



CALTEX

Product Guide

- 🔹 Fuels
- 🔹 Lubricants
- 🔹 Specialties

November 2009



RRP \$14.95

Quick guide to Havoline® engine oils

Product	SAE	Code	API	API	ILSAC	ACEA	MB	VW
Havoline Fully Synthetic	5W-40	3032	SM	CF	-	A3/B3 A3/B4 C3	229.31	502.00, 505.00
Havoline Fully Synthetic C3	5W-30	3042	SM	CF	-	A3/B3 A3/B4 C3	-	-
Havoline Synthetic Blend	10W-40	3031	SM	CF	-	A3/B3	-	505.00
Havoline Premium Plus	10W-30	2967	SM	CF	GF-4	-	-	-
Havoline Extra	15W-40	2887	SL	CF	-	-	-	-
Havoline Premium	20W-50	1320	SL	CF	-	-	-	-
Havoline LPG	20W-50	2869	SL	CF	-	-	-	-
Havoline Ultra V	5W-30	3029	-	-	-	-	-	504.00 507.00
Havoline Classic	25W-60	2946	SG	CD	-	-	-	
Havoline Multigrade	20W-50	1459	SG	CD	-	-	-	

Quick guide to Delo engine oils

Product	SAE	Code	API	API	JASO	ACEA	MB
Delo 400 LE	15W-40	3006	CJ-4	SM		E7	228.31
Delo 400 Multigrade	15W-40	2696	CI-4+	SL	DH-1	E7, E5, E3	228.3
Delo Gold Plus	15W-40	3052	CI-4	SL		E7, E5, E3	228.3
Delo Gold Multigrade	15W-40	2894	CH-4	SL	DH-1*	E3	228.3
Delo Silver Multigrade	15W-40	2895	CG-4	SJ		E2	228.1
Delo Silver	30	2897	CF	SJ		E2	228.0
Delo Silver	40	2898	CF	SJ		E2	228.0
Delo XLD Multigrade	10W-40	2691	CF	-		E4	228.5
Delo HDD	40	1796	CF-2	-		-	
Delo HDD	50	1797	CF-2	-	-	-	

* Engine Tests

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Havoline® Fully Synthetic SAE 5W-40 3032

Synthetic Passenger Car Motor Oil

DESCRIPTION

Premium performance, multigrade motor oil formulated from selected synthetic base fluids and matching additive technology for use in passenger car and light truck gasoline and diesel engines under all operating conditions. It is a new generation product, formulated with reduced levels of metals and the elements phosphorus and sulfur to provide maximum durability of the latest low emission vehicle technologies and reduced emissions in all engines. It is optimised to provide complete engine protection plus ultimate performance.

Pack sizes: 205L, 20L, 5L, 1L.

APPLICATIONS

- Naturally aspirated and turbocharged gasoline and diesel engines in passenger cars.
- Light truck gasoline engines.
- Low emission passenger car and light duty vehicle engines fitted with latest catalytic converter (gasoline) or diesel particulate filter technology.
- Passenger car and light duty vehicles designed to meet Euro IV emission standards.
- Light vehicle gas-fuelled (Natural gas and CNG) spark ignition engines where the manufacturer recommends conventional passenger car motor oils.
- Four-stroke gasoline engines in portable power equipment where the manufacturer recommends conventional passenger car motor oils.

BENEFITS

Maximum engine life

Wider temperature capability of the synthetic base fluid ensures correct oil viscosity to reduce friction at start-up, and provides maximum lubricity during high temperature operation. Anti-wear additives minimise wear in sophisticated valve trains, including those with variable valve timing.

Reduced emissions

Low metal, phosphorus and sulfur formulation extends emission system durability and reduces the plugging rate of diesel particulate filters.

Maximum power and performance

Metallic detergent and ashless dispersant additives ensure maximum power and performance by controlling ring belt and piston skirt deposits, even under severe operating conditions. Special friction modifiers assist fuel economy.

Minimum maintenance costs

Thermal stability and oxidation resistance protect against in-service oil degradation which contributes to filter blocking and sludge formation in the oil galleries, crankcase and valve train.

Low oil consumption

Synthetic, highly shear-stable formulation improves control of oil flow through the ring belt area by maintaining oil viscosity, and reduces oil evaporation at the elevated ring zone temperatures.

PERFORMANCE STANDARDS

API	SM, SL, SJ,
API	CF
ACEA	A3/B3-04, A3/B4-04, C3-04
BMW	LL04
Mercedes-Benz	229.31
Porsche	A40
Volkswagen	502.00 and 505.00

Havoline® Fully Synthetic C3 SAE 5W-30 3042

Synthetic Passenger Car Motor Oil

DESCRIPTION

Premium performance, multigrade motor oil formulated from selected synthetic base fluids and matching additive technology for use in passenger car and light truck gasoline and diesel engines under all operating conditions. It is a new generation product, formulated with reduced levels of metals and the elements phosphorus and sulfur to provide maximum durability of the latest low emission vehicle technologies and reduced emissions in all engines. It is optimised to provide complete engine protection plus ultimate performance.

Pack sizes: 205L, 20L.

APPLICATIONS

- Naturally aspirated and turbocharged gasoline and diesel engines in passenger cars.
- Light truck gasoline engines.
- Low emission passenger car and light duty vehicle engines fitted with latest catalytic converter (gasoline) or diesel particulate filter technology.
- Passenger car and light duty vehicles designed to meet Euro IV emission standards.
- Light vehicle gas-fuelled (Natural gas and CNG) spark ignition engines where the manufacturer recommends conventional passenger car motor oils.
- Four-stroke gasoline engines in portable power equipment where the manufacturer recommends conventional passenger car motor oils.

BENEFITS

Maximum engine life

Wider temperature capability of the synthetic base fluid ensures correct oil viscosity to reduce friction at start-up, and to provide maximum lubricity during high temperature operation. Anti-wear additives minimise wear in even the most sophisticated valve trains, including those with variable valve timing.

Reduced emissions

Formulated with latest generation technology containing reduced levels of metals, phosphorus and sulfur, it maximises the life of sensitive catalysts in catalytic converters and reduces the plugging rate of diesel particulate filters.

Maximum power and performance

Metallic detergent and ashless dispersant additives ensure maximum power and performance by controlling ring belt and piston skirt deposits, even under severe operating conditions. Special friction modifiers assist fuel economy.

Minimum maintenance costs

Thermal stability and oxidation resistance protect against in-service oil degradation which contributes to filter blocking and sludge formation in the oil galleries, crankcase and valve train. Low metal, phosphorus and sulfur formulation extends emission system durability.

Low oil consumption

Synthetic, highly shear-stable formulation improves control of oil flow through the ring belt area by maintaining oil viscosity, and reduces oil evaporation at the elevated ring zone temperatures experienced under all operating conditions.

