuous Variable Transmission Fluid

Description

Puma CVT Oil is a synthetic base oil product that outperforms conventional CVT oils and helps to provide outstanding resistance to oil breakdown and wear of gearboxes. The inherently high viscosity index and oil stability of Puma CVT Oil helps to protect against thermal breakdown at high operating temperatures, while still providing outstanding performance.

Usages

Patented technology designed to exceed performance requirements of all the major Asian OEM's.

Recommended for Continuous Variable Transmissions, Passenger Car Transmissions, Belt & Chain CVT's

High Viscosity Index, Oxidation Resistance, Anti-foam Performance

Specifications

Amongst Many More Meets:

JASO 1A
Toyota CVTF TC/ FE
Nissan NS-1, NS-2, NS-3
Honda HMMF 1, HCF 2
Mitsubishi SP-111, CVTF-J1
Subaru ECVT, I CVT
Daihatsu Ammix CVT
Suzuki CVT TC, NS-2
Hyundai SP-III
Chrysler Jeep NS-2
Mini Cooper EZL 799
And many more

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma Synthetic CVT
Kinematic Viscosity	-40°C	mPa.s	ASTM D-2983	10,000
Kinematic Viscosity	40°C	cSt	ASTM D-445	34
Kinematic Viscosity	100°C	cSt	ASTM D-445	7.2
Viscosity Index			ASTM D-4292	183
Flash Point (COC)		°C	ASTM D-92	200
Pour Point		°C	ASTM D-97	-48
Density	15 °C	kg/L	ASTM D-4052	0.85
Colour				Red

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Puma HD Drive Train Oils

Heavy Duty Drive Train & Hydraulic Oil

Description

Puma HD Drive Train Oils TO-4 Series are special lubricants suitable for use in mining equipment.
These oils are especially designed for Caterpillar and Komatsu equipment

Usages

Puma HD Drive Train Oils to be used for the lubrication of power shift, direct drive transmissions, final drives, differentials, winches, clutch plates.

Anti-wear Protection, Oxidation Resistance, Anti-foam Performance, Extreme Pressure

Specifications

Meets:

API GL-4
Caterpillar TO-4
Komatsu KES 07.868.1
Dana
Vickers M-2950-S
Eaton-Fuller
Euclid
Tremac/ TTC

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma HD Drive Train 10W	Puma HD Drive Train 30	Puma HD Drive Train 50	Puma HD Drive Train 60
SAE Grade			SAE J-306	10W	30	50	60
Internal Designation				TO 410	TO 430	TO 450	TO 460
Kinematic Viscosity	100°C	cSt	ASTM D-445	7.5	10.8	19.2	22.5
Kinematic Viscosity	40°C	cSt	ASTM D-445	48.3	83.5	209.5	270
Viscosity Index	-	-	ASTM D-4292	117	115	104	102
Flash Point (COC)	-	°C	ASTM D-92	200	210	>220	>220
Pour Point	-	°C	ASTM D-97	-21	-21	-18	-15
Density	15°C	g/ml	ASTM D-4052	0.885	0.900	0.910	0.915

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Puma Universal Tractor

Tractor Transmission Oil - UTTO

Description

Puma Universal Tractor Transmission Oil 10W-30 is a multi-purpose lubricant with special properties which make it suitable for use in modern tractors, where a single system is adopted for the lubrication of the gearbox, differential, oil-bath clutches, wet brakes, hydraulic systems, final drives and power take-off gearboxes.

Usages

UTTO

SAE 10W-30

SAE 80

Anti-wear Protection, Oxidation Resistance, Transmission Oil

Specifications

Amongst Many More Meets:

John Deere JDM-J20C
CNH MAT 3525/3526
API GL-4
Massey-Ferguson
M1135/41/43/45
Allison C-4
FORD ESEN M2C-134D
FORD ESEN M2C-86B
Eaton Vickers
Parker (Denison UTTO, HF-0)
Caterpillar : TO-2
Komatsu KES 07.866, AXO80
Kubota UDT
Case MS 1204/1206/1207/1209
JCMAS HK P-041 & HK P-042

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma Universal Tractor Transmission Oil
Viscosity Grade		SAE	J-300	10W-30
		SAE	J-306	80W
Kinematic Viscosity	40°C	mm2/s (cSt)	ASTM D-445	62
Kinematic Viscosity	100°C	mm2/s (cSt)	ASTM D-445	9.6
Viscosity Index			ASTM D-4292	138
Flash Point (COC)		°C	ASTM D-92	>220
Pour Point		°C	ASTM D-97	-45
Density	15 °C	kg/l	ASTM D-4052	0.8613

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AUTOMOTIVE GEAR OILS (AXLES)

Automotive Gear Oils (Axles)

The axle design focusses on 'power density' meaning maximum power capacity in smallest package available. The trend on axles also focusses on fuel efficiency, extended oil drain intervals, higher torque capacity and shock load protection on gears, higher power density and smaller sumps increasing the operating temperatures, reduced noise and vibration especially in limited slip differentials.
The gear formulations need to provide lower viscosities for fuel efficiency. Viscosity grades SAE 80W-80 and 85W-140 are being replaced by SAE 75W-90, 75W-85, 75W-80 and 75W-140.
High thermal-oxidation stability and excellent Extreme Pressure (EP) and Anti Wear (AW) protection are absolutely required. API GL-5 is no more sufficient, SAE J2360 and some critical OEM specifications need to be met as well as good compatibility with friction material in limited slip differentials.

Off-road axle, transmission and hydraulic oil are widely used in mining operations, construction sites and agriculture.
Wear to spur gears in the final drives is one of the biggest reported problems and costs in the field.
Excessive wear to friction plates is the biggest cause of transmission failure in off-road equipment.

More modern technologies provide solutions to these problems adequately. Friction plate wear can be reduced significantly and the load carrying capability exceeds the requirements for API GL-4 and TO-4 substantially.

Puma Energy wants our customers to know we are keeping up with these latest developments and that we have the solutions they need for their equipment from the past, today and in the future.

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Automotive

Puma UniSynth Gear Oil 75W-90

High Performance Fully Synthetic Gear-and Final Drive Oil

Description

PUMA UniSynth Gear Oil 75W-90 is a Next Generation, Synthetic EP (Extreme Pressure) gear oil designed for highly loaded gears and axles. It can also be used in other automotive applications including conventional gear-boxes on cars and trucks, final drives, power take-offs on farm and earth-moving machinery where API GL-5 is required. PUMA UniSynth Gear Oil 75W-90 high and low temperature performance exceeds those of conventional SAE 80W-90 or SAE 85W-90 gear lubricants.

Usages

PUMA UniSynth Gear Oil 75W-90 is recommended for applications where wear or heat present major problems. These applications include manual transmissions where EP type lubricants are recommended, heavy and medium duty differentials including limited slip, and transfer cases for heavy equipment, trucks, tractors and industrial gear drives. Final gear drives and differentials in railway, trams and high speed trains are other potential uses of these lubricants.

Fully Synthetic, High Viscocity Index, Anti-Wear EP, Extended ODI

Specifications

Meets:

API GL-5/ MT-1
SAE J2360
MAN 341 Z2/ 342 M3/ 342 S1/ 342 M2
Meritor O76-E/ O94
DAF Trucks
Renault
Scania STO 1:0/ 1:1G/ 2:0 A FS
Volvo Transmission Oil 97312

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma UniSynth 75W-90
SAE Grade			SAE J-306	75W-90
Kinematic Viscosity	100°C	cSt	ASTM D-445	17.5
Kinematic Viscosity	40°C	cSt	ASTM D-445	132
Viscosity	- 40°C	cP	ASTM D-2983	<150000
Viscosity Index	-	-	ASTM D-2270	152
Flash Point	-	°C	ASTM D-92	>200
Pour Point	-	°C	ASTM D-97	-45
Foam Test Sequence I			ASTM D-892	0/0
Foam Test Sequence II			ASTM D-892	10/0
Foam Test Sequence III			ASTM D-892	0/0
Density	15.6°C	g/mL	ASTM D-4052	0.872

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Puma Gear Oils EP

Heavy Duty Gears & Final Drives

Description

Puma Gear Oils EP are EP (Extreme Pressure) gear oils for very highly loaded gears in general. Can also be used in automotive applications including heavy duty axles, conventional gear-boxes and steering-boxes on cars and trucks, gear-boxes, final drives, power take-offs on farm and earth-moving machinery.

Usages

Puma Gear Oils EP are Extreme Pressure gear oils are formulated to meet API GL-5 specifications. These oils can thus be used for lubricating all gears and all material types.

Anti-wear & EP Protection Oxidation Resistance, Anti-foam Performance

Specifications

Meets:

API GL-5
MAN 342 Type 2
ZF TE-ML 05A 07A 12E 16B 16C
17B 19B 21A

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma Gear Oils	
SAE Grade			SAE J-306	80W-90	85W-140
Kinematic Viscosity	100°C	cSt	ASTM D-445	14.5	28
Kinematic Viscosity	40°C	cSt	ASTM D-445	145	405
Viscosity Index	-	-	ASTM D-4292	105	100
Flash Point (COC)	-	°C	ASTM D-92	>200	>200
Pour Point	-	°C	ASTM D-97	-30	-18
Density	15.6°C	g/ml	ASTM D-4052	0.9	0.91

These characteristics are typical of current product methods whilst future production will conform to Puma Lubricants specifications, variations in these physical characteristics may occur. Please request the Technical Data Sheet for more detailed information.

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Puma Energy South Africa 4th floor, 15 Alice Lane, Sandton 2146 Johannesburg

Automotive

Puma Gear Oils LS

Limited Slip

Description

Puma Gear Oils LS series are EP (Extreme Pressure) gear oils formulated with extra high performance additive system for limited-slip differentials.

Usages

Puma Gear Oils LS can also be used in conventional gear-boxes and steering-boxes on cars and trucks, and in gear-boxes, final drives and power take-offs on farm and earth-moving machinery requiring API GL-5. It can thus be used for lubricating all gears and all material types

Anti-wear & EP Protection Oxidation Resistance, Anti-foam Performance

Specifications

Meets:

API GL-5
API MT-1
SAE J2360
Scania STO 1:0
Mack GO-J/ GO-J Plus

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma Gear Oil LS 80W-90	Puma Gear Oil LS 85W-140
ISO Viscosity Grade			ISO 3448	80W-90	85W-140
Kinematic Viscosity	40°C	cSt	ASTM D-445	145	405
Kinematic Viscosity	100°C	cSt	ASTM D-445	14.5	28
Viscosity Index			ASTM D-4292	105	100
Flash Point (COC)		°C	ASTM D-92	> 200	> 200
Pour Point		°C	ASTM D-97	-30	-18
Density	15.6 °C	kg/m3	ASTM D-4052	0.900	0.910

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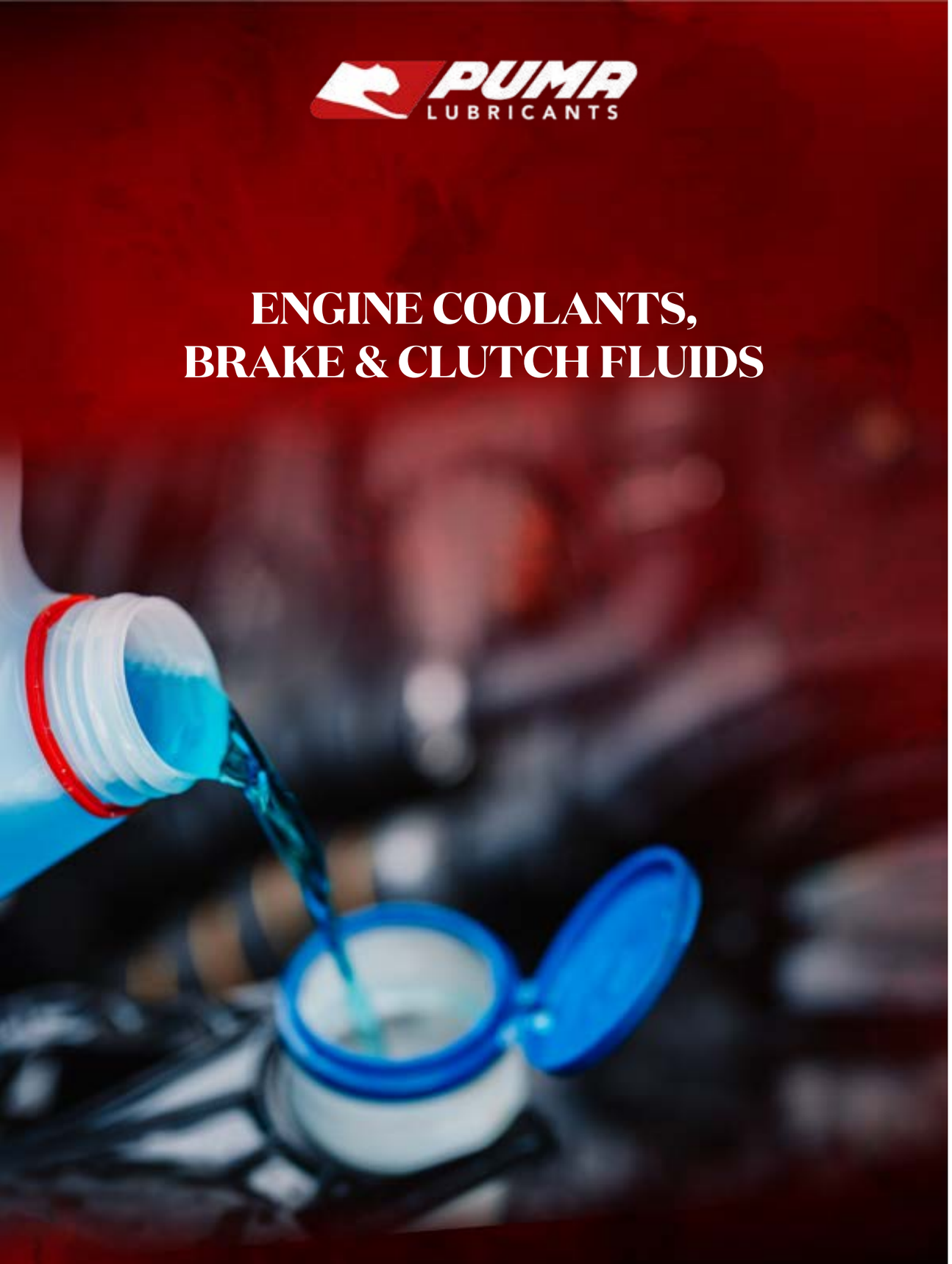

ENGINE COOLANTS, BRAKE & CLUTCH FLUIDS

Engine Coolants

An engine coolant is not just a water diluted glycol.
Nowadays engine coolants are engineering components fulfilling very important tasks in the engine.
Engine coolants need to have excellent heat transfer properties in the first place. However, engine coolants also need to prevent corrosion, foaming, deposits and cavitation.
Engine coolants should also be compatible with polymers, elastomers, hard water and must remain stable at high temperatures.
Besides all this, engine coolants should prevent against freezing and should increase the coolant boiling point.