PERFORMANCE STANDARDS

API	SM, SL, SJ,
API	CF
ACEA	A3/B3-04, A3/B4-04, C3-04
Mercedes-Benz	229.31

<p>Havoline® Synthetic Blend SAE 10W-40 3031</p> <p><i>Partial-Synthetic Passenger Car Motor Oil</i></p> <p>DESCRIPTION Multigrade motor oil formulated from a special blend of selected mineral oils, synthetic base fluids and matching additive technology for use in passenger car and light truck gasoline and diesel engines under all operating conditions. It is optimised to provide complete engine protection plus superior performance.</p> <p>Pack sizes: 205L, 20L, 5L, 1L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Naturally aspirated and turbocharged gasoline and diesel engines in passenger cars. • Light truck gasoline engines. • Light vehicle gas-fuelled (Natural gas and CNG) spark ignition engines where the manufacturer recommends conventional passenger car motor oils. • Four-stroke gasoline engines in portable power equipment where the manufacturer recommends conventional passenger car motor oils. 	<p>BENEFITS</p> <p>Prolongs engine life Wide temperature capability of the synthetic blend ensures correct oil viscosity to reduce friction at start-up, and to provide effective lubricity during high temperature operation. Anti-wear additives minimise wear in even the most sophisticated valve trains, including those with variable valve timing.</p> <p>Preserves full power and performance Metallic detergent and ashless dispersant additives preserve power and performance by controlling ring belt and piston skirt deposits, even under severe operating conditions. Special friction modifiers assist fuel economy.</p> <p>Reduces maintenance costs Thermal stability and oxidation resistance protect against in-service oil degradation which contributes to filter blocking and sludge formation in the oil galleries, crankcase and valve train.</p> <p>Lower oil consumption Highly shear-stable formulation and synthetic blend components provide control of oil flow through the ring belt area by maintaining oil viscosity, and reduce oil evaporation at elevated ring zone temperatures.</p> <p>PERFORMANCE STANDARDS</p> <table> <tr> <td>API</td> <td>SM, SL, SJ,</td> </tr> <tr> <td>API</td> <td>CF</td> </tr> <tr> <td>ACEA</td> <td>A3/B3-04</td> </tr> <tr> <td>Volkswagen</td> <td>505.00</td> </tr> </table>	API	SM, SL, SJ,	API	CF	ACEA	A3/B3-04	Volkswagen	505.00
API	SM, SL, SJ,								
API	CF								
ACEA	A3/B3-04								
Volkswagen	505.00								
<p>Havoline® Premium Plus SAE 10W-30 2967</p> <p><i>Fuel Efficient Passenger Car Motor Oil</i></p> <p>DESCRIPTION Multigrade gasoline engine oil for use in passenger car and light truck engines requiring API SM, SL, SJ or ILSAC GF-4 or GF-3 performance lubricants under all operating conditions. Provides good fuel economy properties and compatibility with latest generation exhaust emissions systems.</p> <p>Pack sizes: 205L, 20L, 5L, 1L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Naturally aspirated and turbocharged gasoline engines in passenger cars • Light truck gasoline engines. • Gas-fuelled (natural gas and LPG) spark ignition engines where conventional passenger car motor oils are recommended. • Four-stroke gasoline engines in portable power equipment where the manufacturer recommends conventional passenger car motor oils. <p>BENEFITS</p> <p>Saves on maintenance costs High thermal stability and oxidation resistance provides excellent protection against in-service oil degradation that contributes to filter blocking and sludge formation in the oil galleries, crankcase and valve train.</p>	<p>Longer engine life Proven metallo-organic anti-wear additive system protects engines under all operating conditions by providing excellent wear control in even the most sophisticated valve train mechanisms, including those with variable valve timing. Multigrade viscosity provides additional protection against wear at start-up and under high temperature operating conditions.</p> <p>Maintains high power and performance Metallic detergent and ashless dispersant additive system maintains high power and performance by providing excellent control of piston and ring deposits under high temperature conditions.</p> <p>Improved fuel economy Highly effective friction modifier and carefully chosen viscosity characteristics reduce internal engine friction while providing adequate oil film thickness under all operating temperatures.</p> <p>PERFORMANCE STANDARDS</p> <table> <tr> <td>API</td> <td>SM, SL, SJ, SH, SG, SF</td> </tr> <tr> <td>API</td> <td>CF</td> </tr> <tr> <td>API</td> <td>Energy Conserving</td> </tr> <tr> <td>ILSAC</td> <td>GF-4, GF-3</td> </tr> </table>	API	SM, SL, SJ, SH, SG, SF	API	CF	API	Energy Conserving	ILSAC	GF-4, GF-3
API	SM, SL, SJ, SH, SG, SF								
API	CF								
API	Energy Conserving								
ILSAC	GF-4, GF-3								
<p>Havoline® Extra SAE 15W-40 2887</p> <p><i>API SL/CF Motor Oil</i></p> <p>DESCRIPTION Highly shear-stable, multigrade gasoline engine oil formulated from selected base fluids for use in passenger car and light truck engines requiring API SL, SJ or SH performance lubricants under all operating conditions. It is optimised to provide complete engine protection against starting friction, heat stress and engine deposits.</p> <p>Pack size: 205L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Mixed fleets of both light duty diesel and gasoline engines. 	<p>BENEFITS</p> <p>Reduces maintenance costs Specially balanced metallic detergent and ashless dispersant additive system provides excellent overall engine cleanliness in all service conditions. Excellent oxidation stability protects against the formation of gums and varnish at elevated temperatures.</p> <p>Prolongs engine life Proven metallo-organic anti-wear additive system provides excellent protection against wear of critically loaded components under all operating conditions. Multigrade viscosity provides additional protection against wear at start-up and under high temperature operating conditions.</p> <p>Preserves full power and performance Metallic detergent and ashless dispersant additive system preserves full power and performance by providing excellent upper-ring-belt deposit control under the high temperatures encountered in modern engines.</p> <p>PERFORMANCE STANDARDS</p> <table> <tr> <td>API</td> <td>SL, SJ, SH</td> </tr> <tr> <td>API</td> <td>CF</td> </tr> </table>	API	SL, SJ, SH	API	CF				
API	SL, SJ, SH								
API	CF								

<p>Havoline® Premium SAE 20W-50 1320</p> <p><i>API SL/CF Passenger Car Motor Oil</i></p> <p>DESCRIPTION Highly shear-stable, multigrade gasoline engine oil formulated from selected base fluids for use in passenger car and light truck engines requiring API SL, SJ or SH performance lubricants under all operating conditions. It is optimised to provide complete engine protection against starting friction, heat stress and engine deposits.</p> <p>Pack sizes: 205L, 20L, 5L, 1L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Naturally aspirated and turbocharged gasoline engines in passenger cars. • Light truck gasoline engines. • Four-stroke gasoline engines in portable power equipment where the manufacturer recommends conventional passenger car motor oils. 	<p>BENEFITS</p> <p>Longer engine life Proven metallo-organic anti-wear additive system protects engines under all operating conditions by providing excellent wear control in even the most sophisticated valve train mechanisms, including those with variable valve timing. Multigrade viscosity provides additional protection against wear at start-up and under high temperature operating conditions.</p> <p>Maintains high power and performance Metallic detergent and ashless dispersant additive system maintains high power and performance by providing excellent control of piston and ring deposits under high temperature conditions.</p> <p>Saves on maintenance costs High thermal stability and oxidation resistance provides excellent protection against in-service oil degradation that contributes to filter blocking and sludge formation in the oil galleries, crankcase and valve train.</p> <p>Low oil consumption Highly shear-stable viscosity index improver controls oil flow through the piston rings by maintaining high-temperature oil viscosity within the ring belt area in all services.</p> <p>PERFORMANCE STANDARDS API SL, SJ, SH, SG, SF API CF</p>
<p>Havoline® Multigrade SAE 20W-50 1459</p> <p><i>API SG/CD Passenger Car Motor Oil</i></p> <p>DESCRIPTION High quality engine oil for use in a wide range of passenger car and light-duty commercial vehicle engines where API SG performance lubricants are required.</p> <p>Pack sizes: 205L, 20L, 4L, 1L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Naturally aspirated and turbocharged gasoline engines in passenger cars. • Light truck gasoline engines. • Four-stroke gasoline engines in portable power equipment where the manufacturer recommends conventional passenger car motor oils. 	<p>BENEFITS</p> <p>Long engine life Proven metallo-organic anti-wear additive system resists wear under all operating conditions by forming a protective layer on contact surfaces. Multigrade viscosity provides additional protection against wear at start-up and under high temperature operating conditions.</p> <p>Preserves power and performance Metallic detergent and ashless dispersant additive system preserves power and performance by providing good control of piston and ring deposits.</p> <p>Saves on maintenance Good thermal and oxidation stability resists in-service oil degradation that contributes to filter blocking and sludge formation.</p> <p>PERFORMANCE STANDARDS API SG, SF, SE API CD</p>
<p>Havoline® Classic SAE 25W-60 2946</p> <p><i>Higher Viscosity Passenger Car Motor Oil</i></p> <p>DESCRIPTION High quality engine oil for use in a wide range of older passenger car and light-duty commercial vehicle engines where API SG performance lubricants are required and SAE 25W-60 viscosity is preferred.</p> <p>Pack size: 5L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Naturally aspirated gasoline engines in passenger cars. • Light truck gasoline engines. 	<p>BENEFITS</p> <p>Long engine life Proven metallo-organic anti-wear additive system resists wear under all operating conditions by forming a protective layer on contact surfaces. Multigrade viscosity provides additional protection against wear at start-up and under high temperature operating conditions.</p> <p>Preserves power and performance Metallic detergent and ashless dispersant additive system preserves power and performance by providing good control of piston and ring deposits.</p> <p>Saves on maintenance Good thermal and oxidation stability resists in-service oil degradation that contributes to filter blocking and sludge formation.</p> <p>PERFORMANCE STANDARDS API SG, SF, SE API CD</p>

<p>Havoline® Ultra V SAE 5W-30 3029</p> <p><i>VW/Audi Passenger Car Motor Oil</i></p> <p>DESCRIPTION “Low-SAPS” multigrade motor oil formulated from selected base fluids and matching additive technology. Designed to meet the specific requirements of the VW/Audi group as defined in their VW 504.00/507.00 “Longlife III” specifications. As such it meets the requirements for use in all but a few models of VW/Audi passenger car and light duty commercial vehicles, both gasoline and diesel engines, under all operating conditions.</p> <p>Pack sizes: 200L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> Recent VW and Audi passenger car and light duty commercial vehicles for which VW 504.00 (gasoline) or 507.00 (diesel) approved lubricants are specified. VW and Audi vehicles designed for extended maintenance intervals (“Longlife Service QG1), including direct injection gasoline engines (FSI) and diesel engines with unit injectors and diesel particulate filters (DPFs). <p>Note: For R5 and V10 direct injected diesel engines, VW 506.01 approved oils are recommended.</p>	<p>BENEFITS</p> <p>Maximum life of diesel particulate filters Low-SAPS (low sulfated ash, phosphorus and sulfur) design increases the durability of diesel particulate filters and their associated catalyst materials. Additionally, minimising filter blockage helps to maintain vehicle power and performance during the life of the DPF.</p> <p>Reduced emissions Reduced levels of metals, phosphorus and sulfur, maximises the life of catalysts and reduces the plugging rate of diesel particulate filters.</p> <p>Maximum power and performance Metallic detergent and ashless dispersant additives ensures maximum power and performance by controlling ring belt and piston skirt deposits, even under the most severe operating conditions.</p> <p>Low oil consumption Highly shear-stable formulation controls oil flow through the ring belt area by maintaining oil viscosity, and reduces oil evaporation at the elevated ring zone temperatures experienced under all operating conditions.</p> <p>PERFORMANCE STANDARDS Volkswagen 504.00 and 507.00 approved</p>
<p>Havoline® LPG SAE 20W-50 2869</p> <p><i>Gas Fuelled Passenger Car Motor Oil</i></p> <p>DESCRIPTION Shear-stable, multigrade engine oil formulated from selected base fluids for use in gas, dual fuel or petrol passenger car and light truck engines requiring API SL, SJ or SH performance lubricants under all operating conditions</p> <p>Pack sizes: 5L, 1L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> Gas-fuelled (LPG and natural gas) spark ignition engines where conventional passenger car motor oils are recommended. Dual-fuelled (gasoline and LPG or natural gas) spark ignition engines where conventional passenger car motor oils are recommended. Mixed fleets containing light duty gas, dual-fuel and gasoline engines. <p>BENEFITS</p> <p>Longer engine life Proven metallo-organic anti-wear additive system protects engines under all operating conditions by providing excellent wear control in even the most sophisticated valve train mechanisms, including those with variable valve timing. Multigrade viscosity provides additional protection against wear at start-up and under high temperature operating conditions.</p>	<p>Maintains high power and performance Metallic detergent and ashless dispersant additive system maintains power and performance by providing excellent control of piston and ring deposits under high temperature conditions.</p> <p>Saves on maintenance costs Thermal stability and oxidation resistance provides excellent protection against in-service oil degradation that contributes to filter blocking and sludge formation in the oil galleries, crankcase and valve train.</p> <p>Low oil consumption Shear-stable viscosity index improver controls oil flow through the piston rings by maintaining high-temperature oil viscosity within the ring belt area in all services.</p> <p>PERFORMANCE STANDARDS API SL, SJ, SH, SG, SF API CF</p> <p>SERVICE CONSIDERATIONS CNG- and LPG-fuelled spark ignition passenger car and light commercial vehicle engines vary in their lubricant requirements. Typically the requirement is for engine oils that meet all of the requirements for the corresponding gasoline-fuelled engines, and in addition have properties that make them suitable for use under gas-fuelled conditions, which in some respects are more severe. It is also customary to use lower viscosity grades in gas-fuelled service. For such applications Havoline Premium Plus SAE 10W-30 is recommended. On the other hand, there are some gas-fuelled engines whose builders have determined that conventional passenger car motor oils, with no special or enhanced properties in respect of gas-fuelling conditions, are suitable, and for which extra high viscosity grades, including SAE 20W-50, are appropriate. Havoline LPG SAE 20W-50 is intended for use in such engines.</p>

Typical Characteristics

Product	SAE Grade	CODE	API	ACEA	Density @ 15 °C kg/L	Pour Point °C	Flash Point °C *	Viscosity cSt @		VI	BN mgKOH/g D2896	Sulfated Ash %m
								40 °C	100 °C			
Havoline Classic	25W-60	2946	SG/CD	-	0.90	-21	≥220	276	25.0	115	5.3	0.72
Havoline Extra	15W-40	2887	SL/CF	-	0.89	-27	≥215	117	15.1	137	7.1	0.93
Havoline Fully Synthetic	5W-40	3032	SM/CF	C3-04	0.86	-30	205	90	14.5	168	7.9	0.8
Havoline Fully Synthetic C3	5W-30	3042	SM/CF	C3-04	0.852	-36	200	72	12.2	167	7.9	0.8
Havoline LPG	20W-50	2869	SL/CF	-	0.889	-24	≥215	172	19.5	130	7.1	0.93
Havoline Multigrade	20W-50	1459	SG/CD	-	0.89	-24	≥215	167	19.2	130	5.3	0.71
Havoline Premium	20W-50	1320	SL/CF	-	0.889	-24	≥215	172	19.5	130	7.1	0.93
Havoline Premium Plus	10W-30	2967	SM/GF-4	-	0.89	-27	200	77	11.1	133	7.6	0.88
Havoline Synthetic Blend	10W-40	3031	SM/CF	A3/B3	0.865	-30	205	99.5	14.5	151	8.0	1.1
Havoline Ultra V	5W-30	3029	VW 504.00 VW 507.00		0.848	-42	230	71	11.5	155	5.8	0.60

* Cleveland Open Cup Flashpoint

Havoline® Super 2T

3050

Two-Stroke Motorcycle Oil

DESCRIPTION

Two-stroke motorcycle oil that protects vital engine parts. It is formulated with a special low ash additive system and designed for engines requiring JASO FC or ISO EGC performance lubricants, including high output machines operating in severe service Dyed Green.

Pack sizes: 20L, 4L, 1L.

APPLICATIONS

- Air and liquid-cooled two-stroke motorcycle engines.
- Particularly suitable for Japanese high performance motorcycle engines
- Latest generation, two-stroke scooter engines.
- Japanese two-stroke engines fitted to portable power equipment (other than chainsaws).
- Oil-injected engines (except marine outboard) where no fuel/oil premixing is required.
- Air-cooled, oil-gasoline premix engines at manufacturer's recommended gasoline-to-oil ratios up to 50:1.
- Two-stroke motorcycle, motor tricycle and quad-bike engines fitted with exhaust catalyts.

Not recommended for use in marine outboard engines, chainsaw engines or any CNG- or LPG-fuelled two-stroke engines.

BENEFITS

Powerful throttle response

Power and good acceleration are maintained by providing excellent cleanliness of pistons and exhaust ports, through the reduction of ash and carbon deposits.

Reduces exhaust smoke

Superior combustion characteristics reduce smoke in exhaust emissions, which also provides improved working environment for operators of portable power equipment.

Extends engine life

Semi-synthetic base fluids provide superior lubricity to reduce wear of pistons and cylinders.

Maximizes spark plug life

Low ash additive system reduces ash build-up on spark plugs under all operating conditions.

Dyed green for ease of identification.