There are several technologies which all have their own merits.
Silicate type technology which very quickly build protective layers on the surfaces (especially on aluminium surfaces) protecting against corrosion, cavitation and deposition, can be nitrite based or nitrate free
Organic Acid Technology (OAT) is usually Silicate free (Si-free) and this technology shows very low depletion rates ensuring extended coolant life (Extended Life Coolants – XL)
The Si-OAT coolants combine the benefits of Si coolants and OAT coolants, fast formation of the protective layer and the low depletion rate of OAT.

Puma Energy wants our customers to know we are keeping up with these latest developments and that we have the solutions they need for their equipment from the past, today and in the future.

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Puma HD Hybrid Coolant

Heavy Duty Coolant for Mixed Fleet Applications

Description

Puma HD Hybrid Coolant uses inhibitors based on a combination of inorganic salts (as found in traditional coolant) and some fully neutralized organic acids (as found in OAT coolant). Puma HD Hybrid Coolant combines the advantages of coolants that contain silicates and those that are silicate free.

Usages

Typically pink/red in colour. Designed for use in both automotive, light duty and heavy duty diesel applications. Product has good coolant to coolant compatibility. Excellent wet sleeve liner cavitation protection. Good high temperature aluminium performance.

Puma HD Hybrid Coolant does not contain 2-Ethyl-Hexanol (2EH)

Pre-Mix & Concetrate, Compatible, Extended Life

Specifications

Meets:

AS 2108-2004
ASTM D-6210
ASTM D-7583 (John Deere Cavitation)
ASTM D-3306
ASTM D-4985
BS 6580:2010
SAE J1034
CUNA NC 956-16
JIS K 2234:2206
AFNOR NFR 15-601
ÖNORM V 5123
MTU (MTL 5048 approved)
SANS 1251:2005
China GB 29743-2013

Meets:

Bentley+ Audi+ Bugatti+ Lamborghini+ Seat+ Skoda+ VW (TL-774-G), Cummins (CES14603), Deutz (DQC CC-14), Deutz Fahr (>04/2017), Ducati, Irizar (>09/2016), Liebherr (Min LH-01-COL3A), MAN (MAN 324 Si-OAT), Mercedes Benz Cars (MB 325.6, MB 326.6), Mercedes-Benz Trucks & Busses (MB 325.5, MB 326.6), Porsche (>2010), SETRA (MB 325.5), Smart (MB 325.6)

Typie

Property	Temp	Units	Test Methods	Puma HD Hybrid Coolant 5050	Puma HD Hybrid Coolant Concentrate
Appearance				Pink/Red	Pink/Red
Density	15 °C	kg/l	ASTM 4052	1.07	1,123 – 1.126
pH-value		°C		8	8.2 – 8.6
Boiling Point		°C		>100	>163
Refractive Index					1.432 – 1.436

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Puma HD XLP/ XLC

Heavy Duty Coolant for Mixed Fleet Applications

Description

Puma HD XLP Coolant based on ethylene glycol and OAT (Organic Acid Technology) provides maintenance-free protection against freezing, boiling and corrosion.

Usages

The product is easy-to-use and it is suitable for use in the radiator systems of almost all types of vehicles on-road and off-road. Puma HD XLP Coolant is the ready to use pre-mix.

To obtain full advantage of the performance of this product, it is advisable not to mix it with other types of antifreeze.

Pre-Mix & Concetrate, Compatible, Extended Life

Specifications

Amongst Many More Meets:

ASTM D-3306
ASTM D-4556
ASTM D-4985
ASTM D-6210
Cummins CES 14439
John Deere Cavitation Test
ASTM D-7583
Caterpillar CCM34
VW TL 774F
MAN 324 Type SNF
GM 6277M
MTU MTL 5048
MB 325.3
Ford WSS-M97B44-D

Typical characteristics of the product

Property	Temp	Units	Test Methods	"Puma HD XLP Coolant Premix 5050"	"Puma HD XLC Coolant Concentrate"
Appearance				Orange	Orange
Specific Gravity	20 °C	kg/l	ASTM D-5931	1.068	1.113
Ph			ASTM D-1287	8.6	8.6
Equilibrium Boiling Point	°C		ASTM D-1120	108	180
Foaming Properties? Break Time	25°C		ASTM D-1881	50 ml/ 5 sec.	n/a
	88°C		ASTM D-1881	50 m/ 5 sec.	n/a
Freezing Protection	°C			-40	n/a
Effect on non-metals			GME60 255	No effect	No effect
Hard water stability			VW PV 1426	No precipitate	n/a
Water content		% w/w		approx. 50	5 max.
Nitrite, amine, phosphate, borate, silicate				nil	nil

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Puma HD Coolant

Biodegradable coolant based on ethylene glycol

Description

Puma HD Coolant is a coolant based on ethylene glycol and its formulation does not involve any presence of amines, phosphates and nitrites (NAP free).

Performs very well in almost all passenger cars and motorcycles

Usages

The product is easy-to-use and it is suitable for use in the radiator systems of almost all types of cars and motorcycles. Puma HD Coolant 5050 is the ready to use pre-mix.

To obtain full advantage of the performance of this product, it is advisable not to mix it with other types of antifreeze.

Pre-Mix & Concetrate, Compatible, Extended Life

Specifications

Meets:

VW : TL 774 C
BMW : N 600 69.0
MAN : 324 Type NF
GM : B040 0240
SAAB : 6901 599
MTU : MTL 5048
MB : 325.0

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma HD Coolant 50 50	Puma HD Coolant Concentrate
Appearance				Yellow	Fluorescent Green
Density	15 °C	kg/l	ASTM 4052	1.077	1.122
Ph				7	7.2
Boiling Point		°C		108	180
Reserve Alkalinity		m/0.1	NHCL		15

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Puma Hydraulic Brake and Clutch Fluid DOT 4

Hydraulic Brake and Clutch Fluid

Description

Puma Brake Fluid DOT 4 is a yellow-coloured liquid, formulated for use in all disc, drum braking systems and in clutch control systems. It is also specifically suitable for those cases where the braking system are subjected to very severe operating conditions such as, cars pulling caravans, commercial vehicles and any Heavy loaded operations.

Usages

Puma Brake Fluid DOT 4 meets the requirements of the following specifications:
SANS 1905
SAE J 1703
F.M.V.S.S. No.116 DOT3 and DOT4
ISO 4925
CUNA NC 956 DOT4

High Boiling Point, Low Freezing Point, Non-Corrosive

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma Hydraulic Brake and Clutch Fluid
Kinematic Viscosity	-40°C	mm2/s (cSt)	ASTM D-445	1300
Kinematic Viscosity	100°C	mm2/s (cSt)	ASTM D-445	2.2
Boiling Point		°C	ASTM D-92	265
Wet Boiling Point		°C		170
Color				Yellow
Pour Point		°C	ASTM D-97	-24
Density	15 °C	kg/l	ASTM D-4052	1.07

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SPECIAL PRODUCTS

Puma Ultimate Rail S 40 & 20W-40

Locomotive/ Railroad Diesel Engine Oils

Description

Puma Ultimate Rail S is formulated to provide unsurpassed engine cleanliness, soot handling and oil filter life in latest models EMD and GE engines in a wide range of railroad, inland, marine and stationary engine applications.

Usages

Puma Ultimate Rail S is a cost-effective solution for Tier 4 locomotive engines and older generation models. Available in monograde SAE 40 especially for 2-stroke engines and multigrade 20W-40 for 4-stroke engines

Locomotive Railroad, LMOA Gen 7, Zinc-Free

Specifications

Meets:

API CF
LMOA Generation 7 and lower
Especially designed for Tier 4 engines EMD
GE GEN 4 Long Life
CAT 3600s

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma Ultimate Rail S	
Viscosity Grade	SAE		J300	40	20W-40
Kinematic Viscosity	40°C	mm2/s (cSt)	ASTM D-445	146	132
Kinematic Viscosity	100°C	mm2/s (cSt)	ASTM D-445	14.5	14.5
Apparent Viscosity	10°C	mPa.s		n/a	4200
Viscosity Index			ASTM D-4292	100	116
Flash Point (COC)		°C	ASTM D-92	240	240
Pour Point		°C	ASTM D-97	-21	-26
Density	@ 20 °C	kg/L	ASTM D-4052	0.891	0.891
Total Base Number		mg KOH/g	ASTM D-2896	13	13

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Puma Super Tractor Oil Universal

Super Tractor Universal Oil - STOU

Description

Puma Super Tractor Oil Universal 15W-40 is a multifunctional oil suitable for the lubrication of all parts (engines included) of practically all farm machinery of all makes and ratings, except for particularly heavily-loaded drives for which the makers specify an EP oil of API GL-4 level.

Usages

STOU
SAE 15W-40
API GL-4

Anti-wear Protection, Oxidation Resistance, Universal Oil

Specifications

Amongst Many More Meets:

API : GL-4	ACEA : E3	EATON M2950S & I-280-S
API : CE/CD/CF-4/SF	Massey-Ferguson M1144-M1145	Agrifarm NH, 024 C
MB 227.1	FORD ESEN M2C-159B	Sauer Danfoss Hydrostatic
John Deere JDM-J27	ZF TE-ML 06B, 06C, 07B	Trans Fluid
Caterpillar : TO-2	Allison C-4	New Holland 82009203

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma Super Tractor Oil Universal
Viscosity Grade		SAE	J-300	15W-40
			J-306	90
Kinematic Viscosity	40°C	cSt	ASTM D-445	112.6
Kinematic Viscosity	100°C	cSt	ASTM D-445	14
Viscosity Index			ASTM D-4292	135
Flash Point (COC)		°C	ASTM D-92	220
Pour Point		°C	ASTM D-97	-30
Density	15 °C	kg/l	ASTM D-4052	0.897
Total Base Number (TBN)		mg KOH/g	ASTM D-2896	7

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Automotive

Puma 2 Stroke Outboard TCW3

2 Stroke Outboard TCW3

Description

Puma 2 Stroke Outboard TCW3 is a lubricant used in gasoline-oil (petrol) mixtures employed in air-cooled and water-cooled two-stroke engines of outboard marine engines, personal water craft. It is formulated with selected components and is perfectly compatible with for mixing with all present unleaded gasolines.

Usages

Puma 2 Stroke Outboard TCW3 meets the requirements of API TC-W3

Anti-wear Protection, Oxidation Resistance, 2 Stroke Outboard

Typical characteristics of the product

Property	Temp	Units	Test Methods	2 Stroke Outboard TCW3
Kinematic Viscosity	40°C	mm2/s (cSt)	ASTM D-445	107
Kinematic Viscosity	100°C	mm2/s (cSt)	ASTM D-445	11.9
Viscosity Index			ASTM D-4292	100
Flash Point (COC)		°C	ASTM D-92	150
Pour Point		°C	ASTM D-97	-24
Density	15 °C	kg/l	ASTM D-4052	0.88

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Puma Wash & Wax

Designed for Very Dirty Surfaces

Description

Puma Wash & Wax has been designed for very dirty surfaces containing grease, oils and stubborn dirt. It has solvents that loosens and removes all different types of soiling dirt compared to ordinary detergents. Puma Wash & Wax complies with all SABS 1344 requirements.

Benefits

- Excellent dirt removal qualities
- Effective on grease on oil
- Contains both solvents and detergents
- Biodegradable and environmentally friendly
- Free rinsing
- Long shelf life

Environmentally Friendly, SABS 1344

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma Wash & Wax
Appearance				Pink
Density	20 °C	kg/l	ASTM 4052	1.072
Ph				11 – 12,5
Odour				Solvent
Emulsifiable			SABS1344	Complies

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INDUSTRIAL GEAR OILS

Total Fluid Management: shedding the light on cost saving opportunities

It is 10 times more expensive to remove a contaminant from a lubricant than it is to prevent the contaminant entering the lubricant in the first place.

This statistic shows the importance of Total Fluid Management (TFM); an area which encompasses not only the selection of the right lubricant, but correct delivery, storage and transfer, too.

Undertaking each of these activities with care puts companies in line for major cost savings – which is why Puma has developed a TFM app which is able to address the criteria typically examined during a TFM audit. This provides a clear snapshot of a client's strength and weaknesses, then plots a way forward for them to address their specific challenges. Importantly, customers are involved in the co-creation of an optimisation plan, which also helps to quantify possible cost savings.

These cost savings are potentially significant. Reports from a number of esteemed industry associations show that an investment in proper lubrication can translate into enviable advantages for any company. For example, an investment of $1 000 in proper lubrication can yield a cost saving of around $40 000. Consider, too, that just 3% of maintenance budgets are spent on lubricants, while over 80% of mechanical issues are related to lubrication in some way.

These figures demonstrate just how the right choice of lubricant (in the right quantity, at the right place and right time, and with the right attitude), can make all the difference. This is where TFM has a role to play, and explains why a TFM audit must be comprehensive, taking into account a range of factors.

Starting with the receipt and storage of lubricant, the audit will examine procedures for off-loading and storage, before assessing handling and application, which includes how lubricant is repacked and transferred on-site and then dispensed or used during in-service operations. Checks will be carried out to ensure that all containers are properly labelled and that there is no visible damage to packaging, amongst other factors, while the storage audit will take into consideration how the packages are protected against dust and moisture, whether they are stored vertically or horizontally, and measures taken to prevent exposure to heat. When it comes to transferring and repacking the lubricant, the audit examines factors such as whether there is a dedicated area for these processes, and whether transfer pumps are kept clean and stored properly.

Contamination control forms a large part of the audit; important because, as previously indicated, the cost of keeping lubricant clean is just 10% that of removing dirt. Customers' practices are therefore examined to assess steps taken to prevent contamination, and to ensure that the required cleanliness levels are maintained. An audit will also cover condition monitoring and lubricant analysis, as well as health, safety and environment, with processes like the storage of used oil, its collection and disposal coming under the spotlight. For example, the auditors will ensure that containers for used or waste lubricant are clearly labelled, and that used materials are collected by a certified and reputable contractor.

The company's performance across each of these different platforms is rated according to a scorecard, so that it is immediately possible to identify areas for improvement, clarify priorities and set in motion the requisite action.

The power of the TFM audit is demonstrated by one undertaking, where the customer was alerted to 30 different areas for potential improvement and cost saving opportunities.

With such opportunities highlighted, a business is certain to operate more efficiently, more profitably, and more safely.

THE USED
OIL DISPOSAL
MUST BE REVIEWED
INTENSIVELY BY THE MINE
AND PUMA.
THIS IS HIGH PRIORITY.

THERE IS AN URGENT NEED TO
UPGRADE THE USED OIL FACILITY
TO ACCOMMODATE THE EXPANDED
MOBILE EQUIPMENT FLEET SIZE.
THE EXISTING STORAGE CAPACITY
WAS INSTALLED WHEN THE MINING
OPERATIONS WERE JUST STARTING.

Industrial Gear Oils

The market demand for greater efficiencies is driving a more demanding equipment design, leading to tighter requirements on wear, seal compatibility and filtration to reduce potential contamination and improve efficiencies.

The size of gearboxes transferring the same power has been reduced by more than 30% over 40 years. This puts much higher stress on the fluid and higher performance is required in foam, air entrainment, filtration etc.

Despite the increased power density, the end-users demand high level of reliability and robustness as annual operating hours increase, no downtime accepted, longer lifetime and high level of cleanliness is required.

The market is moving towards the use of synthetic fluids especially when long life is needed.

There is a special focus on seals as leakages or not accepted and longer life is needed.

The priority concerns of end users are oil contamination, bearing wear, vibration and overheating followed by gear wear, seal leakage, scuffing and filter blocking.

Approx. 60% of the industrial OEM (Original Equipment Manufacturer) specifications originate from Europe and regarding the gearbox/ gear oil specifications Flender is the most recognised fluid quality driver.

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Puma Synthetic Industrial Gear Oils

Heavy Duty Synthetic Industrial Gear Oils

Description

Puma Synthetic Industrial Gear Oils have been developed to operate in the most severe of operating conditions. They reduce friction, increase energy efficiency and have a long service life. These oils are formulated from High Quality (PAO –Poly alpha olefin) base stocks and unique technology advanced additive packs ensure good high-speed and shock-load and low-speed and high-load performance.

Usages

Puma Synthetic Industrial Gear Oils are recommended for splash or circulation lubrication of all types of enclosed gears, especially where operating conditions involve heavy loads, high speeds and high relative sliding velocities, at elevated ambient and operating temperatures. This oil can also be used to lubricate other heavily loaded parts and components such as couplings, transmission screws and low speed plain bearings. Can be used in oil-mist lubrication systems.

Anti-Wear Protection, Oxidation Resistance, Anti-Foam Performance, Micro-Pitting Resistant

Specifications

Meets:

DIN 51517-3, CLP HC
AGMA 9005-E2
ISO 12925-1/ ISO 6743-6 CKC
David Brown S1.53.101E
US Steel 224
Flender and Siemens MD Specifications

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma Synthetic Industrial Gear Oil					
Viscosity Grade ISO	-	-	ISO 3448	68	150	220	320	460	680
Density	20°C	g/mL	ASTM D-1250	0.877	0.882	0.883	0.883	0.879	0.879
Viscosity Kinematic	40°C	mm2/s (cSt)	ASTM D-445	68	158	230	335	462	680
Viscosity Kinematic	100°C	mm2/s (cSt)	ASTM D-445	8.8	22	30	40	50	71
Viscosity Index	-	-	ASTM D-2270	163	163	160	159	170	180
Flash Point	-	°C	ASTM D-92	238	238	250	252	>246	>250
Pour Point	-	°C	ASTM D-97	-45	-45	-45	-42	-36	-30
Rust Prevention			ASTM D-665B	Pass					
Copper Corrosion – Part B			ASTM D-130	1b max					
FZG Scuffing Load Test (A/8.3/90)			ASTM D-5182	-	>12				
			DIN 51354-2						
FZG Micropitting Test			FVA 54/7	n/a	n/a	>10			
						high			

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Puma PSF Extreme Gear Oils

High Performance Gear Oil, PSF Technology

Description

PUMA PSF Extreme Gear Oil is a high performance gear oil formulated for use in all gearboxes, especially where excessive wear and short component life is experienced. Inadequately lubricated gears and bearings can experience scuffing under high load. Scuffing occurs when the opposing asperities weld and shear due to metal-to-metal contact. The unique PSF (Plastic Smoothing Formation) technology stops scuffing by forming an extremely strong protective layer in the area of contact.

Usages

PUMA PSF Extreme Gear Oil can be used in any gearbox, but are especially effective where conventional gear oils fail, where long component life is essential or where long oil drain intervals are required.

Suitable applications can be found in any industry

Anti-Wear Protection, Oxidation Resistance, Anti-Foam Performance, Micro-Pitting Resistant

Specifications

Meets:

DIN 51517-3

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma PSF Extreme Gear Oils						
Viscosity Grade ISO	-	-	ISO 3448	150	220	320	460	680	1000	1500
AGMA Grade				4 EP	5 EP	6 EP	7 EP	8 EP	8A EP	9 EP
Density	15.5°C	g/mL	Gardner Method	0.876	0.876	0.902	0.895	0.884	0.902	0.909
Viscosity Kinematic	40°C	cSt	ASTM D-445	146	215	320	456	671	1000	1539
Viscosity Kinematic	100°C	cSt	ASTM D-445	15.2	19.8	28	36.1	50	61.5	83.1
Viscosity Index	-	-	ASTM D-2270	105	106	120	119	120	120	123
Flash Point	-	°C	ASTM D-92	199	204	204	204	204	243	243
Pour Point	-	°C	ASTM D-97	-24	-24	-15	-12	-9	-12	-12
Rust Prevention			ASTM D-665B	Pass						
Copper Corrosion			ASTM D-130	1B						
4-Ball Wear Scar		mm	ASTM D-4172	0.4						
FZG Scuffing Load Test (A/8.3/90)			ASTM D-5182	>12						
			DIN 51354-2							
FZG Micro-pitting Test			FVA 54/7	m/a	>10 high				n/a	n/a

These characteristics are typical of current product methods whilst future production will conform to Puma Lubricants specifications, variations in these physical characteristics may occur. Please request the Technical Data Sheet for more detailed information.

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Puma Industrial Gear Oils EP

Heavy Duty Industrial Gear Oils

Description

Puma Industrial Gear Oils have been developed to meet the widest range of requirements of EP (Extreme Pressure) lubrication, such as gears operating under severe duty. These oils are formulated from high quality base stocks and technology advanced additive packs, such as sulphur compounds (which ensure good high-speed and shock-load performance) and phosphorus compounds (for low-speed and high-load performance). Available in ISO 68, 150, 220, 320, 460, 680 &1000.

Usages

Puma Industrial Gear Oils EP are recommended for splash or circulation lubrication of all types of enclosed gears, especially where operating conditions involve heavy loads, high speeds and high relative sliding velocities, at elevated ambient and operating temperatures. These oils can also be used to lubricate other heavily loaded parts and components such as couplings, transmission screws and low speed plain bearings. Can be used in oil-mist lubrication systems.

Anti-Wear Protection, Oxidation Resistance, Anti-Foam Performance, Micro-Pitting Resistant

Specifications

Meets:

DIN 51517-3, CLP
AGMA 9005-E2
ISO 12925-1
David Brown S1.53.101E
US Steel 224

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma PSF Extreme Gear Oils						
Viscosity Grade ISO		-	ISO 3448	68	150	220	320	460	680	1000
Density	20°C	g/mL	ASTM D-1250	0.881	0.882	0.883	0.888	0.889	0.889	0.91
Viscosity Kinematic	40°C	mm2/s (cSt)	ASTM D-445	68	150	220	320	460	680	1000
Viscosity Kinematic	100°C	mm2/s (cSt)	ASTM D-445	8.52	14.5	18.7	23.9	30.3	39.2	45
Viscosity Index		-	ASTM D-2270	95	95	95	95	95	95	99
Flash Point		°C	ASTM D-92	227	240	240	240	246	250	260
Pour Point		°C	ASTM D-97	-24	-24	-21	-21	-21	-18	-6
Rust Prevention			ASTM D-665B	Pass						
Copper Corrosion PartB			ASTM D-130	18 Max						
FZG Scuffing Load Test A/8.3/90			ASTM D-5182	>12						
			DIN 51354-2							
FZG Micropitting Test			FVA 54/7	n/a	n/a	>10				
						high				

These characteristics are typical of current product methods whilst future production will conform to Puma Lubricants specifications, variations in these physical characteristics may occur. Please request the Technical Data Sheet for more detailed information.

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Puma Synthetic WMG Oil 680

Heavy Duty Synthetic Wheel Motor Gear Oil

Description

Puma Synthetic WMG Oil has been developed to operate in the most severe of operating conditions. They reduce friction, increase energy efficiency and have a long service life. The oil is formulated from High Quality (PAO –Poly Alpha Olefin) base stocks and unique technology advanced additive package to ensure good high-speed and shock-load and low-speed and high-load performance.

Usages

Puma Synthetic WMG Oil 680 is specifically designed for mining truck wheel motor gears. The excellent load carrying capabilities and extreme oxidation stability provide maximum gear protection under these very harsh operating conditions. This oil can also be used to lubricate other heavily loaded parts and components such as all type gearboxes, couplings, transmission screws and low speed plain bearings.

Anti-Wear Protection, Oxidation Resistance, Anti-Foam Performance, Pitting Protection

Specifications

Meets:

AGMA 9005-E02
DIN 51517 Part 3, CLP HC ISO
12925-1/ ISO 6743-6 CKC
Wabtec D50E35E
David Brown S1.53.101E
US Steel 224
Flender and Siemens MD
Specifications

Typical characteristics of the product

Test	Temp	Units	Test Method	Puma Synthetic WMG Oil 680
Viscosity Grade ISO		-	-	680
Density	20°C	g/mL	ASTM D-1250	0.879
Viscosity Kinematic	40°C	cSt	ASTM D-445	680
Viscosity Kinematic	100°C	cSt	ASTM D-445	71
Viscosity Index		-	ASTM D-2270	180
Timken Load		lb	ASTM D-2782	>65
Flash Point		ºC	ASTM D-92	>250
Pour Point		ºC	ASTM D-97	-30
Rust Prevention			ASTM D-665B	Pass
Copper Corrosion – Part B			ASTM D-130	1b max
FZG Scuffing Load Test (A/8.3/90)			"ASTM D-5182 DIN 51 354-2"	>14
FZG Micropitting Test			FVA 54/7	">10 high"
FAG-FE-8 Roller Bearing D7.5/80-80	80°C	mg	DIN 51819-3	<10

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Hydraulic Oils

The market demand for increased power output as well as smaller sump sizes puts a lot of stress on the hydraulic fluid which requires high level of cleanliness using fine filtration and changing base oil from typical Group I to Group II or even Group III.

Puma has been using Group II base oils already for several years for our premium hydraulic fluids.

The drive to reduced total cost of ownership by extended equipment and component life, extended oil drain intervals, increased hose and seal attention, faster valves 7 actuators simply require high performance hydraulic fluids.

OEM's noticed that in many cases the international standards are not sufficient and set their own standards especially for critical equipment.

Bosch Rexroth latest specification RDE 90235 and resulting product listing BR 90245 for products meeting or even exceeding the harshest test specifications ensure the hydraulic fluid can assist the end-user to reduce the TCO to operate the hydraulic equipment at highest efficiency.

The Puma uses premium hydraulic oil additive technologies in conjunction with Group II base oils which provide optimum operation at highest efficiency.

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Industrial

PUMA HYDRAULIC OILS AW

Industrial Anti-Wear Hydraulic Oils

Description

Puma Hydraulic Oils are high quality lubricating oils specially developed for use in all types of industrial plant hydraulic systems and mobile equipment. These oils are formulated from selected base stocks treated with "low zinc" technology which provides for very high thermal stability, oxidative stability and hydrolytic stability. Puma Hydraulic Oils (ISO VG from 22 to 100) are classified DIN 51524 T3 HLP and ISO-L-HM.

Usages

PUMA Hydraulic Oils AW are recommended to be used in all major applications and equipment type (from mining to CNC), underground mining applications, hard rock mining, marine and high performance industrial manufacturing operations. PUMA Hydraulic Oils AW out performs standard Anti-Wear Hydraulic Oils and hence can be used in high temperature/ high pressure applications.

Anti-Wear Protection, Oxidation Resistance, Anti-Foam Performance

Specifications

Meets:

Bosch Rexroth RDE 90235
Parker (Denison) HF-0, HF-1, HF-2
Fives (MAG) P-68, P-69, P-70
JCMAS P041: 2004 HK
GB 11118.1-2011
GM LS-2 2011
SAE MS 1004 (HM)
ISO 1158 (HM)
Eaton E-FDGN-TB002-E
ASTM D-6158
AIST 126, 127
SEB 181222
DIN 51524 T3 (HLP)

Typical characteristics of the product

Property	Temp	Units	Test Methods	Hydraulic Oil AW 22	Hydraulic Oil AW 32	Hydraulic Oil AW 46	Hydraulic Oil AW 68	Hydraulic Oil AW 100
ISO Viscosity Grade			ISO 3448	22	32	46	68	100
Fluid Type			ISO/DIN	HM/HLP	HM/HLP	HM/HLP	HM/HLP	HM/HLP
Kinematic Viscosity	40°C	cSt	ASTM D-445	22	32	45	68	100
Kinematic Viscosity	100°C	cSt	ASTM D445	4.4	5.6	7.1	9.2	11.3
Viscosity Index			ASTM D-4292	100	105	105	105	105
Flash Point (COC)		°C	ASTM D-92	200	211	230	241	250
Pour Point		°C	ASTM D-97	-39	-36	-33	-33	-24
Density	15 °C	kg/m3	ASTM D-4052	0.860	0.8616	0.8649	0.8673	0.870
Demulsibility	54 °C	"ml OWE min"	ASTM D-1401	N/A	"40/40/0 (15)"	"40/40/0 (15)"	"40/40/0 (10)"	"40/40/0 (10)"
Rust Test A &B, rating, 24 hrs			ASTM D-665A	Pass	Pass	Pass	Pass	Pass
Copper Corrosion, rating,3hrs	100 °C		ASTM D-130	1B	1B	1B	1B	1B
"FZG A/8.3/90, Load Stage Passed"			"ASTM D-5182 DIN 51354"	>11	>11	>12	>12	>12
"Pump Test, Eaton 35VQ25, Total wear"		mg	Eaton ATS 373	N/A	< 25	< 25	< 25	< 25

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Puma HYDRAULIC OILS HVI

Industrial High Viscosity Index AW Hydraulic Oils

Description

PUMA Hydraulic oils HVI are advanced heavy duty hydraulic oils with a high viscosity index to meet the requirements of modern hydraulic systems and to combat severe heat, pressure and difficult working conditions. They have been formulated from high quality refined mineral oil and specialist additives to deliver high performance under severe conditions. They also show excellent flow characteristics at low temperature.