PERFORMANCE STANDARDS

API	TC
JASO	FC (Identification Number: 061CTC683)
ISO	EGC
SAE Grade (J1536)	F/M 2

Two-Stroke Blending Table

Oil/Fuel ratio	5 Litres Petrol	10 Litres Petrol	20 Litres Petrol
25/1	200ml oil	400 ml oil	800 ml oil
50/1	100 ml oil	200 ml oil	400 ml oil
100/1	50 ml oil	100 ml oil	200 ml oil

Typical Characteristics

Product	SAE Grade	CODE	API	ACEA	Density @ 15 °C kg/L	Pour Point °C	Flash Point °C	Viscosity cSt @		VI	BN mgKOH/g D2896	Sulfated Ash %m
								40 °C	100 °C			
Havoline Super 2T	F/M 2	3050	TC	-	0.878	-30	91	64.2	9.8	136	0.13	0.12

Delo® XLD Multigrade SAE 10W-40 2691

Extra High Performance Synthetic Diesel Engine Oil

DESCRIPTION

Fully synthetic, Extra High Performance Diesel (XHPD) engine oil designed to meet the most severe performance requirements of high output, European low emission Euro 2 and Euro 3 type diesel engines. Formulated from selected synthetic base fluids and specialised additives to provide the maximum oil drain intervals recommended for Euro 2 and Euro 3 compliant engines.

Pack sizes: 205L.

APPLICATIONS

- Naturally aspirated & turbocharged high speed, four-stroke European diesel engines, including low emission Euro 2 and Euro 3 type engines.
- All automotive diesel engines requiring XHPD or SHPD oils.
- Naturally aspirated & turbocharged high speed Japanese diesel engines.
- Commercial road transport in light, medium and heavy-duty service.
- Off-highway vehicles.

BENEFITS

Reduced maintenance costs

Detergent additive minimises piston crown land deposits which can lead to damaging bore polishing.

Maximises engine life

Metallo-organic anti-wear additives reduce wear in severe service by forming a protective layer on all metal contact surfaces. Wide-range SAE 10W-40 multigrade viscosity provides reduced friction at start-up and maximum lubricity at high operating temperatures.

Ultra long oil drain intervals

High temperature stability minimises degradation that leads to sludge formation and oil thickening, and provides oil service intervals up to the maximum levels recommended for Euro 2 and Euro 3 type engines.

Low oil consumption

Shear-stable viscosity index improvers reduce oil flow past the piston rings by maintaining oil viscosity in the high temperature ring belt area, while low volatility base fluids minimise evaporative oil loss.

Maximum power output

Detergent/dispersant additive system maintains power output by controlling deposits under the high temperature conditions encountered in turbocharged engines.

PERFORMANCE STANDARDS

ACEA	E4-99, E3-96
API	CF, CD
MAN	M 3277
Mercedes Benz	228.5
MTU	Type 3
Renault	RXD
Scania	LDF
Volvo	VDS-2, VDS
Meets the requirements of:	
DAF	100,000 km drain specification
Mack	T9 Test (EOM-Plus level)

NOTE: A version of Delo XLD which is approved against Scania LDF-2 is available under product code 3058

Delo® 400 LE SAE 15W-40 3006

Low SAPS Diesel Engine Oil

DESCRIPTION

Latest generation API CJ-4 engine oil formulated for new low emission North American engines fitted with diesel particulate filters. Also suitable for earlier generation engines. Fully compatible with previous API Categories. It uses the most advanced additive technology available to provide outstanding engine protection for 2007 EPA exhaust particulate emissions standards for on highway diesel trucks. It is formulated with ISOSYN™ base stocks, which rival synthetics in critical engine tests, and an optimal blend of the latest technology in dispersant, detergent, oxidation inhibition, anti-wear, corrosion inhibition, viscosity improver, and defoaming additives. Delo 400 LE meets the most stringent EGR soot control and particulate requirements. Delo 400 LE is designed to meet the demands of EGR engines while at the same time providing the highest level of performance in conventional engines and other engine technologies like Caterpillar ACERT™.

Pack size: 205L, 20L.

APPLICATIONS

- All naturally aspirated and turbocharged 4-stroke diesel and gasoline engines in which API CJ-4/SM SAE 15W-40 lubricants are recommended.
- New advanced heavy duty diesel engines developed in response to 2007 emissions standards and in heavy duty diesel engines equipped with features like four-valve heads, supercharging, turbo charging, direct injection, higher power density, intercooling, full electronic management of fuel and emissions systems, exhaust gas recirculation, and exhaust particulate traps.
- Older engines, as well as in today's most modern low emission designs.
- Caterpillar engines in off-highway or construction applications which require an API CJ-4 Service Category after January 1, 2007.

BENEFITS

Reduced operating costs

Exceptional soot dispersancy and wear control. Cylinders, pistons, rings, and injectors are well protected against wear and corrosion, lasting longer in service and requiring less maintenance. Contributes to maximum vehicle utilization and minimal downtime.

Enhanced emission control system life

Extends Diesel Particulate Filter (DPF) life for less frequent downtime and cleaning. Optimises the exhaust gas recirculation system life decreasing maintenance costs.

Reduced inventory costs

Backwards compatible with all previous API Oil Service Categories and engine models. One oil for all services, in four-stroke gasoline and all naturally aspirated turbocharged and modern electronically controlled/low emission diesel engines. One oil that meets the engine performance requirements of North American and European engine manufacturers. One oil that allows users with a wide mix of engine brands to enjoy simplified inventory and dispensing systems that help save money, space, handling time, and avoid product misapplication.

PERFORMANCE STANDARDS

ACEA	E-7
API	CJ-4, CI-4 PLUS, CI-4, CH-4, CF
API	SM, SL
Caterpillar	ECF-3, ECF-2
Cummins	CES 20081
DDC	93K218
Mack	EO-O Premium Plus 07
MAN	3275
Mercedes Benz	228.31
Renault	RLD-3
Volvo	VDS-4

Delo® 400 Multigrade SAE 15W-40

2696

“Universal Diesel Engine Oil”

DESCRIPTION

Premium performance, multigrade, heavy-duty diesel engine oil specifically designed to lubricate a wide range of diesel and gasoline engines requiring API CI-4 PLUS, CI-4, SL, ACEA E7 or JASO DH-1 performance lubricants operating under the most severe service conditions. Specifically designed for the latest electronically controlled diesel engines, including those fitted with EGR and/or SCR systems, experiencing high soot loading. Formulated with ISOSYN™ base oils and the latest additive technology to provide exceptional soot dispersancy, deposit control and wear protection.

Pack sizes: 205L, 20L, 5L, 1L

APPLICATIONS

- Mixed fleets of European, North American and/or Japanese diesel engines (high speed, four-stroke, turbocharged or naturally aspirated).
- Mixed fleets of both diesel and gasoline engines.
- Mixed fleets including both old and new equipment.
- Commercial road transport, including the latest electronic controlled engines and those designed to meet Euro 3 emissions standards. Also for Euro 4 compliant vehicles, except those units fitted with diesel particulate filters and requiring ACEA E6 oils.
- Stop-and-go vehicles in high soot loading service such as buses and waste collection trucks.
- Off-highway vehicles and plant.
- Agricultural tractors and farm machinery.
- Generator sets.
- Mobile hydraulic systems (where oil type and viscosity are appropriate).

BENEFITS

Minimises fleet maintenance costs

Exceptional soot dispersancy keeps fuel soot in suspension, avoiding filter plugging, cylinder head sludge, abrasive polishing wear and oil thickening.

Minimises fleet operating costs

Excellent deposit control on valves and piston crownlands reduces oil consumption. Exceptional oxidation stability and soot control extends oil drain capability so that equipment is in service longer generating revenue. Outstanding valve train wear protection maintains fuel economy.

Extends engine life to overhaul

High level of anti-wear additive protects against valve train wear and scuffing of highly loaded parts operating under boundary lubrication conditions.

Reduces inventory costs

“Universal” formulation provides excellent overall performance in mixed fleets of different engine designs, (including modern electronically controlled/low emission diesel engines) allowing one oil for all services and reducing the chance of problems arising through product misapplication.