Usages

PUMA Hydraulic Oils HVI contain anti-wear additives as well as rust, oxidation and corrosion inhibitors that reduce component wear and promote longer component- and lubricant life, ensuring optimum hydraulic system performance and efficiency.
PUMA Hydraulic Oils HVI meet or exceed major pump OEM'S including Bosch Rexroth RDE 90235 (officially listed on RDE 90245 BR 1010-0075) and outperforms standard Anti-Wear Hydraulic oils. PUMA Hydraulic HVI is available in ISO viscosity grades 15, 32, 46, 68

Anti-Wear Protection, High Viscosity Index, Oxidation Resistance, Anti-Foam Performance

Specifications

Meets:

Bosch Rexroth RDE 90245 (ISO 46 & 68)
Parker (Denison) HF-0, HF-1, HF-2
Fives (MAG) P-68, P-69, P-70
JCMAS P041: 2004 HK
GB 11118.1-2011
GM LS-2 2011
SAE MS 1004 (HM, HV)
ISO 1158 (HM, HV)
Eaton E-FDGN-TB002-E
ASTM D-6158
AIST 126, 127
SEB 181222
DIN 51524 T3 (HLP, HLPV)

Typical characteristics of the product

Property	Temp	Units	Test Method	Puma Hydraulic Oil HVI 15	Puma Hydraulic Oil HVI 32	Puma Hydraulic Oil HVI 46	Puma Hydraulic Oil HVI 68
ISO Viscosity Grade			ISO 2422	15	32	46	68
Fluid Type			ISO/DIN	n/a	HM, HV/ HLP, HLPV	HM, HV/ HLP, HLPV	HM, HV/ HLP, HLPV
Kinematic Viscosity	40°C		ASTM D-445	15.8	32.8	46.5	67.1
Kinematic Viscosity	100°C		ASTM D-445	4.04	6.4	8.3	10.8
Viscosity Index			ASTM D-2270	165	151	155	150
Flash Point COC		°C	ASTM D-92	194	220	232	244
Pour Point		°C	ASTM D-97	-57	-44	-47	-44
Density		g/ml	ASTM D-4052	0.86	0.86	0.87	0.87
Demulsibility - 40/40/0	54°C	min	ASTM D-1401	10	10	10	10
Copper Corrosion	100 °C	-	ASTM D-130	N/A	1A	1A	1A
FZG A/8.3/90		FLS	DIN 51534-2	N/A	>11	>12	>12

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PUMA Hydransafe HFDU

Synthetic Hydraulic Fluid Type HEES / HFD-u – synthetic ester

Description

Usages

Puma Hydransafe HFDU series are synthetic fire resistant hydraulic fluid based on organic esters and carefully selected additives to achieve excellent hydraulic fluid performance. Puma Hydransafe series can also be used in environmentally sensitive hydraulic applications without compromising the overall hydraulic system operations Its high lubricity and anit-wear characteristics ensure reliable protection of hydraulic systems and components.

Anti-Wear Protection, Fire Resistant Biodegradable, Anti-Foam Performance

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma Hydransafe 46	Puma Hydransafe 68
Appearance/Color				Yellow/Amber	Yellow/Amber
ISO Viscosity Grade			ISO 2422	46	68
Kinematic Viscosity at	40°C	mm2/s	ASTM D-445	47.5	68
Kinematic Viscosityat	100°C	mm2/s	ASTM D-445	9.5	12.5
Viscosity Index			ASTM D-2270	190	185
Flash Point COC		°C	ASTM D-92	300	304
Fire Point		°C	ASTM D-92	360	360
Hot Manifold Auto Ignition Temp.		°C	ISO 20823		>450
Pour Point		°C	ASTM D-97	<-30	<-30
Density at	15°C	g/ml	ASTM D-1298	0.92	0.92
Demulsibility		"ml-ml-ml min"	ASTM D-1401	"41-39-0 30"	"41-38-0 30"
Copper Corrosion at	100 °C	-	ASTM D-665A/D-130	Pass	Pass
Foam, Sequence I	25°C	ml-ml	ASTM D-892	50/0	50/0
FZG A/8.3/90, FLS			DIN 51534-2	>12	>12
Biodegradability		% after 28 days	OECD-301 C	>86.5	>80.4

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Puma PumaSafe WG 46

Fire Resistant Hydraulic Fluid

Description

PumaSafe WG 46 is a fire-resistant hydraulic fluid type HFC, based on water-glycol acc. ISO 6743-4
PumaSafe WG 46 is a premium performance, water containing, synthetic hydraulic fluid. It greatly reduces risks where hydraulic equipment operates near flames, hot surfaces or molten metals.

Usages

Anti-Wear Protection, Fire Resistant, Anti-Foam Performance

Typical characteristics of the product

Property	Temp	Units	Test Method	"Puma Safe WG 46"
Appearance				Clear, red fluid
Specific Gravity	15°C	g/ml	ASTM D-4052	1.09
Kinetic Viscosity	40°C	cSt	ASTM D-655	39
pH				9.5
Pour Point		°C		-45
Flash Point		°C	ASTM D-92	none
Fire Point		°C	ASTM D-92	none
Water Content		%		40

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Industrial

Compressor Oils

Compressed air is known as the Fourth Utility.

Compressed air is a very versatile source of energy and is used in a wide and very diverse range of applications.

The advantages of compressed air are also very wide:

- Can be stored, using tanks located in places where no other power is available or practical.
- Has a low explosion hazard or fire risk.
- Equipment operated by compressed air can function at extreme temperatures.
- Compressed air can have a high degree of cleanliness, useful for hospitals, electronics and food manufacturing sites.
- Compressed air does not interfere with electronic equipment.
- Air tools are often much lighter than equivalent electrical models.
- Air tools are ideal for challenging applications and environments.

The main causes for lubricant failures in compressed air systems are Heat and Moisture
Heat is generated by the compression of air, this is a physical law. The generated heat causes degradation of the lubricant through oxidation, increasing sludge and deposits and increasing the oil viscosity.

Oil mist in the compressed gas is subject to micro dieseling, leaving soot deposits in the cylinder and valves (reciprocating compressors). These soot deposits eventually damage and block valves and even blocking the intercooler.

The solutions to heat impact are using compressor fluids with high oxidative and thermal stability in conjunction with additive systems with low volatility to reduce the level of lubricant mist.

Moisture enters the compressor through the air intake creating several issues like breakdown of the lubricating film leading to bearing failures, catalysis of lubricant oxidation increasing sludge and varnish formation and causes rust and corrosion of internal parts leading internal abrasion and bearing damages.

The solution to moisture is using a good compressor fluid which will rapidly separate from water which can be drained from the system.

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PUMA Synthtetic Compressor Oils

Rotary Compressor Oils

Description

Puma Synthetic Compressor Oils Are formulated from High quality PAO (Poly Alpha Olefin) base stocks that deliver reliable protection for rotary sliding vane and screw air compressors.

Usages

All grades are treated with anti-oxidant anti-rust and anti-wear additives. It has an additive system to provide good protection and performance for air compressors running up to 25 bar and excess of 100 degrees discharge temperature with oil maintenance intervals up to 12,000 hours.

Rust & Corrosion Protection, Oil Life Time, Oxidation Resistance, Anti-Foam Anti-Wear Performance

Specifications

Meets:

DIN 51 506 VDL
ISO L-DAJ

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma Synthtetic Compressor Oil 32	Puma Synthetic Compressor Oil 46	Puma Synthetic Compressor Oil 68	Puma Synthetic Compressor Oil 100
ISO Viscosity Grade			ISO 3448	32	46	68	100
ISO Fluid Type				ISO L-DAJ/ DIN VDL			
Kinematic Viscosity	40°C	mm2/s (cSt)	ASTM D-445	30.8	48	66	103
Kinematic Viscosity	100°C	mm2/s (cSt)	ASTM D-445	5.9	8	10	14
Viscosity Index			ASTM D-4292	139	139	137	138
Flash Point (COC)		°C	ASTM D-92	205	260	266	260
Pour Point		°C	ASTM D-97	-60	-48	-48	-39
Density	15 °C	kg/l	ASTM D-4052	0.827	0.833	0.835	0.843
FZG Test		FLS	CEC-L-07-A-85	>12			
Water Separability	54°C	min	ASTM D-1401	10			
Air Release		min	ASTM D-1401	2			
RPVOT		min	ASTM D-2272	2,200			

These characteristics are typical of current product methods whilst future production will conform to Puma Lubricants specifications, variations in these physical characteristics may occur. Please request the Technical Data Sheet for more detailed information.

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PUMA Compressor Oils

Rotary Compressor Oils

Description

Puma Compressor Oils are formulated from high quality mineral base stocks that deliver reliable protection for rotary sliding vane and screw air compressors.

Usages

All grades are treated with anti-oxidant anti-rust and anti-wear additives. It has an additive system to provide good protection and performance for air compressor's running up to 15 bar and 100 degrees discharge temperature with oil maintenance intervals up to 4000 hours.

Rust & Corrosion Protection, Oxidation Resistance, Anti-Foam Anti-Wear Performance

Specifications

Meets:

DIN 51 506 VDL
ISO L-DAB & DAG

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma Compressor Oil 32	Puma Compressor Oil 46	Puma Compressor Oil 68	Puma Compressor Oil 100	Puma Compressor Oil 150
ISO Viscosity Grade			ISO 3448	32	46	68	100	150
ISO Fluid Type				L-DAB				
Kinematic Viscosity	40°C	mm2/s (cSt)	ASTM D-445	32	46	68	100	146
Kinematic Viscosity	100°C	mm2/s (cSt)	ASTM D-445	5.3	6.8	11.1	10.9	17.1
Viscosity Index			ASTM D-4292	100	100	100	98	127
Flash Point (COC)		°C	ASTM D-92	205	215	220	260	260
Pour Point		°C	ASTM D-97	-15	-15	-12	-9	-30
Density	15 °C	kg/m3	ASTM D-4052	0.875	0.88	0.885	0.881	0.859
FZG Test		FLS	CEC-L-07-A-85	>11				
Water Separability	54°C	min	ASTM D-1401	15				10

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PUMA Reciprocating Compressor Oil 150

high-quality semi-synthetic lubricating oil

Description

Puma Reciprocating Compressor Oil 150 is a high-quality semi-synthetic lubricating oil designed for the lubrication of reciprocating (piston) and compressors with extremely low deposit and carbon residue build up. Puma Reciprocating Compressor Oil 150 is especially designed for the lubrication of sump lubricated piston compressors.

Usages

The high quality mineral base oil and PAO (Poly-Alfa-Olefin) provides extremely low carbon residue and deposit formation hence clean valves and intercooler and therefore reducing maintenance and repair costs as well as improving overall efficiency

Low Deposit/Carbon Residue, Improved Compressor Efficiency, Reduced Valve Blow-By, Anti-Wear Performance

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma Reciprocating Compressor Oil 150
ISO Viscosity Grade			ISO 3448	150
Fluid Type			ISO/ DIN	L-DAB/ VDL
Kinematic Viscosity	40°C	mm2/s (cSt)	ASTM D-445	146
Kinematic Viscosity	100°C	mm2/s (cSt)	ASTM D-445	17.07
Viscosity Index			ASTM D-4292	127
Flash Point (COC)		°C	ASTM D-92	260
Pour Point		°C	ASTM D-6749	-30
Density	15 °C	kg/l	ASTM D-4052	0.859
Demulsibility		min.	ASTM D-1401	10
FZG Test		FLS	CEC-L-07-A-85	>11

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Industrial

PUMA Refrigerating Compressor Oil 68

Refrigeration and air conditioning compressor oil

Description

Puma Refrigeration Compressor 68 is a high-quality semi-synthetic naphthenic/ GR III based lubricating oil designed for the lubrication of refrigeration and air conditioning compressors with good chemical stability when working with commonly used refrigerants.

Usages

Puma Refrigerating Compressor Oil is especially suitable for use with Ammonia, R-11, R-12 and R-22 refrigerants

Suitable for use in refrigeration compressors operating under moderate evaporator temperature conditions (see R12 Floc points) and thermal loads, including open and semi-sealed industrial types.

Low Temperature Performance, Low FLOC Point, Reliable Protection, Anti-Wear Performance

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma Refrigerating Oil 68
ISO Viscosity Grade			ISO 3448	68
Kinematic Viscosity	40°C	mm2/s (cSt)	ASTM D-445	68
Kinematic Viscosity	100°C	mm2/s (cSt)	ASTM D-445	7.4
Viscosity Index			ASTM D-4292	100
Flash Point (COC)		°C	ASTM D-92	220
Pour Point		°C	ASTM D-97	-30
Density	15 °C	kg/l	ASTM D-4052	0.885
Frigidaire Viscosity No				300

These characteristics are typical of current product methods whilst future production will conform to Puma Lubricants specifications, variations in these physical characteristics may occur. Please request the Technical Data Sheet for more detailed information.

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Lubricating Greases

As a rule of thumb, approx. 80% of all lubricants used are oils and only 20% of all lubricants used are greases. However, approx. 80% of all lubrication applications are grease lubricated applications and only 20% are oil applications.

This means that by far most applications use grease hence grease lubrication is crucial for any operation. This also explains the very wide variety of lubricating greases used in the market. Several types of greases, different thickener types, base oils and additive technologies are being used.

The selection of the proper grease is extremely important but the application method is as important. A good grease used incorrectly will not provide the performance required.

Especially for grease the 5 R's of lubrication specifically apply:

1. Right grease
2. Right place
3. Right quantity
4. Right time
5. Right attitude

Why do we use grease in so many applications?
Using grease is much easier as it requires less effort and lower cost for construction, very often a simple grease nipple will do. Sealing is not a problem as grease is not as fluid as oil. Re-greasing either manually or automatically is usually less effort and lower service costs compared to oil.
In some cases, even life time lubrication is possible using grease.

Puma offers a wide variety of high-performance greases for a broad range of applications.
Currently over 80% of all greases used are based on a thickener technology using Lithium. Lithium based thickeners are very versatile and can be used in numerous applications.
However, the future for lithium technology for use in greases is under very high pressure. Due to electrification and the increase need for batteries is causing a steep price increases for lithium as well as a shortage of lithium.
The lubricant industry has to change to alternative grease thickener technologies and we at Puma have been forthcoming on the new demands and requirements.
We are currently in the position to provide alternative solutions using different thickener technologies mitigating the cost increase and the availability issues with lithium.

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Lithium and Beyond: Puma's Quest for Sustainable Lubrication Technology

Most people are oblivious to the fact that they use at least one product containing lithium every day. Demand for lithium is expected to grow by 25% per annum in the 10 years between 2020 and 2030 – but, as demand skyrockets, so too will price. At present, there is no way to address this challenge, because there is no low-cost supply of the element – nor are we likely to find one in the foreseeable future.

Puma Energy, a global leader in Lubricant technology, is at the forefront of managing macro market movements and is actively working on new and better solutions for their Clients, to mitigate the potential cost increases resulting from Lithium demand growth.

Lithium is a crucial component for ensuring that machinery of all types works properly. Simply put, the moving parts of any machine require lubrication to reduce friction. This, in turn, prevents excessive wear and tear. While many different kinds of lubricants may be used to fulfil this function, grease is one of the most important, and is used in more than 80% of all applications, making it an essential part of the lubricant industry.

A grease is, essentially, a fluid (like an oil) that has been thickened by a thickener system so that it doesn't slip and slide over the part it is supposed to lubricate. Thickener systems aren't vastly dissimilar from the soap we use in our households, because they are based on metal soap chemistry, where metal is employed to interact with the fatty acid of the grease. In most cases, the element of choice in this process is lithium: in fact, the chemical is used as the metal soap thickener in 80% of all greases worldwide, thanks to its versatility and multi-purpose technology.

Of course, this is not the only use for lithium.

However, with demand for this chemical element set to grow, placing pressure on costs, questions are arising around the sustainability of the industry. If we are unable to find additional sources of lithium, we can at least find alternatives to lithium technology – and this is precisely what Puma is doing, together with our technology partners.

Although it will be extremely difficult to replicate or replace the current application coverage of lithium with just one alternative technology, Puma Energy's work with anhydrous calcium and calcium sulfonate complex technologies has yielded exciting results, and shows that these elements can be used for several of the applications currently covered by lithium.

There are several advantages of using anhydrous calcium: it has exceptional low-temperature properties; can be used for a multitude of applications; can seal off fluids, dust, and debris; has good structural strength, and is non-toxic. It compares favourably to lithium in many areas (such as water resistance and use as a biofuel) and is equal to the element in many others.

This is just the beginning, however. Puma Energy is on a journey to uncover more innovative technologies that can provide better or additional performance, compared to lithium technology.

An exciting future is within reach.

Puma Victrix HD 1400-2 Grease

High Performance Heavy Duty Grease

Description

PUMA Victrix HD 1400-2 is a high performance heavy duty grease intended for use for a large variety of applications where high loads, slow speeds and sliding friction prevail. It is based on mineral oil with polymers and uses Anhydrous Calcium thickener technology

Usages

In conjunction with a high base oil viscosity, a proprietary blend of lubricating solids the grease provides extremely high load carrying capabilities. PUMA Victrix HD 1400-2 grease also contains antioxidants and corrosion inhibitors and is especially well suited in wet and corrosive environments. The grease has excellent adhesiveness and water resistance.

Typical characteristics of the product

Property	Test Method	Unit	PUMA Victrix HD 1400-2
Thickener			Anhydrous Calcium
Base fluid			Mineral oil/ Polymer
Lubricating Solids			Special blend of Graphite and MoS2
Colour	Visual		Dark Grey
NLGI Grade	ASTM D-217		2
Worked Penetration 60 DS	ISO 2137		265 - 295
Dropping point	IP 396	°C	>140
Base oil viscosity at 40°C	ASTM D-7152	mm2/s (cSt)	1370
Base oil viscosity at 100°C	ASTM D-7152	mm2/s (cSt)	95
4-bal weld load	DIN 51350:4	N	>3600
Water resistance at 90°C	DIN 51807:1		0-1
Water wash out at 79°C	ISO 11009	%	<10
Flow pressure at -20°C	DIN 51805 mod	mbar	<1400
Operating temperature range		°C	-30 to +120 (max. +130)

These characteristics are typical of current product methods whilst future production will conform to Puma Lubricants specifications, variations in these physical characteristics may occur. Please request the Technical Data Sheet for more detailed information.

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Puma Lithium EP Greases

High Performance Lithium Greases

Description

PUMA Lithium Series High Performance Grease are intended for use for a large variety of applications operating at high loads, medium to high speeds, ambient to elevated temperatures. It is based on mineral oil and uses the latest Lithium 12-hydroxy-stearate thickener technology.

Usages

Puma Lithium Series grease cover a wide range of applications. PUMA Lithium Series grease also contain antioxidants and corrosion inhibitors. Puma Lithium SLS-200-2 contains self-lubricating-solids for high load, high shock load and sliding friction applications. The wide range of NLGI grades makes the product suitable for plant wide use.

Typical characteristics of the product

Property	Test method	Unit	Puma EP 0	Puma EP 1	Puma EP 2	Puma EP 3	Puma Moly 2
Thickener			Lithium				
Base fluid			Mineral oil				
Texture			Smooth				
Colour	Visual		Yellow beige		Yellowish brown		Dark grey
NLGI grade	ASTM D-217 Mod.		0	1	2	3	2
Dropping point	IP 396	°C	> 160				
Base oil vscosity at 40°C	ASTM D-7152	mm2/s (cSt)	220				195
Lubricating solids			n/a				MoS2 3%
Worked penetration 60 DS	ISO 2137	1/10 mm	355 - 385	310 - 340	265 - 295	220 - 250	265 - 295
Timken OK Load	ISO 2891	kg	25				
Temperature range		°C	-30 to +120 max			-20 to +120 max	
Classification	DIN 51502		KP0K-20	KP1K-20	KP2K-20	KP3K-20	KPF2K-20
	ISO 6743/ 12924		L-XBCHB0	L-XBCHB1	L-XBCHB2	L-XBCHB3	L-XCCIB2

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Puma Supreme Lithium Complex Greases

High Performance Lithium Complex Greases

Description

PUMA Supreme Series High Performance Grease are heavy duty greases intended for use for a large variety of applications subject to high loads, medium to high speeds, elevated temperaturas, water ingress. It is based on mineral oil and uses the latest Lithium Complex thickener technology.

Usages

In conjunction with an effective range of base oil viscosities this grease covers a wide range of applications. PUMA Supreme Series High Performance Greases also contain antioxidants and corrosion inhibitors. Puma Supreme SLS-400-2 contains self-lubricating-solids for high load, high shock load and sliding motion applications.

Typical characteristics of the product

Property	Test method	Unit	BRB-220-2 EP	SLS-400-2 EP	SLS-500-2 EPM5
Thickener			Lithium Complex		
Base fluid			Mineral Oil		
Texture			Smooth		
NLGI grade	ASTM D-217 mod		2	2	2
Dropping point	IP 396	°C	> 260	> 260	> 260
Base oil vscosity at 40°C	ASTM D-7152/ ISO 12058	mm2/s (cSt)	210	400	500
Base oil vscosity at 100°C	ASTM D-7152/ ISO 12058	mm2/s (cSt)	16	25	30
Lubricating solids			n/a	MoS2	MoS2
Worked penetration 60 DS	ISO 2137	1/10 mm	265 - 295	265 - 295	265 - 295
4-Ball weld load	DIN 5135-4	N	2800	3000	
	ASTM D-2596	Kgf			400
Water resistance at 90°C	DIN 51807-1		1 - 90		
Emcor distilled water	ISO 11007		0 - 0		
Copper corrosion 24h/100°C	ASTM D-4048		1b		
SKF R2F at 140°C	SKF		Pass	n/a	n/a
Density at 20°C	IP 530	kg/m3	900	960	960
Temperature range		°C	-30 to +140 (max +180)	-20 to +140 (max +180)	-20 to +140 (max +180)
Classification	DIN 51502		KP2K-30	KP@K-30	
	ISO 6743/ 12924		L-XC(F)CHB2	ISO-L-XC(F)DIB2	
	NLGI specification		GC-LB		

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Industrial

Puma Supreme HD SLS-460-2 EP Lithium Complex Greases

Heavy Duty Lithium Complex Greases

Description

PUMA Supreme HD SLS-460-2 EP greases are high performance heavy duty greases intended for use for a large variety of applications where high loads, slow speeds and sliding friction prevail. It is based on mineral oil Lithium-Complex thickener and Self Lubricating Solids (SLS i.e MoS2 or a blend).

Usages

In conjunction with a high base oil viscosity and SLS the greases provide extremely high load carrying capabilities. PUMA Supreme HD SLS-460-2 EP greases also contain antioxidants and corrosion inhibitors and are especially well suited in wet and corrosive environments. The greases have excellent adhesiveness and water resistance.

Typical characteristics of the product

Test	Standard	Unit	"PUMA Supreme HD SLS-460-2 EP"	"PUMA Supreme HD SLS-460-2 EPM5"
Thickener			Lithium Complex	
Base fluid			Mineral Oil	
Lubricating Solids			Proprietary blend	5% MoS2
Colour	Visual		Black	
NLGI Grade	ASTM D-217		2	
Worked Penetration 60 DS	ISO 2137		265 - 295	
Dropping point	IP 396	°C	>260	
Base oil viscosity at 40°C	ASTM D-7152	mm2/s (cSt)	480	460
Base oil viscosity at 100°C	ASTM D-7152	mm2/s (cSt)	35.4	32
4-bal weld load	ASTM D-2266	kg	>620	>800
Water Washout, % loss	ASTM D-1264		<2	<2.5
Rust Test	ASTM D-1743		Pass	
Lincoln Ventmeter, 400psi	OEM Standard	°C	n/a	-10
Operating temperature range		°C	-10 to +170	-12 to +140

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Puma Radix Greases

High Performance Calcium Sulfonate Complex Greases

Description

PUMA Radix Series High Performance Grease are heavy duty greases intended for use for a large variety of applications where high loads, slow speeds, high temperaturas, high water ingress and sliding friction prevail. It is based on mineral oil with polymers and uses the latest Calcium-Sulfonate Complex thickener technology.

Usages

The thickener technology used in this grease contains built in conventional EP- and AW-additives providing inherent high load carrying capabilities. In conjunction with an effective range of base oil viscosities this grease covers a wide range of heavy duty applications. PUMA Radix Series High Performance Greases also contain antioxidants and corrosion inhibitors.

Typical characteristics of the product

Property	Test Method	Unit	PUMA Radix 200-2	PUMA Radix 400-1.5	PUMA Radix 400-1.5 LS
Thickener			Calcium Sulfonate Complex		
Base fluid			Mineral oil/ Polymer		
Colour	Visual		Brown	Brown	Black/ MoS2
Density	IP 530	kg/L	1000	990	990
NLGI Grade	ASTM D-217 mod		2	1.5	1.5
Worked Penetration 60 DS	ISO 2137		265 - 295	290 - 320	290 - 320
Dropping point	IP 396	°C	>280	>280	>280
Base oil viscosity at 40°C	ASTM D-7152	mm2/s (cSt)	200	390	390
Base oil viscosity at 100°C	ASTM D-7152	mm2/s (cSt)	15	24	24
4-bal weld load	DIN 51350:4	N	6500	6500	6500
SKF R2F B at 140°C	SKF		Pass	Pass	Pass
Water resistance at 90°C	DIN 51807:1		0-1	0-1	0-1
Emcor dist water	ISO 11007		0-0	0-0	0-0
Emcor salt water	ISO 11007		≤1-1	≤1-1	≤1-1
Emcor distilled water	ISO 11007		0 - 0		
Operating temperature range		°C	-30 to +140	-20 to +140	-20 to +140
		°C	(max. +180)	(max. +180)	(max. +180)
Classification	ISO 12924		L-XC(F)DIB2	L-XB(F)DIB1.5	L-XB(F)DIB1.5
	DIN 51502		KP2N-30	KP1.5N-20	KPF1.5N-20

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Puma Callit HD 2000 Grease

High Performance Heavy Duty Greases

Description

PUMA Callit HD 2000 is a high performance heavy duty grease intended for use for a large variety of applications where high loads, slow speeds and sliding friction prevail. It is based on mineral oil with polymers and uses the latest Lithium-Calcium Sulfonate Complex thickener technology.

Usages

This unique thickener technology contains built in conventional EP- and AW-additives providing inherent high load carrying capabilities. In conjunction with a high base oil viscosity, a high level of proprietary blend of lubricating solids the grease provides extremely high load carrying capabilities. PUMA Callit HD 2000 grease also contains antioxidants and corrosion inhibitors.

Typical characteristics of the product

Property	Test Method	Unit	PUMA Callit HD 2000
Thickener			Special Lithium/ Calcium Sulfonate Complex
Base fluid			Mineral oil/ Polymer
Texture	Visual		Smooth
Colour	Visual		Dark Grey
NLGI Grade	ASTM D-217 mod		1.5
Worked Penetration 60 DS	ISO 2137		290 - 320
Penetration drop after 105 DS		%	6
Dropping point	IP 396	°C	>280
Base oil viscosity at 40°C	ASTM D-7152	mm2/s (cSt)	2000
Base oil viscosity at 100°C	ASTM D-7152	mm2/s (cSt)	98
4-bal weld load	DIN 51350:4	N	>7500
Water resistance at 90°C	DIN 51807:1		0-1
Water wash out at 79°C	ISO 11009	%	1
Emcor salt water	ISO 11007		0-0
Flow pressure at -20°C	DIN 51805 mod	mbar	<1400
Operating temperature range		°C	-20 to +120 (max. +130)
Classification	ISO 12924		L-XB(F)CIB1.5
	DIN 51502		KPFHC1.5K-20

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PUMA Wire Rope Grease

Wire Rope Grease

Description

Puma Wire Rope grease is a new generation of wire rope lubrication ready to use directly onto wire ropes. It maintains low friction qualities with positive anti-wear protection and is designed not to fling off ropes. This allows for a cleaner and safer work environment.

Usages

Puma Wire Rope Grease is formulated to prolong the life of wire rope shears and support cables. This lubricant has anti-fretting and anti-corrosion additives providing full protection against corrosion and wear.

Typical characteristics of the product

Property	Units	Test Method	Puma Wire Rope
Colour		Visual	Grey
Texture			Grease
Dropping Point	°C	ASTM D-566	>200
Unworked Penetration	1/10mm	ISO 217	320-360
Rust Test		ASTM D-1743	PASS
Copper Corrosion		ASTM D-130	1

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Industrial

Open Gear Lubricants

There are 2 types of open gears:

Type I open gear is an actuator or rack system used to intermittently transmit power i.e. cable drums, excavation shovels or draglines, racks & pinions, crown gears etc.

Type II open gear is an actuator, usually a pinion and a gear, used to transmit power continuously i.e. rotary equipment like kilns, mills, de-barkers, rubber mills etc.

In the past both types could be lubricated with similar products. However, the last 2 decades, Type II open gears are more and more lubricated using gels, very heavy (synthetic) gear oils.

Type I open gear lubricants are still used to lubricate Type II open gears as well specifically in older equipment and/or worn gears.

Type I open gear lubricants need very high tackiness to stay on the gear flanks and at the same time must provide low friction film to provide good lubricant film preventing metal-to-metal contact preventing wear as well as reduce fatigue pitting. The film should be semi-dry preventing airborne dust to stick on the application.

Typical Type II open gear lubricants are not suitable to lubricate Type I.

The demand for improved efficiencies and cost reductions, Type II open gear lubricants are designed to provide low friction and very high load carrying and shock load capabilities.

Furthermore, low consumption is required, good drainability from gears and gear guards to remove dust and debris more efficiently as well as cleaner operation.

Modern technologies provide high performance gear protection and low friction to reduce wear, extend gear life and improve power efficiency.

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Puma Protego OGL

High Performance Heavy Duty Open Gear Lubricants

Description

PUMA Protego OGL series are formulated for use on open gears and other severe applications on draglines and mining shovels. They are also highly recommended for the open gears of kilns and mills.