PERFORMANCE STANDARDS

ACEA	E7-04, E5-02, E3-96.
API	CI-4 PLUS, CI-4, CH-4, CG-4, CF-4, CF, CD
API	SL, SJ, SH
Caterpillar	ECF-2, ECF-1a
Cummins	CES 20078, 20077, 20076, 20072
DDC	93K214
EMA	Global DHD-1
JASO	DH-1
Mack	EO-N Premium Plus 03, EO-M Plus, EO-M, EO-L Plus
MAN	M 3275, 271 MTU and DDC Categories 1&2
Mercedes Benz	228.3
Volvo	VDS-3, VDS-2
ZF	TE-ML 04C, 07C

Delo® Gold Plus Multigrade

3052

Multifunctional Diesel & Gasoline Engine Oil

DESCRIPTION

High performance, multigrade, heavy-duty diesel engine oil specifically designed to lubricate a wide range of diesel and gasoline engines requiring API CI-4, CF or SL performance lubricants.

Pack Size: 205L.

APPLICATIONS

- Mixed fleets of diesel engines (high speed, four-stroke, turbocharged or naturally aspirated)
 - Mixed fleets of both diesel and gasoline engines
 - Commercial road transport
 - Off-highway vehicles and plant
 - Agricultural tractors and farm machinery
 - High speed diesel engines in marine service (e.g., fishing, river transport)
 - Generator sets
 - Mobile hydraulic systems (where oil type and viscosity are appropriate)
- Not recommended for use in two cycle diesel or two cycle petrol engines.

BENEFITS

Reduces fleet maintenance costs

Specially balanced metallic detergent and ashless dispersant additive system provides excellent overall engine cleanliness in all service conditions, particularly the higher soot dispersancy required to maintain oil drain intervals in modern engine designs.

Prolongs engine life

Proven metallo-organic anti-wear additive system provides excellent protection against wear of critically loaded components under all operating conditions. Provides the combination of high oxidation stability, dispersancy and reserve alkalinity required to protect engines operating with high levels of cooled exhaust gas recirculation (EGR). Multigrade viscosity provides additional protection against wear at start-up and under high temperature operating conditions

Preserves full power and performance

Metallic detergent and ashless dispersant additive system preserves full power and performance by providing excellent upper-ring-belt deposit control under the high temperatures encountered in turbocharged diesel engines

Saves on inventory costs

Mid-ash, higher dispersancy formulation provides excellent overall performance in mixed fleets of different engine designs, allowing fewer oils to be stored and reducing the chance of problems arising through product misapplication.

PERFORMANCE STANDARDS

ACEA	E7-04, E5-02, E3-96
API	CI-4, CH-4, CG-4, CF-4, CF, CD
API	SL
Global	DHD-1
MTU	Type 2 (Pending)
Recommended for applications where any of the following are called for	
Caterpillar	ECF-1a
Cummins	CES 20078, 20072
DDC	7SE-270
Mack	EO-M Plus
MAN	M3275, 271
Mercedes Benz	228.3
Volvo	VDS-2

<p>Delo® Gold Multigrade 2894</p> <p><i>Multifunctional Diesel & Gasoline Engine Oil</i></p> <p>DESCRIPTION High performance, multigrade, heavy-duty diesel engine oil designed to lubricate a wide range of diesel and gasoline engines requiring API CH-4, CF or SL performance lubricants.</p> <p>Pack sizes: 205L, 20L,10L,5L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Mixed fleets of diesel engines (high speed, four-stroke, turbocharged or naturally aspirated) . • Mixed fleets of both diesel and gasoline engines. • Commercial road transport. • Off-highway vehicles and plant. • Agricultural tractors and farm machinery. • High speed diesel engines in marine service (e.g., fishing, river transport) • Generator sets. • Mobile hydraulic systems (where oil type and viscosity are appropriate). <p>BENEFITS Reduces fleet maintenance costs Detergent and dispersant additives provide overall engine cleanliness in all service conditions, particularly the higher soot dispersancy required to maintain oil drain intervals in modern engine designs. Oxidation stability protects against formation of gums and varnish at elevated temperatures</p>	<p>Prolongs engine life Metallo-organic anti-wear additive system provides protection against wear of critically loaded components under all operating conditions. Multigrade viscosity provides additional protection against wear at start-up and under high temperature operating conditions.</p> <p>Preserves full power and performance Metallic detergent and ashless dispersant additive system preserves power and performance by providing excellent upper-ring-belt deposit control under the high temperatures encountered in turbocharged diesel engines.</p> <p>Saves on inventory costs Provides excellent overall performance in mixed fleets, allowing fewer oils to be stored and reducing the chance of misapplication.</p> <p>PERFORMANCE STANDARDS</p> <table> <tr><td>ACEA</td><td>E3-96</td></tr> <tr><td>API</td><td>CH-4, CG-4, CF-4, CF, CD</td></tr> <tr><td>API</td><td>SL</td></tr> <tr><td>Caterpillar</td><td>ECF-1</td></tr> <tr><td>Cummins</td><td>CES 20072, 20071</td></tr> <tr><td>JASO</td><td>DH-1 Engine Tests</td></tr> <tr><td>Mack</td><td>EO-M, EO-L</td></tr> <tr><td>MAN</td><td>271</td></tr> <tr><td>Mercedes-Benz</td><td>228.3</td></tr> <tr><td>Volvo</td><td>VDS-2</td></tr> </table>	ACEA	E3-96	API	CH-4, CG-4, CF-4, CF, CD	API	SL	Caterpillar	ECF-1	Cummins	CES 20072, 20071	JASO	DH-1 Engine Tests	Mack	EO-M, EO-L	MAN	271	Mercedes-Benz	228.3	Volvo	VDS-2
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<p>Delo® Silver Multigrade SAE 15W-40 2895</p> <p><i>Multifunctional Diesel & Gasoline Engine Oil</i></p> <p>DESCRIPTION Multigrade, heavy-duty diesel engine oil for lubrication of pre-1999 US, and a wide variety of European and Japanese, diesel four stroke engines requiring API CG-4, CF, or MB 228.1 performance lubricants.</p> <p>Pack sizes: 205L, 20L, 5L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Pre-1999 US emission design, four stroke diesel engines. • Wide range of Japanese and European diesel engines. • Long distance trucking, earth moving, off-highway, marine, agricultural and stationary plant operations. • Many current model four stroke petrol engines. • Rationalisation for fleets including heavy and light duty diesel and petrol engines. • Transmissions and hydraulic systems (where oil type and viscosity are appropriate). <p>BENEFITS Saves on fleet maintenance costs Metallic detergent and ashless dispersant additives provide high temperature deposit control in diesel engines and low temperature sludge control in gasoline engines. Oxidation stability inhibits formation of gums and varnish at elevated temperatures, and resists thickening, and oil line and filter plugging.</p>	<p>Longer engine life Metallo-organic anti-wear additive system protects against wear of critically loaded components. Multigrade viscosity provides additional protection against wear at start-up and under high temperature operating conditions.</p> <p>Maintains high power and performance Metallic detergent and ashless dispersant additive maintains power and performance by providing upper-ring-belt deposit control, particularly under high temperatures encountered in turbocharged diesel engines.</p> <p>Low inventory costs Provides good overall performance in mixed fleets allowing fewer oils to be stored and reducing the chance of misapplication.</p> <p>PERFORMANCE STANDARDS</p> <table> <tr><td>ACEA</td><td>E2</td></tr> <tr><td>API</td><td>CG-4, CF, SJ</td></tr> <tr><td>Japanese</td><td>CD</td></tr> <tr><td>US Military</td><td>MIL-L-2104F, MIL-L-46512E</td></tr> <tr><td>MB</td><td>228.1 227.1</td></tr> <tr><td>Man</td><td>271</td></tr> <tr><td>Mack</td><td>EO-L</td></tr> <tr><td>Volvo</td><td>VDS</td></tr> <tr><td>ZF</td><td>TE-ML 03A, 07D</td></tr> </table>	ACEA	E2	API	CG-4, CF, SJ	Japanese	CD	US Military	MIL-L-2104F, MIL-L-46512E	MB	228.1 227.1	Man	271	Mack	EO-L	Volvo	VDS	ZF	TE-ML 03A, 07D		
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<p>Delo® Silver SAE 10W, 30, 40 2896, 2897, 2898</p> <p><i>Multifunctional Diesel & Gasoline Engine Oil</i></p> <p>DESCRIPTION Monograde, high performance diesel engine oils designed for a wide range of older diesel and petrol engines where a monograde is preferred.</p> <p>Pack sizes: 205L, 20L. SAE 30 is also available in 5L packs.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Marine, off-highway, agricultural and stationary plant operations. • Hydraulics and transmissions, where appropriate • The SAE 10W grade is available for non-engine applications. • The SAE 30 grade can be used in garden appliance petrol engines such as Briggs and Stratton. 	<p>BENEFITS Saves on maintenance Metallo-organic anti-wear additive system resists wear by forming a protective layer on contact surfaces under all service conditions.</p> <p>Prolongs periods between overhauls Metallic detergent and ashless dispersant additive system resists the formation of high temperature deposits in diesel engines and low temperature sludge in gasoline engines. Good oxidation stability resists oil degradation and protects against oil thickening, and oil line and filter plugging.</p> <p>Preserves power and performance Metallic detergent and ashless dispersant additive systems preserve power and performance by providing control of high-temperature piston and ring deposits.</p> <p>PERFORMANCE STANDARDS</p> <table> <tr><td>API</td><td>CF</td></tr> <tr><td>API</td><td>SJ</td></tr> <tr><td>Japanese</td><td>CD</td></tr> </table>	API	CF	API	SJ	Japanese	CD														
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<p>Delo® HDD SAE 40, 50 1796, 1797</p> <p><i>Multifunctional Diesel Engine Oil</i></p> <p>DESCRIPTION High performance, monograde, low ash diesel engine oil specifically designed to lubricate Detroit Diesel Corporation (DDC) two-cycle diesel engines where API CF-2 performance lubricants are required.</p> <p>Pack sizes: 205L, 20L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • DDC two-cycle diesel engine applications, Series 53, 71, 92 and 149 (except Series 149 engines in mine haul applications). • Pre-1994 model high-speed, four-stroke North American diesel engines (where use of monograde oil is appropriate). • Commercial road transport. • Quarrying and mining. • Earthmoving and construction equipment. • Agricultural tractors. • Small diesel engines in marine service (e.g., fishing, river transport, etc.). • Manual transmissions (where oil type and viscosity are appropriate). • Mobile hydraulic systems (where oil type and viscosity are appropriate). 	<p>BENEFITS</p> <p>Maximum engine & exhaust valve life Low ash formulation minimises ash-induced piston and exhaust valve deposits in two-cycle diesel engines. Advanced metallic detergent and dispersant additive system provides control of carbonaceous deposits under the high operating temperature conditions of supercharged or turbocharged diesel engines.</p> <p>Trouble-free operation Oxidation stability protects against the formation of gums and varnish at elevated temperatures, resists thickening, and oil line and filter plugging.</p> <p>Maximum power output Detergent/dispersant additive system maintains power output by providing control of piston ring and groove deposits that can affect engine operation.</p> <p>PERFORMANCE STANDARDS</p> <table> <tr> <td>API</td> <td>CF-2 licensed, CD-II and CD</td> </tr> <tr> <td>DDC</td> <td>7SE-270, 9706 (Caltex Delo HDD has a specific DDC exemption for Base Number based on proven engine test and field performance record) (SAE 40)</td> </tr> <tr> <td>Mack</td> <td>EO-K/2 (SAE 40), Extended Mack T-7 test (SAE 40)</td> </tr> <tr> <td>US Military</td> <td>MIL-L-2104F (SAE 40)</td> </tr> </table>	API	CF-2 licensed, CD-II and CD	DDC	7SE-270, 9706 (Caltex Delo HDD has a specific DDC exemption for Base Number based on proven engine test and field performance record) (SAE 40)	Mack	EO-K/2 (SAE 40), Extended Mack T-7 test (SAE 40)	US Military	MIL-L-2104F (SAE 40)														
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<p>Super Tractor SAE 15W-40 2710</p> <p><i>Universal Tractor Fluid</i></p> <p>DESCRIPTION Shear stable, multigrade super tractor oil universal (STOU) fluid for tractor crankcases, transmissions including wet brakes, final drives and hydraulic systems where API CF, SF and API GL-4 fluids are recommended.</p> <p>Pack sizes: 205L, 20L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Where tractor manufacturers specify an STOU type product. • Mixed fleets of agricultural tractors and associated equipment. • Mobile or stationary diesel engines (except two stroke). • Older style gasoline engines. • Automotive manual transmission gearboxes. • Tractor hydraulics. • Enclosed oil immersed (wet) brakes. • Power take off (PTO) clutches. <p>BENEFITS</p> <p>Minimises application problems Unique multi-application additive package enables use in engines, transmissions, final drives and hydraulic systems, avoiding costly equipment failure due to misapplication.</p> <p>Reduced maintenance costs Outstanding oxidation and nitration resistance minimises acid number increase, providing protection against bearing corrosion.</p>	<p>Extended oil change periods Very high oxidation stability protects against the formation of gums and varnishes, reduces oil thickening and increases oil life.</p> <p>Maintains power output Detergent/dispersant additive system maintains power output by providing deposit control under the high temperature conditions encountered in both naturally aspirated and turbocharged diesel vehicles. Multi-viscosity characteristics ensure rapid oil circulation on start-up, preventing wear which contributes to power loss.</p> <p>Smooth and quiet operation Special friction modifier component allows smooth action of the wet brakes and power take-off clutches, minimising chatter, stick slip and squawk.</p> <p>PERFORMANCE STANDARDS</p> <table> <tr> <td>API</td> <td>CF-4, SF</td> </tr> <tr> <td>API</td> <td>GL-4</td> </tr> <tr> <td>US Military</td> <td>MIL-L-2104D, MIL-L-46152B</td> </tr> <tr> <td>John Deere</td> <td>JDM J27</td> </tr> <tr> <td>Ford</td> <td>ESN-M2C-159-B</td> </tr> <tr> <td>Massey Ferguson</td> <td>CMS M1144, M1145</td> </tr> <tr> <td>ZF</td> <td>TE-ML 06B, 07B</td> </tr> </table> <p>Meets the performance requirements of:</p> <table> <tr> <td>Caterpillar</td> <td>TO-2 (obsolete)</td> </tr> <tr> <td>John Deere</td> <td>JDM J20C</td> </tr> <tr> <td>Ford</td> <td>ESN-M2C134-D</td> </tr> <tr> <td>Massey Ferguson</td> <td>CMS M1135, M1139</td> </tr> </table>	API	CF-4, SF	API	GL-4	US Military	MIL-L-2104D, MIL-L-46152B	John Deere	JDM J27	Ford	ESN-M2C-159-B	Massey Ferguson	CMS M1144, M1145	ZF	TE-ML 06B, 07B	Caterpillar	TO-2 (obsolete)	John Deere	JDM J20C	Ford	ESN-M2C134-D	Massey Ferguson	CMS M1135, M1139
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<p>RPM Gas Engine Oil SAE 15W-40 3046</p> <p><i>Multigrade Gas Engine Oil</i></p> <p>DESCRIPTION A heavy duty multigrade gas engine oil for use in engines running on compressed natural gas (CNG), liquefied natural gas (LNG), and liquefied petroleum gas (LPG).</p> <p>Pack size: 205L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Medium and heavy duty vehicles powered by natural gas and propane-fuelled engines where engine manufacturers recommend a low ash lubricant with improved valve train wear performance. • Cummins B5.9G and C8.3G alternative fuel engines. • Detroit Diesel Series 50G, 60G alternative fuel engines. 	<p>BENEFITS</p> <p>Low wear Protection against piston, ring, and liner scuffing, scoring, and wear, including wear protection for slider follower valve trains in alternative fuel engines.</p> <p>Clean crankcases and top decks Oxidation and nitration resistance reduces the build-up of insolubles and provides extended oil and filter life. This minimises the formation of sludge in the crankcase and in the valve rocker cover/top deck area.</p> <p>Reduced valve recession The level and type of ash producing additives in this oil provides minimum valve recession with low levels of combustion chamber deposits to minimise the potential for pre-ignition and spark plug fouling.</p> <p>Piston and ring belt deposit control An optimised blend of detergents, dispersants, and inhibitors provides deposit control throughout the entire engine.</p> <p>PERFORMANCE STANDARDS</p> <table> <tr> <td>Cummins</td> <td>CES 20074 (B5.9G and C8.3G only)</td> </tr> <tr> <td>Detroit Diesel</td> <td>7SE272-9510 (Series 50G and 60G only)</td> </tr> </table>	Cummins	CES 20074 (B5.9G and C8.3G only)	Detroit Diesel	7SE272-9510 (Series 50G and 60G only)																		
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Typical Characteristics