Usages

The improved coating technology used in PUMA Protego OGL series meet the demand for an open gear lubricant that deposits a darker, non-translucent coating on metal surfaces and also meets the Caterpillar (formerly Bucyrus International) specification SD 4713. The dense black coating lets the operator know that the Lubricant is in place at the right quantity.

Specifications

Approvals

Komatsu Mining Germany AH11501s
Shovel models PC 3000, 4000, 5500, 7000 & 8000

Meets:

Meets the requirements of Caterpillar specification SD 4713.
PUMA Protego OGL Super Heavy is suitable for CAT Shovel Hoist Drum Gears, specification SD 4713 revision June 2011

Typical characteristics of the product

Property	Test Method	Unit	PUMA Protego OGL Heavy	PUMA Protego OGL Super Heavy
Thickener			Lithium	
Base fluid			Mineral oil/ Polymer	
Lubricating Solids			Proprietary Blend	
Colour	Visual		Black	
NLGI Grade	ASTM D-217		0	0-1
Kinematic Viscosity Base Oil at 40°C	ASTM D-445	mm2/s (cSt)	4,123	6,500
Kinematic Viscosity Base Oil at 100°C	ASTM D-445	mm2/s (cSt)	165	254
4-Ball EP, Weld Load	ASTM-D2596	kg	>1,000	
4-Ball Wear, Scar Width	ASTM D-2266	mm2/s (cSt)	<0.7	
Specific Gravity at 15.5°C		kg/l	1.0002	1.03
Flash Point (COC), Base Oil	ASTM D-92	°C	204	
Operating temperature range		°C	-12 to +120	-1 to +120

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PUMA Enviro OGL Heavy

High Performance Heavy Duty Open Gear Lubricant

PSF Technology Self-Healing, Low Friction, Easy Draining

Description

PUMA Enviro OGL Heavy is a proven, robust open gear lubricant used on Type II open gears (rotary equipment). It is free of heavy metals and asphalt, it is based on a blend of high viscosity petrolem distillate, synthetic polymer and resins.

Usages

The spent Lubricant does not harden over time which greatly simplifies cleanup. This unique product contains an additive technology based on PSF (Plastic Surface Formation) that further reduces friction and wear and promotes smoothing of contact surfaces.

Specifications

Meets:

Meets requirements of:

- Falk Corporation
- Metso Minerals
- FL Smidth

Typical characteristics of the product

Property	Test Method	Unit	PUMA Enviro OGL Heavy
Base fluid			Petroleum distillates/ synthetic polymer and resins
Base oil viscosity at 40°C	ASTM D-445	mm2/s (cSt)	>100,000
Base oil viscosity at 100°C	ASTM D-445	mm2/s (cSt)	1,100
Kinematic Viscosity (complete product), Base Oil Viscosity at 40°C	ASTM-D-445	mm2/s (cSt)	3,500 – 4,500
4-Ball EP, Weld Load	ASTM-D2783	kg	>800
4-Ball Wear, Scar Width	ASTM D-4172	mm2/s (cSt)	0.45
Specific Gravity, kg/l at 15.5°C		kg/l	0.896
Flash Point (COC), Base Oil	ASTM D-92	°C	174
Low Temperture Pumpability, Lincoln Ventmeter @ 400 psi, °C			-7
Coefficient of Friction			0.0551

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Puma SynFluid Gold OGL Super Heavy

Fully Synthetic High-Performance Heavy-Duty Open Gear Lubricant

Description

PUMA SynFluid Gold OGL Super Heavy is the ultimate solution to the problema of lubricating open gears and very slow-moving enclosed gears. It is a proven, robust open gear lubricant used on Type II open gears (rotary equipment).

Usages

Puma SynFluid Gold OGL Super Heavy is base don the unique PSF technology providing unsurpassed wear protection.
Puma SynFluid Gold OGL Super Heavy is clean, environmentally friendly, easy to work with and it protects even the most heavily loaded gears.
No lubricating solids are used hence the producto can be filtered for longer Service life.

PSF Technology, Clean & Easy, Effective

Specifications

Meets:

Meets requirements of:
- Falk Corporation
- Metso Minerals
- FL Smidth
- Outotec

Meets requirements of:
- Polysius
- Sinoma
- Amec Foster Wheeler
- Ferry Capitain

Typical characteristics of the product

Property	Temp	Units	Test Methods	"Puma SynFluid Gold OGL Super Heavy"
Viscosity Grade			ISO 3448	n/a
Kinematic Viscosity	40°C	mm2/s (cSt)	ASTM D-445	15,500
Kinematic Viscosity	100°C	mm2/s (cSt)	ASTM D-445	950
Viscosity Index			ASTM D-2270	265
Density	15.5 °C	g/ml	ASTM D-4052	0.84
Colour			Visual	Gold
Flash Point		°C	ASTM D-92	253
Pour Point		°C	ASTM D-97	-6
4-Ball Weld Load		kg	ASTM D-2783	>800
4-Ball Wear - Scar Width at 40 kgf		mm	ASTM D-4172	0.32
Rust Test - Distilled Water		Rating	ASTM D-665	Pass
Copper Strip Corrosion at 3 hours	100°C	Rating	ASTM D-130	1B
FZG Scuffing Loading Stage		FLS	ASTM D-5182	>12
FZG Specific Mass Loss After Stage 12		mg/kWh	ASTM D-5182	0.0199
Operating Temp		°C		-7 to 120

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Industrial

Turbine & Gas Engine Oils

Turbine and gas engine oils are typically used in power generation sites.

Modern turbine oils are based on Group II base oils to provide extended oxidation stability and longer oil life. Extreme pressure properties are required when a gear set is part of the lubrication system.

Good water separation properties as well as rust and corrosion protection are very important properties as well as air release/ ant-foam.

Gas burns hot causing severe oil stress, evolving gas engine design has resulted in higher combustion temperatures, better fuel economy and higher oxidation and nitration rates of the lubricating oil. Modern natural gas engine oils (NGEO) have superior resistance to oxidation and nitration.

Gas is 'dry' and needs lubricating oil ash to minimize valve wear, however, excessive ash can cause serious problems. There are no industry standards for NGEO quality. The API classification for automotive oils does NOT apply.

OEM specifications and field experience are key for defining oil quality. Some OEM list oils that meet their specifications. Sulphated ash is the primary consideration for NGEO selection.

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PUMA Turbine Oils

High Performance Industrial Steam- & Gas Turbine Oils

Description

Puma Turbine Oils has been developed to meet the widest range of requirements meeting the demands of most modern steam and light duty gas turbines. These oils are formulated from high quality group 2 base stocks and technology advanced additive packs that provide great performance against rust & corrosion prevention, excellent oxidative stability, low foaming and excellent demulsibility.

Usages

Puma Turbine Oils are modern high performance turbine oils formulated with hydro-treated base oils and selected additives.

- Combined Cycle Turbine Systems
- Steam Turbines
- Large Heavy Duty and smaller Gas Turbines
- Turbines with Heavy Load Gears

Anti-wear Protection, Rust & Oxidation Resistance, Demulsibility Performance

Specifications

Meets:

ASTM D-43054 (Type II)
DIN 51 524, Part 1 (HL), 51 515, Part 1, L-TD)
GEK 32568F, 109141A (FZG/ FLS=8), 28143A ,46506D
AFNOR E-48600, HL

BS 489
US Steel 120, 126
MIL-L-176672-D, -17331-B, -17331-G
Cincinnati Machine P-38, P45, P-55, P57

CEGB Standard 207001
Alsthom HTGD 90 117 V0001R 117
FZG FLS >9
ABB -Stal VTI 3200-3, 81 21 08
Westinghouse 21T0591 &

551255Z3
Siemens AG TLV 9013 04/ 01 (FZG/FLS =8)
Solar ES9-224U
JIS K 2213

Typical characteristics of the product

Property	Temp	Units	Test Method	Puma Turbine Oils			
ISO Viscosity Grade			ISO 3448	32	46	68	100
Colour Appearance			ASTM D-1500	C&B			
Kinematic Viscosity	40°C	mm2/s (cSt)	ASTM D-445	31.3	45.6	68.0	93.0
Kinematic Viscosity	100°	mm2/s (cSt)	ASTM D-445	5.3	6.8	8.0	10.9
Viscosity Index			ASTM D-4292	101	103	103	103
Flash Point (COC)		°C	ASTM D-92	>200	>220	>240	>240
Pour Point		°C	ASTM D-97	<-24			
Density	15°	g/ml	ASTM D-4052	0.870	0.858	0.88	0.88
Air Release	50°	min.	ASTM D-3427	1			
Water Separation		min.	ASTM D-1401	3			
Rust Protection			ASTM D-665B	Pass			
Oxidation Stability - TOST life		hrs.	ASTM D-943	>10,000			
FZG A/8.3/90		FLS	DIN 51 354	>12			

These characteristics are typical of current product methods whilst future production will conform to Puma Lubricants specifications, variations in these physical characteristics may occur. Please request the Technical Data Sheet for more detailed information.

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Puma LA Natural Gas S 40

Low Ash Natural Gas Engine Oil

Description

Puma LA Natural Gas S engine oil is formulated using Group II base oil and latest additive technology which provides unsurpassed engine cleanliness, very low piston deposit, reduced sludge formation improved soot handling, excellent wear protection. Offers optimized performance for the latest generation gas engines.

Usages

Puma LA Natural Gas S engine oil is also recommended for the lubrication of:

- Spark Ignition
- Natural Gas
- Biogas

Anti-wear Protection, Oxidation Resistance, Anti-foam Performance

Specifications

Approvals

- INNIO Jenbacher: Type 2 / 3 /4 (versions A, B & C) /6 (versions C, E, F & J) including steel piston versions (4C, 6F & 6J).
- INNIO Jenbacher Natural Gas
- INNIO Waukesha engines

Meets:

- MWM – Natural Gas / Biogas
- Wärtsilä
- Caterpillar (proof of performance 3500 & 3600)

Typical characteristics of the product

Property	Temp	Units	Test Method	Puma LA Natural Gas S 40
Viscosity Grade		SAE	J300	40
Kinematic Viscosity	40°C	cSt	ASTM D-445	120
Kinematic Viscosity	100°C	cSt	ASTM D-445	13.1
Viscosity Index	-	-	ASTM D-2270	105
Density	15°C	kg/L	ASTM D-4052	0.875
Total Base No	-	mg KOH/g	ASTM D-2896	5.6
Sulphated Ash	-	%	ASTM D-874	0.45
Flash Point (COC)	-	°C	ASTM D-92	>240
Pour Point	-	°C	ASTM D-97	-24

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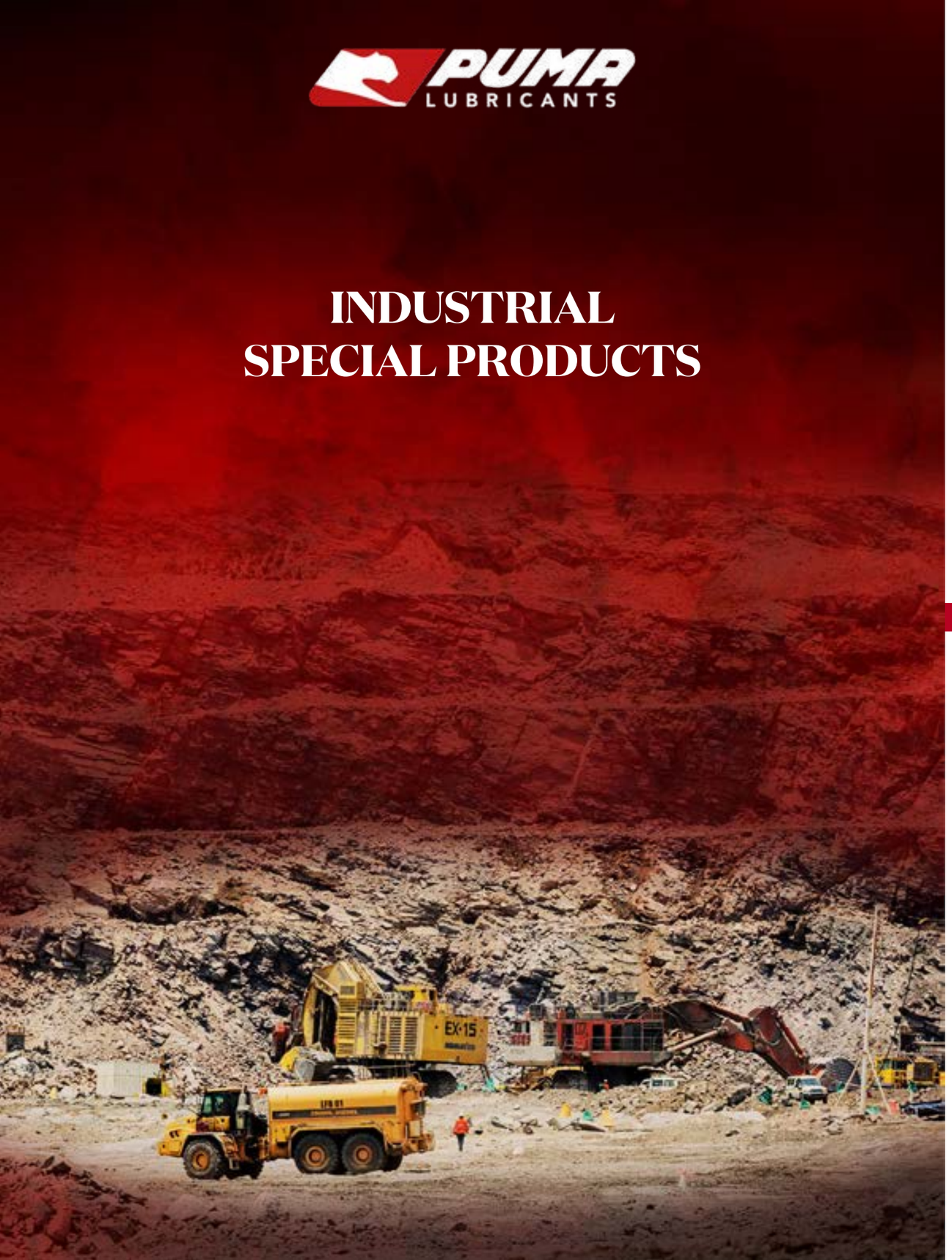

INDUSTRIAL SPECIAL PRODUCTS

PUMA CamLub

High Performance Monighan Cam Lubricant

Description

PUMA CamLub is base don a proprietary technology providing durable Lubricant protection and all-season pumpability without the use of solvents.

Usages

PUMA CamLub meets the EPA Toxicity Characteristic Leaching Procedure (TCLP) and is characterized as TCLP-SAFE. Non-Halide formulation.