AUTOMOTIVE ENGINE OILS Heavy Duty

Product	SAE Grade	CODE	API	ACEA	Density @ 15 °C kg/L	Pour Point °C	Flash Point °C *	Viscosity cSt @		VI	BN mgKOH/g D2896	Sulfated Ash %m
								40 °C	100 °C			
Delo 400 LE	15W-40	3006	CJ-4	E7-04	0.886	-30	204	125	15.7	131	9.6	1.0
Delo 400 Multigrade	15W-40	2696	CI-4+	E7-04	0.886	-33	230	125	15.1	125	12.2	1.4
Delo Gold Plus	15W-40	3052	CI-4	E7	0.89	< -24	>215	113	15.1	139	10.1	1.4
Delo Gold Multigrade	15W-40	2894	CH-4	E3-96	0.889	-27	220	115	15.1	137	9.5	1.3
Delo HDD 40	40	1796	CF-2	-	0.903	-18	230	142	14.4	99	6.0	0.8
Delo HDD 50	50	1797	CF-2	-	0.900	-12	240	219	19.1	98	6.0	0.8
Delo Silver 10W	10W	2896	-	-	0.886	-33	210	41.9	6.5	105	10.2	1.4
Delo Silver 30	30	2897	CF	-	0.904	-21	225	102	11.5	98	10.2	1.4
Delo Silver 40	40	2898	CF	-	0.909	-18	230	142	14.4	97	10.2	1.4
Delo Silver Multigrade	15W-40	2895	CG-4	E2	0.889	-27	220	115	15.1	137	10.2	1.4
Delo XLD Multigrade	10W-40	2691	CF	E4-99	0.896	-27	220	90	13.8	155	14.1	1.8
RPM Gas Engine Oil	15W-40	3046	-	-	0.876	-36	230	115	15	136	5.1	0.55
Super Tractor SAE 15W-40	15W-40	2710	CF-4	-	0.889	-33	220	113	15.1	139	10.1	1.4

* Cleveland Open Cup Flashpoint

Synthetic Automatic Transmission Fluid Heavy Duty 2915

Automotive Synthetic Transmission Fluid

DESCRIPTION

Multipurpose anti-wear automatic transmission fluid (ATF) formulated in ultra high viscosity index synthetic base fluid, with Allison Transmission and Voith Turbo approvals. Specially designed for heavy duty automatic truck and bus transmissions operating in severe service.

Pack sizes: 205L, 20L.

APPLICATIONS

- Car and light truck automatic transmissions.
- Power steering units where the manufacturer recommends a DEXRON® or MERCON® fluid.
- Heavy-duty automatic transmissions on and off-highway.
- Rotary vane and screw type air compressors (where this type of fluid is appropriate).
- Mobile hydraulic systems.
- Industrial anti-wear hydraulic systems.
- Marine anti-wear hydraulic systems.
- Manual transmissions and transaxles where this type of fluid is appropriate.

BENEFITS

Minimises inventory

Effective EP additive, viscosity characteristics and a wide range of manufacturers' approvals allows use in a variety of automotive, industrial and marine applications, reducing risk of misapplication.

Extended oil life

Synthetic base fluid and inhibitor package provide outstanding oxidation resistance and thermal stability which prevents acid build-up, oil thickening and deposit formation and can extend oil drain interval up to four times that of conventional ATF.

Maximises transmission life

Highly stable viscosity index improver resists break down under high shear conditions found in modern transmissions, maintaining oil viscosity and film thickness to protect moving components. Superior antiwear properties and resistance to sludge formation extend the time to transmission overhaul in severe service conditions.

Smooth operation

Combination of synthetic base fluid, special viscosity index improver and advanced friction modifiers provides excellent lubricating qualities at high and low temperatures and smooth shifting and efficient power transfer under all service conditions.

PERFORMANCE STANDARDS

Approvals

Allison	TES-389 (AA-31992007) , C4 fluid (C4-31662005)
Ford	MERCON® V (M5050801)
Voith	Turbo H55.6335 (G607 List)
Voith	Turbo H55.6336 (Extended Drain approved)
MAN	339 Type V1 and Z2
ZF TE-ML	14B

Suitable for use where the following fluid specifications are recommended:

Allison	TES-295
GM	DEXRON®-III (obsolete)
Ford	MERCON® (obsolete)

Texamatic® 1888 2940

Automatic Transmission & Power Steering Fluid

DESCRIPTION

High performance, multipurpose, shear stable, anti-wear automatic transmission fluid (ATF) with Allison Transmission and Voith Turbo approvals. Formulated with high performance hydrocracked base oils and the latest additive technology to provide exceptional oxidation resistance, extended oil life and outstanding wear protection. Dyed red.

Pack sizes: 205L, 60L, 20L, 4L, 1L.

APPLICATIONS

- Car and light truck automatic transmissions.
- On-highway heavy-duty automatic transmissions.
- Off-highway heavy-duty automatic transmissions.
- Power steering units (where the manufacturer recommends a DEXRON® or MERCON® fluid).
- Rotary vane and screw type air compressors (where this type of fluid is appropriate).
- Mobile hydraulic systems.
- Industrial anti-wear hydraulic systems.
- Marine anti-wear hydraulic systems.
- Manual transmissions and transaxles (where this type of fluid is appropriate).

BENEFITS

Smooth operation

Combination of advanced friction modifiers, base oil viscosity and shear stable viscosity index improvers provides optimum frictional characteristics, ensuring smooth and fuel efficient gear shifting and torque transfer.

Maximises transmission life

Shear stable viscosity index improver resists break down under high shear conditions found in modern transmissions, ensuring that the oil viscosity and film thickness continue to protect the moving components. EP additive minimises wear of transmission parts under all service conditions.

Increased oil life

Superior oxidation inhibitors combined with high performance hydrocracked basestocks provide an exceptional level of oxidation resistance and thermal stability which prevents acid build up, oil thickening and deposit formation.

Wide Range of Applications

Effective EP additive, viscosity characteristics and a wide range of manufacturers' approvals allows use in a variety of automotive, industrial and marine applications. Its wide range of applications minimises inventory and reduces risk of misapplication. Distinctive coloring is effective in highlighting leakage, so specially dyed fluids are not required where leak detection is critical.

PERFORMANCE STANDARDS

SAE	10W
Allison	TES-389, C4 Fluid
Voith	Turbo H55.6335 (G607 list)
Meets former specifications	
General Motors	GMN10055
General Motors	GM 6417M (former DEXRON®-III)