Extreme Tackiness, Very Low Cam Vibrations, Solvent Free

Typical characteristics of the product

Property	Units	Test Method	Puma Wire Rope
Worked Cone Penetration		ASTM D-217	Grey
NLGI Grade			Grease
Kinematic Viscosity (Base Oil) at 40°C	mm2/s (cSt)	ASTM D-445	>200
Cone Penetration (worked)		ASTM D-217	320-360
4-Ball EP, Weld Load	kg	ASTM D-2783	PASS
Specific Gravity at 15.5°C	kg/l	Gardner Method	
Flash Point (COC)	°C	ASTM D-92	1
Low temperature Pumpability Lincoln Ventmeter @600psi	°C	OEM Standard	

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PUMA Uninhibited Transformer Oil

Transformer Fluid Uninhibited

Description

Puma Transformer Oil is especially developed for use in oil-filled electrical equipment – including power and distribution transformers, rectifiers, circuit breakers and switch-gears

Usages

This insulating oil meets and exceeds the toughest demands on dielectric strength when stored and handled correctly.

Uninhibited, Insulating Oil, Low Start Temperature

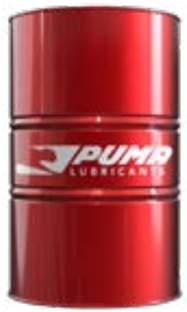
Specifications

Meets:

NRS 079-1:2004
IEC 60296 Edition 4

Typical characteristics of the product

Physical Property	Unit	Test Method	Specification Limits		Typical Data
			MIN	MAX	
Appearance		IEC 60296	Clear, free from sediment		Complies
Density, 20 C	kg/dm3	ISO 12185		0.895	0.883
Viscosity, 40 C	mm2/s	ISO 3104		11	9.2
Colour		ASTM D-1500		0.5	<0.5
Aniline point	C	ASTM D-611	63	84	76
Pour Point	C	ISO 3016		-40	-57
Number of particles per 100 ml		IEC 60970			
-On delivery				130000 particles >5	<130000 particles >5
				16000 particles >15 or	<16000 particles >15 or
				17/14 (ISO rating)	17/14 (ISO rating)



These characteristics are typical of current product methods whilst future production will conform to Puma Lubricants specifications, variations in these physical characteristics may occur. Please request the Technical Data Sheet for more detailed information.

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Puma Inhibited Transformer Oil

Transformer Fluid Inhibited

Description

Puma Transformer Oil is especially developed for use in oil-filled electrical equipment – including power and distribution transformers, rectifiers, circuit breakers and switch-gears

Usages

This insulating oil meets and exceeds the toughest demands on dielectric strength when stored and handled correctly.

Inhibited, Insulating Oil, Longer Life

Specifications

Meets:

NRS 079-1:2004

Typical characteristics of the product

Physical Property	Unit	Test Method	Specification Limits		Typical Data
			MIN	MAX	
Appearance		IEC 60296	Clear, free from sediment		Complies
Density, 20 C	kg/dm3	ISO 12185		0.895	0.883
Viscosity, 40 C	mm2/s	ISO 3104		11	9.2
Colour		ASTM D-1500		0.5	<0.5
Aniline point	C	ASTM D-611	63	84	76
Pour Point	C	ISO 3016		-40	-57
Number of particles per 100 ml		IEC 60970			
-On delivery				130000 particles >5	<130000 particles >5
				16000 particles >15 or	<16000 particles >15 or
				17/14 (ISO rating)	17/14 (ISO rating)

These characteristics are typical of current product methods whilst future production will conform to Puma Lubricants specifications, variations in these physical characteristics may occur. Please request the Technical Data Sheet for more detailed information.

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PUMA Heat Transfer Oil

Heat Transfer Fluid

Description

Puma Heat Transfer Oil is used for filling heat transfer units. It has excellent oxidation stability and withstands thermal decomposition. It is formulated from carefully selected paraffinic base stocks.

Usages

Puma Heat Transfer 32 can be used in all “open” or “closed” type units with:

Maximum boiler outlet temp: 300°C
Maximum boiler wall temp: 315°C

Prevents Deposits & Sludge, Oxidation Stability, High Temperature Resistant

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma Heat Transfer Oil
ISO Viscosity Grade	-	-	ISO 3448	32
Kinematic Viscosity	40°C	mm2/s (cSt)	ASTM D-445	30
Kinematic Viscosity	100°C	mm2/s (cSt)	ASTM D-445	5.3
Viscosity Index	-	-	ASTM D-2270	107
Flash Point (COC)	-	°C	ASTM D-92	215
Pour Point	-	°C	ASTM D-97	-12
Density	-	g/ml	ASTM D-4052	0.87

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Puma HD WRL 68

High Performance Wire Rope Lubricant

Description

Puma HP Wire Rope Lubricant is developed to perform as a premium quality wire rope lubricant in open cast and underground mining operations where maximum rope life must be achieved despite harsh operating conditions.

Usages

Puma HP Wire Rope Lubricant is an environmentally acceptable rope lube that does not contain solvents, lead, barium, zinc, antimony or other ecologically undesirable additives. It is designed for use on dragline hoist and drag ropes, shovel hoist and crowd ropes, winder and guide suspension cables and crane hoist ropes.

Penetrates Rope Core, Water Resistant Corrosion Protection, Non-Fling

Typical characteristics of the product

Property	Temp	Unit	Test Method	PUMA HP WRL 68
Appearance				Transparent yellow fluid
Base fluid				Mineral oil & tackyfier
Specific Gravity	15°C	g/ml	DIN 51757,	0.873
Viscosity	40°C	mm2/s (cSt)	DIN 51366	68
	100°C	mm2/s (cSt)	DIN 51366	8.7
Viscosity Index			ISO 2909	100
Flashpoint		°C	ISO 2992	>190
Pourpoint		°C	ISO 3016	-6
Rust test, Test A & B		rating	DIN 51585A	0
Demulsibility, 40/40/0		min	ISO 6614	10
4-Ball wear test, wear scar dia.		mm	DIN 51350-03-B	0.3
FZG test, A/8.3/90		FLS	DIN 51354	>12

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PUMA Rock Drill Oils

Rock Drill Circulation Lubrication Systems

Description

Puma Rock Drill Oil is specially formulated with selected highly refined mineral oils, tackifiers, corrosion inhibitors and emulsifiers.

Usages

It is recommended for most machinery lubricated by means of oil circulation systems. Its applications may vary in Mining, quarrying, Construction, Roadworks, tunnelling and excavations. Available in ISO 150, 320

Corrosion Protection, Oxidation Resistance, Tackyness

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma Rock Drill Oils	
ISO Viscosity Grade	-	-	ISO 3448	150	320
Kinematic Viscosity	40°C	mm2/s (cSt)	ASTM D-445	150	320
Kinematic Viscosity	100°C	mm2/s (cSt)	ASTM D-445	14.4	24.6
Viscosity Index	-	-	ASTM D-2270	93	98
Flash Point (COC)	-	°C	ASTM D-92	265	265
Pour Point	-	°C	ASTM D-97	-18	-15
Density	-	g/ml	ASTM D-4052	0.89	0.9

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Puma Soluble Oil

High Lubricity Chlorine-Free Long-Life Soluble Oil

Description

Puma Soluble Oil is a water miscible mineral oil-based metal cutting fluid for universal applications. Biocide, Boron, Chlorine free. No Monday-morning smell.
The most versatile high-performance metal cutting fluid. Superior surface finish, tool life and sump life

Usages

Puma Soluble Oil is suitable for the use in normal to heavy duty machining applications. Wide variety of metal cutting processes including grinding, machining, drilling including gun drilling hot/ cold rolling. It is also suitable for machining non-ferrous metals (copper/ aluminium) as well as Titanium, Stainless Steel. Non-staining to aluminium. Puma Soluble Oil does not contain biocides, silicon, boron and amines.

WAter Based, Biocide Boron Chorine Free, No Monday Morning Smell

Typical characteristics of the product

Property	Temp	Units	Test Method	Puma Soluble Oil
Total Oil Content		%		80
Kinematic Viscosity	20 °C	mm2/ s (cSt)	ASTM D-445	140
Density	15 °C	kg/l	ASTM D-4052	0.902
pH Value			DIN 51369	9.2
Corrosion Test		Rating	DIN 51360-T2	0.0

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Puma High Efficiency Filter Carts

Robust Filter Carts

Description

Models Puma FC 125, Puma FC 310
Robust and reliable
Easy to manipulate
Using top world class filters and components
Ensure rapid cleaning even once through (top-up or oil transfer)

Usages

Cart:
- Robust gear pump, options 12.6 l/min or 30.8 l/min, integrated relief valve
- E-motor 220V, optional 380 V
- 4-meter reinforced suction hose and delivery hose with isolation valves
- Sampling valve on filter outlet

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Industrial

Puma Desiccant Breathers

Robust Filter Carts

Description

Puma Desiccant Breather is a filtration device that prevents moisture and contaminants from entering mechanical systems. It uses a desiccant material to absorb moisture, ensuring the equipment remains dry and operational. This component plays a vital role in prolonging machinery lifespan and minimizing maintenance costs in industrial applications.

Usages

Desiccant breathers are designed to replace the traditional vent cap on lubricant reservoirs.

Up to 80% of the moisture in a gearbox, hydraulic system or circulating lubrication system enters through the vent .

Benefits
- Extends the service life of lubricants and oil filters
- Eliminates condensation / rust formation
- Improve equipment and plant efficiency

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The information contained herein is accurate at the time of this review. However specifications change from time to time. Ensure specifications meet equipment manufacture requirements.Document No: 01/03/2017 | Printed copies are UNCONTROLLED

Marine Lubricants

Marine lubricants usually mainly reflect to engine oils for 2-stroke low speed main engine oils for cylinder lubrication and system oil and for 4-stroke medium speed trunk piston engine oils.
MCL – Marine Cylinder Oil (2-stroke)
TPEO – Trunk Piston Engine Oil (4-stroke)
The 2-stroke low speed engines (60 – 250 rpm) are used for propulsion whereby the 4-stroke medium speed engines (400 – 1000 rpm) are used for propulsion and/or generators.
High speed engines (>1000 rpm) are used for emergency equipment.
Coastal marine usually smaller vessels mainly use trunk piston engines or even high speed engines.

The fuel quality and especially the sulphur level plays a crucial role in the selection of the correct oil.
Sulphur levels can be > 3% the selection is therefore mainly based on the required TBN of the oil.
However, since January 1st 2020 the IMO (International Maritime Organization) implemented a global Sulphur Cap of max. 0.5% sulphur content allowed in the fuel.
In case of higher sulphur levels, the vessel must be equipped with a so-called exhaust gas scrubber.
Hence, more and more distillates (diesel fuel) are being used although the number of vessels equipped with scrubbers is still growing.
New developments are taking place to improve the environmental sustainability of marine vessels. Currently R&D at several engine manufacturers investigate the use of ammonia as fuel. In case of successful development, engine oils for this type of engines will be completely different compared to the current engine oils used.

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Revolutionizing Marine Engine Oils: A Case Study on Puma's Advanced TPEO Series

In 2018 and 2019, Puma released a new line of marine engine oils based on patented detergent technology. The following case study, based on tests conducted on a ferry used in Europe and a cement carrier operating in Greece, Turkey and Italy, shows the efficacy, cleanliness and efficiency of these products.

Subhead: Purpose
The introduction of Puma's Marine TPEO Series Oil is significant for several reasons. Promising to deliver superb engine cleanliness and a reduction in consumption, along with reduced component wear, the oils were intended as an alternative to the poor quality fuels commonly used by marine engine operators.

One of the standout features of such fuels is the level of sulphur and residuals which far exceed the sulphur cap of 0.5% imposed by the International Maritime Organisation in 2020. Heavy Fuel Oils (HFOs) are still widely used in conjunction with exhaust gas scrubbers.

In order to operate optimally, with low engine oil consumption, low wear on components and optimum fuel efficiency, an engine must be clean. Poor quality fuels compromise engine cleanliness: apart from engine fouling, they contribute to the build up of soot and deposit, which hampers engine efficiency and increases the wear on engine components

Puma Marine Advanced TPEO Series Oil is specifically recommended for application in four-stroke diesel engines operating on poor quality, high sulphur, residual fuels.It is also recommended in applications where a single product is preferred to lubricate engine operation on fuel oil, diesel fuel and dual fuel.

The efficacy of the product stems from the base oils used in its development. These are all high quality Group I oils, selected because they offer better solvency for additives as well as sludge and deposits along with better detergency, and have a lower tendency to form varnish.

The additive technology used in the formulation of Puma Marine Advanced TPEO Series Oils is also noteworthy. Making use of a patented technology, based on specific long chain Carboxylate detergents instead of the more commonly used short chain Salicylates detergents, it offers superior affinity with and adhesiveness on metal surfaces, and also dissolves asphatelenes more effectively. Soot and sludge are also controlled more efficiencly. Filtration ability is markedly improved, and oil stability is positively impacted by better oil solubility. The formula further contains effective dispersants and wear protection technologies.

A series of tests carried out during the OEM approval procedures on the four-stroke trunk piston engines from MAN Energy Solutions Augsburg and Wärtsilä Finland Oy has shown that Puma's Marine TEPO Series Oil addresses these challenges effectively, making it a vastly superior option.

The test and results

Tests conducted to show the efficacy and performance of Puma Marine Advanced TPEO 4040 in trunk piston engines showed that the fuel is an excellent choice for both power generation and marine applications.

The oil was tested on a Wärtsilä 8L engine on a cement carrier operating in Greece, Turkey and Israel, with 5 800kW power and an engine speed of 600rpm. The engine was operated for 10 days, with two days off, and carried a load of more than 80% on average. The test had a duration of 4 000 hours.

This test proved the claims made by Puma. Examination of the cylinders revealed that there was no visible wear, while the cylinder walls and piston top were clean with no sign of residue or carbon.

The cleanliness of the engine was also noteworthy. At the beginning of the test, the engine was remarkably dirty. Over the 3 000 hours that the engine was in use, it was cleaned by the oil, with all residue, varnish and carbon deposits removed.

The third factor to be tested was oil consumption. At the start of the test, the engine consumed between 0.55-0.60 g/kWh. By the test's conclusion, oil usage stood at 7 800 litres in 2 792 hours; equivalent to 7 020kg over that period. The engine power of 5 800kW (operating with an 80% load), which translates to an oil consumption of 0.43 g/kWh at 100% MCR, or 0.54 kWh at 80% - a truly impressive result.

Further proof

A second test saw Puma Marine Advanced TPEO 4040 used in a MAN 8L engine on a ferry. The engine's power stood at 4 800 kW, with a speed of 750 rpm. The engine was in use throughout the day, while the ferry operated with an average load of 90%. The test was 6 000 hours in duration, and data was recorded halfway through and again at its conclusion.

Again, results were outstanding. Most noteworthy was the lack of visible wear on the cylinders following a borescope inspection, while there was no sign of the Top-Dead-Centre. Honing grooves were clearly visible, and there was no residue on the cylinder walls or pistol tops. All told, the components looked as if they were new.

Oil consumption was, once more, very low. According to the latest log report, oil usage averaged 9 220 litres in 5 348 hours (equal to 8 390 kg). With the engine operating at 4 800 kW with a 90% load, this translates to an oil consumption of 0.33 g/Kwh at 100% MCR or 0.36 g/kWh at 90% MCR. This is regarded as an excellent result.

The results for tests related to wear can also be regarded as excellent: at 2 µm/ 1,000h wear was well below the maximum limit of 10 µm/ 1,000hrs.

A final observation was the cleanliness of the oil itself: after 6 500 hours, it was still in an excellent condition, and was drained to be used in another MAN engine on the same vessel

Puma Marine Cylinder Oils

Puma Cylinder Oil for 2-Stroke Engines

Description

Puma Marine Cylinder Oils provide exceptional performance especially at higher temperatures and mechanical loads and at slow steaming operation in modern and older marine 2-stroke engines. These SAE 50 oils are engineered for cylinder lubrication of marine and power generation slow speed 2 stroke engines.

Usages

Puma Marine Cylinder Oils are specially formulated and balanced products ensuring good control of detergency, wear, oxidation at the Base Number required. Therefore PUMA Marine Cylinder Oils will clean the engine, keep it clean providing the optimum engine efficiency combined with lowest specific engine oil consumption.

Specifications

Approvals:

- MAN Energy Solutions (previous MAN Diesel & Turbo)
- Winterthur Gas & Diesel (Win GD) (previous Wärtsilä)

Typical characteristics of the product

Typical Characteristics			PUMA Marine Cylinder Oil					
Property	**Test Method**	**Unit**	**25***	**40**	**50**	**70***	**100***	**140**
Viscosity Grade	J300	SAE	50					
Kinematic Viscosity at 40°C	ASTM D-445	mm2/s (cSt)	211					
Kinematic Viscosity at 100°C	ASTM D-445	mm2/s (cSt)	19.5					
Viscosity Index	ASTM D-4292		100					
Flash Point (COC)	ASTM D-92	°C	> 210					
Pour Point	ASTM D-97	°C	-24					
Density at 15°C	ASTM D-1598	kg/l	0.930					
TBN	ASTM D-2869	mgKOH/g	25	40	50	70	100	140

These characteristics are typical of current product methods whilst future production will conform to Puma Lubricants specifications, variations in these physical characteristics may occur. Please request the Technical Data Sheet for more detailed information.

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Puma Marine System Oils TBN 5 SAE 30

Puma Highly Rated Marine Crosshead Diesel Engine

Description

Puma Marine System Oil provides good demulsibility, water tolerance and water separation with regard to seawater and fresh water ingress. It provides high thermal stability and good oxidation resistance. It has adequate alkalinity to combat acidic corrosive wear.

Usages

Puma Marine System Oil TBN 5 SAE 30Meets the requirements of a System-lubricant by major manufacturers of crosshead-type of marine diesel engines

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma Marine System Oil 30
Viscosity Grade		SAE	J300	30
Kinematic Viscosity	40°C	cSt	ASTM D-445	102
Kinematic Viscosity	100°C	cSt	ASTM D-445	11.5
Viscosity Index			ASTM D-4292	100
Flash Point (COC)		°C	ASTM D-92	>210
Pour Point		°C	ASTM D-97	<-9
Density	@ 15 °C	kg/m3	ASTM D-4052	890
TBN		mgKOH/g	ASTM D-2896	5
"FZG Gear Test (A/8.3/90)"		FLS	DIN 51354	11

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Puma Marine Advanced TPEO Series

High Efficiency Trunk Piston Engine Oils

Patented Technology, Lowest Black Sludge Deposit, Lowest Specific Oil Consumption

Description

Puma Marine Advanced TPEO series are engine oils intended for use in four-stroke diesel engines, trunk piston engines used in marine and power generation.

Usages

The additive technology used in Puma Marine Advanced TPEO series oils is based on a unique patented detergent additive technology. The unique technology used provides the lowest Black Sludge Deposit (BSD) properties in conjunction with unsurpassed wear protection. Therefore PUMA Marine Advanced TPEO will clean the engine, keep it clean providing the optimum engine efficiency combined with lowest specific engine oil consumption.

Specifications

Approvals:

MAN Energy Solutions – Augsburg/ Germany
Wärtsilä Finland Oy

Typical characteristics of the product

Typical Characteristics			PUMA Marine Advanced TPEO						
Property	**Test Method**	**Unit**	**3012**	**3015**	**3020***	**3030***	**3040***	**3050***	**3055***
Viscosity Grade	J300	SAE	30						
Kinematic Viscosity at 40°C	ASTM D-445	mm2/s (cSt)	109						
Kinematic Viscosity at 100°C	ASTM D-445	mm2/s (cSt)	11.5						
Viscosity Index	ASTM D-4292		100						
Flash Point (COC)	ASTM D-92	°C	> 210						
Pour Point	ASTM D-97	°C	-21						
Density at 15°C	ASTM D-1598	kg/l	0.895	0.897	0.900	0.906	0.912	0.918	0.922
TBN	ASTM D-2869	mgKOH/g	12	15	20	30	40	50	55

These characteristics are typical of current product methods whilst future production will conform to Puma Lubricants specifications, variations in these physical characteristics may occur. Please request the Technical Data Sheet for more detailed information.

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Puma Marine Callit HD 2000

High Performance Heavy Duty Grease

Description

PUMA Marine Callit HD 2000 is a high performance heavy duty grease intended for use for a large variety of applications where high loads, slow speeds and sliding friction prevail. It is based on mineral oil with polymers and uses the latest Lithium-Calcium Sulfonate Complex thickener technology.

Usages

This unique thickener technology contains built in conventional EP- and AW-additives providing inherent high load carrying capabilities. In conjunction with a high base oil viscosity, a high level of proprietary blend of lubricating solids the grease provides extremely high load carrying capabilities. PUMA Marine Callit HD 2000 grease also contains antioxidants and corrosion inhibitors.

Typical characteristics of the product

Property	Test Method	Unit	PUMA Marine Callit HD 2000
Thickener			Special Lithium/ Calcium Sulfonate Complex
Base fluid			Mineral oil/ Polymer
Colour	Visual		Dark Grey
NLGI Grade	ASTM D-217 mod		1.5
Worked Penetration 60 DS	ISO 2137		290 - 320
Penetration drop after 105 DS		%	6
Dropping point	IP 396	°C	>280
Base oil viscosity at 40°C	ASTM D-7152	mm2/s (cSt)	2000
Base oil viscosity at 100°C	ASTM D-7152	mm2/s (cSt)	98
4-bal weld load	DIN 51350:4	N	>7500
Water resistance at 90°C	DIN 51807:1		0-1
Water wash out at 79°C	ISO 11009	%	1
Emcor salt water	ISO 11007		0-0
Flow pressure at -20°C	DIN 51805 mod	mbar	<1400
Operating temperature range		°C	-20 to +120 (max. +130)
Classifications	ISO 12924		L-XB(F)CIB1.5
	DIN 51502		KPFHC1.5K-20

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Puma Bio EP 2 Grease

High Performance EP 2 Grease, Environmentally Accepted Lubricating Grease (EAL)

Description

PUMA Bio EP 2 is a premium high performance Anhydrous Calcium thickened lubricating Grease inyended for a large variety of applications. It is base don biodegradable esters and contains anti- oxidants, corrosion inhibitors and extreme pressure/ anti-wear additives.

Usages

Puma Bio EP 2 grease was designed for lubricating heavily loaded bearings and in wet and corrosive environments even at low temperatures and it has excellent adhesión and water resistant properties.
Puma Bio EP 2 grease is designed for marine on-deck applications and serves as an universal grease for marine, forestry, agriculture and contruction equipment. The grease is easily pumpable in most centralized lubrication systems.

Typical characteristics of the product

Property	Test Method	Unit	PUMA Bio EP 2
Thickener			Anhydrous Calcium
Base fluid			Ester
Texture	Visual		Smooth
Colour	Visual		Yellow
NLGI Grade	ASTM D-217		2
Biodegradability	OECD-301B	%	65
Worked Penetration 60 DS	ISO 2137		265 - 295
Dropping point	IP 396	°C	>140
Base oil viscosity at 40°C	ASTM D-7152	mm2/s (cSt)	500
Base oil viscosity at 100°C	ASTM D-7152	mm2/s (cSt)	53
SKF R2F B at 100°C	SKF		Pass
4-bal weld load	DIN 51350:4	N	3200
Water resistance at 90°C	DIN 51807:1		0
Water wash out at 38°C	ISO 11009	%	2
Emcor salt water	ISO 11007		<2-2
Flow pressure at -40°C	DIN 51805 mod	mbar	<1400

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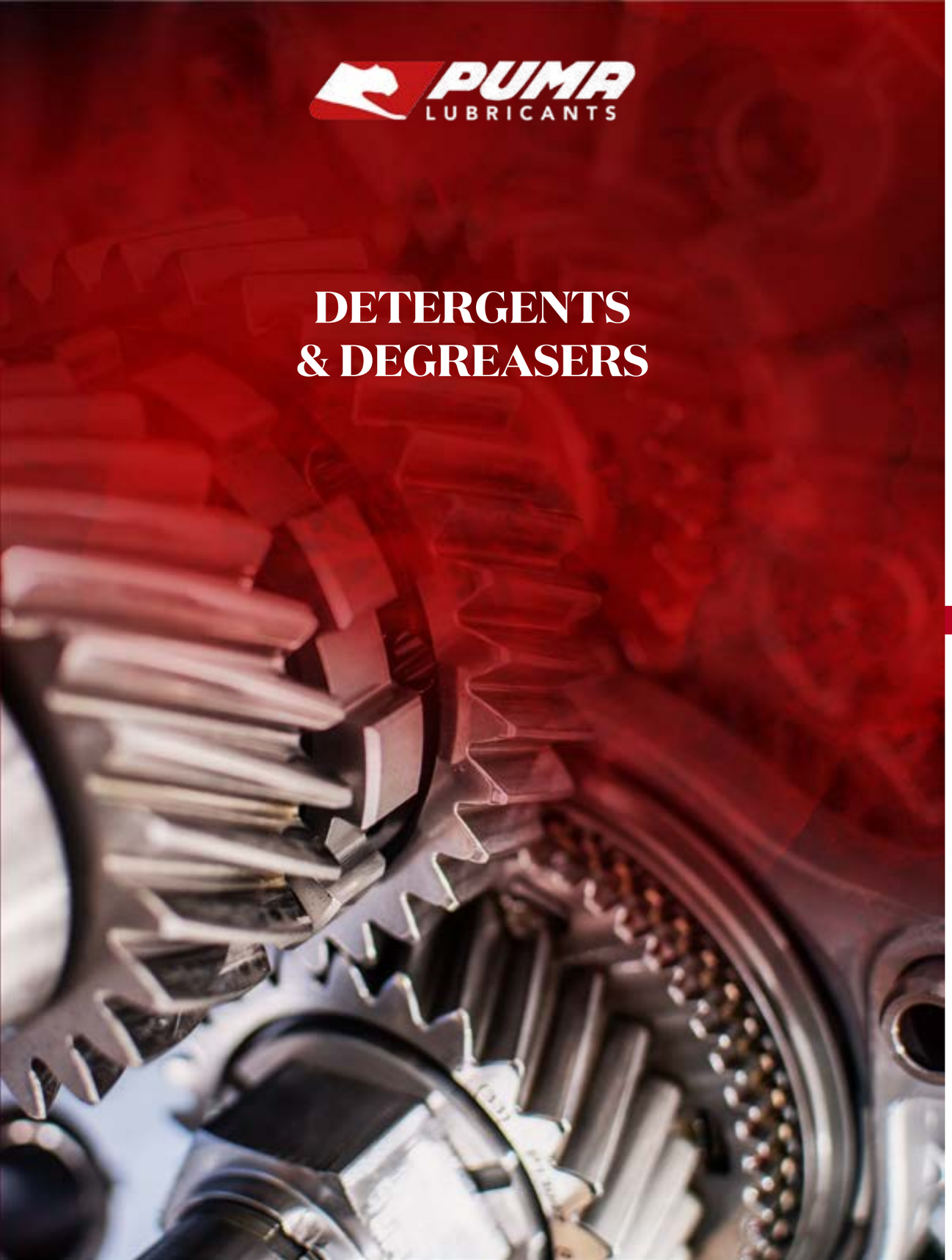

DETERGENTS & DEGREASERS

Puma Extreme Cleaner

Water Based Degreaser

Description

Puma Extreme Degreaser is an aqueous detergent with a particularly aggressive action towards dirt. Puma Extreme Cleaner is not flammable, volatile or corrosive for plant operators. It does not contain solvents.

Usages

Puma Extreme Cleaner can be used for severe cleaning work (e.g. dewaxing, elimination of grease, sludge, etc.) or diluted up to a maximum of 2% in water, depending on the type and quantity of dirt to remove. For painted surfaces it is advisable to use the diluted product.

Aquous, Solvent Free

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma Extreme Cleaner
Color				Transparent
Ingredients				Synthetic detergents and phosphates
Flash Point (COC)		°C	ASTM D-92	Non-Flammable
Density	20 °C	kg/l	ASTM D-4052	0.933
Ph				13.7
Odour				Neutral

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Puma General Purpose Degreaser

Clear Water-Based Degreaser with High Alkalinity

Description

Puma General Purpose Degreaser is a clear water-based degreaser with high alkalinity, which renders it suitable as a medium duty general-purpose degreaser for most greasers.

Usages

Puma General Purpose Degreaser cleans most types of greases except those based on tar and bitumen. It is an excellent degreaser for graphite-based material at high dilution, it cleans concrete floors soiled with grease and oils. Its foam suspends dust and soil, which makes cleaned surfaces easy to rinse.

Water Based, General Purpose

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma General Purpose Cleaner
Appearance				Yellow
Density	20 °C	kg/l	ASTM 4052	0.801
Ph				11

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Puma Enviro Degreaser 14000

Designed for Very Dirty Surfaces

Description

Puma Wash & Wax has been designed for very dirty surfaces containing grease, oils and stubborn dirt. It has solvents that loosens and removes all different types of soiling dirt compared to ordinary detergents. Puma Wash & Wax complies with all SABS 1344 requirements.

Usages

Puma Enviro Degreaser 14000 is biodegradable and environmentally friendly. It is non-flammable and therefore ideal for use in mine site applications, around workshops and industry for both cleaning and degreasing. It is supplied in a concentrate form to minimize handling and freight costs.

Environmentally Friendly, Biodegradable, Non Flammable

Typical characteristics of the product

Property	Temp	Units	Test Methods	Puma Enviro Degreaser 14000
Appearance				Blue Liquid
Boilling Point		°C		100
Density	20 °C	kg/l	ASTM 4052	1.072
Ph				Nov-13
Odour				Detergent

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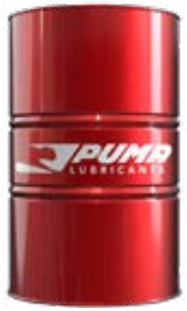

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