<p>Havoline® ATF-J 2988</p> <p><i>Automatic Transmission Fluid</i></p> <p>DESCRIPTION High performance, multipurpose automatic transmission fluid (ATF) formulated in hydrocracked base oils which provide outstanding oxidation resistance. Specially engineered for Japanese passenger car automatic transmissions which require fluid properties different to conventional ATF.</p> <p>Pack sizes: 200L, 60L, 20L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> Automatic transmissions in the following Japanese and Korean passenger cars and light trucks: <table border="0"> <tr> <td>Daihatsu</td> <td>Mazda</td> </tr> <tr> <td>GM Daewoo</td> <td>Mitsubishi</td> </tr> <tr> <td>Honda</td> <td>Nissan</td> </tr> <tr> <td>Hyundai</td> <td>Subaru</td> </tr> <tr> <td>Isuzu</td> <td>Suzuki</td> </tr> <tr> <td>Kia</td> <td>Toyota (including Lexus)</td> </tr> </table> Continuously Variable Transmissions (CVT) where fitted to passenger cars of engine capacity less than 2.0L. 5-speed automatic transmissions in most European passenger cars (BMW, Mercedes-Benz, VW/Audi, Jaguar). Suitable for service fill in automatic transmissions requiring DEXRON®-III, MERCON® or MERCON® V fluids. <p>BENEFITS Smooth operation Combination of advanced friction modifiers and high viscosity index fluid provides smooth, fuel-efficient gear shifting and shudder-free torque transfer from engine to wheels under all driving conditions.</p> <p>Maximises transmission life Engineered specifically for Japanese design transmissions which feature slip-controlled torque converter lock-up, with precisely balanced friction modifiers to prevent stick-slip vibration that leads to "shudder". Outstanding additive durability ensures continuous anti-shudder protection and wear prevention in critically loaded gears and bearings.</p> <p>Extended oil service life Hydrocracked base oils and advanced performance additives provide exceptional thermal stability and oxidation resistance which prevents oil degradation and formation of deposits. Highly stable viscosity index improver resists breakdown under the high shear conditions typical of modern transmissions and maintains long-term film strength.</p>	Daihatsu	Mazda	GM Daewoo	Mitsubishi	Honda	Nissan	Hyundai	Subaru	Isuzu	Suzuki	Kia	Toyota (including Lexus)	<p>Minimises inventory Meets the JASO 1-A specification, recommended for service fill in the great majority of Japanese and Korean design passenger cars, SUVs and light trucks. Advanced design is additionally suited to smaller CVTs and many late-model European cars.</p> <p>PERFORMANCE STANDARDS JASO M315 Type 1-A Suitable for use where the following fluid specifications are recommended: Honda ATF-Z1 Nissan Matic J Mitsubishi Diamond SP III Toyota T IV</p> <p>SERVICE CONSIDERATIONS To overcome the inherent energy loss associated with the torque converter in conventional 4 & 5-speed automatic transmissions, thereby increasing fuel efficiency, mechanical clutch mechanisms have been widely adapted in nearly all passenger car and SUV designs. Known as slip-controlled or continuously slipping torque converter clutches, these computer-controlled devices have been developed to their greatest extent in recent years by Japanese and Korean OEMs.</p> <p>Critical to smooth operation of the torque converter clutch are the frictional characteristics of the Automatic Transmission Fluid (ATF). If the ATF frictional properties are not correctly matched with clutch plate properties, it can cause the clutch surfaces to momentarily stick and then slip. Occurring in rapid succession, this phenomenon is generally known as "shudder" and can cause the vehicle to vibrate noticeably and potentially lead to transmission damage. Shudder prevention relies on a carefully designed ATF, and a good fluid should maintain anti-shudder protection for many thousands of kilometres.</p> <p>There are wide differences in anti-shudder performance among commercial ATFs, and many are not suited to modern Japanese and Korean transmissions. Japanese genuine ATFs typically exhibit much higher levels of anti-shudder durability than DEXRON®-III type fluids for example. A major reason why OEMs market their own genuine ATF is that they want to ensure correct operation of slipping torque converter clutches.</p> <p>Havoline® ATF-J has not been formally evaluated by vehicle or transmission manufacturers. However through comprehensive in-house bench test validation and vehicle fleet testing, Havoline® ATF-J has been proven to provide equal or better anti-shudder performance and anti-shudder durability than required by the major Japanese OEM fluid specifications, as well as the Japanese industry standard JASO M315 Type 1-A.</p>
Daihatsu	Mazda												
GM Daewoo	Mitsubishi												
Honda	Nissan												
Hyundai	Subaru												
Isuzu	Suzuki												
Kia	Toyota (including Lexus)												
<p>Texamatic® Type F 1356</p> <p><i>Automatic Transmission Fluid</i></p> <p>DESCRIPTION A non-friction modified automatic transmission fluid for older Ford car automatic transmissions (up to 1991) which require Type F or G fluids. Dyed red.</p> <p>Pack size: 20L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> Where Ford Type F (M2C33-F) and Type G (M2C33-G) fluids are recommended. Some Japanese automatic and manual transmissions, JVC Front End Loaders and Chamberlain John Deere crawler hydrostatic transmissions. Manual transmissions, fluid couplings, torque converters and vane and gear type hydraulic pumps where Type F and Type G fluids are recommended. Where a nominally ISO 32 hydraulic fluid is required. 	<p>BENEFITS Maximises equipment life Shear stable viscosity index improver resists break down ensuring viscosity and film thickness protects moving components. Anti-wear additive minimises wear of automatic transmission, compressor and hydraulic pump components.</p> <p>Extended fluid service life Oxidation inhibitors and highly refined basestocks provide oxidation resistance and thermal stability which prevent acid build up, oil thickening, and the formation of gum, varnish and sludge.</p> <p>Reduced downtime Rust and oxidation inhibitors protect precision components in wet or humid conditions.</p> <p>PERFORMANCE STANDARDS Ford ESP-M2C33-F (Type F), ESP-M2C33-G (Type G), SQM-2C9007-AA Denison HF-0 pump performance Vickers M-2950-S pump performance</p>												

<p>Autotrans Fluid BW 1275</p> <p><i>Automatic Transmission Fluid</i></p> <p>DESCRIPTION A special purpose automatic transmission fluid for later model (1992 four speed) Ford automatic transmissions. Dyed red.</p> <p>Pack sizes: 205L, 60L, 20L, 1L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • BTR 95LE four speed automatic transmissions as fitted to the 8 and 6 cylinder Ford Falcon EB, Fairlane NC and LTD DC and subsequent models. • BTR 85LE four speed automatic transmissions fitted to Series 2 six cylinder Ford Falcon EA, Fairlane NA and LTD DA model passenger cars. 	<p>BENEFITS Frictional and lubricity properties needed for the BTR 95 LE and 85LE transmissions. Dyed red for identification.</p> <p>PERFORMANCE STANDARDS ISO Grade 32. (SAE 10W) Suitable for use where the following fluid specifications are recommended: BTR 5M-52, 95LE, 85LE</p>
<p>EasyShift SAE 75W-90 1418</p> <p><i>Manual Transmission Fluid</i></p> <p>DESCRIPTION Shear stable, multigrade manual transmission fluid for Japanese passenger car manual transmissions and transaxles. It may also be used in other manual transmissions fitted to modern passenger car and light commercial vehicles.</p> <p>Pack sizes: 205L, 60L, 20L, 4L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Passenger car and light commercial vehicle manual transmissions and transaxles • Recommended for use in transmissions which have been experiencing "notchy" shift performance at low temperatures. <p>BENEFITS Easy gear selection Combination of friction modifiers, additives and viscosity produce correct frictional characteristics, allowing synchroniser rings and cones to engage properly and enabling light and easy gear shifting</p>	<p>Maximises transmission life Shear stable viscosity index improver does not break down under the high shear stresses of modern transmissions, ensuring oil viscosity and fluid film thickness are sufficient for effective protection of gears against wear and scuffing. Mild extreme pressure additives provide load carrying capacity necessary to minimise wear of components.</p> <p>Saves on maintenance Highly refined base oils and oxidation inhibitors impart thermal and oxidation stability, providing resistance to formation of lacquer, deposits and corrosive acid by-products.</p> <p>Long fluid service life Oxidation stability resists oil degradation and protects against oil thickening and acidity increase.</p> <p>PERFORMANCE STANDARDS API GL-4 Meets individual requirements of major Japanese manual transmission manufacturers</p>
<p>Delo® Synthetic Transmission Fluid SAE 50 3038</p> <p><i>Automotive Synthetic Transmission Oil</i></p> <p>DESCRIPTION Synthetic-based, non-EP heavy-duty manual transmission oil with excellent thermal and oxidation resistance. It is designed to provide protection for heavy-duty manual transmissions which do not require EP type gear oils. The superior properties of the synthetic base fluid are further enhanced with anti-wear agents and rust and oxidation inhibitors.</p> <p>Pack sizes: 20L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • North American type, heavy duty non-synchronised manual transmissions, such as those manufactured by Eaton, ArvinMeritor & Mack. • Especially suitable where operating conditions are severe or where equipment must operate in extremely hot or cold climates. <p>Note. Though not recommended, Delo Synthetic Transmission Fluid will mix with conventional mineral oils.</p>	<p>BENEFITS Minimises operating costs Rapid circulation and reduced drag on gears reduces gear wear, and provides fuel economy benefits.</p> <p>Reduces maintenance Thermal and oxidative stability reduces deposit formation, keeping gears and bearings cleaner and preventing oil film disruption which can result in increased wear rates. Anti-rust additives protect transmission components. High oxidation stability provides extended drain intervals.</p> <p>Minimises inventory costs High viscosity index ensures effective lubrication over a wide range of temperatures. This allows use in a variety of applications.</p> <p>Reduces driver fatigue Excellent low temperature fluidity allows easy engagement of gears under cold start conditions.</p> <p>PERFORMANCE STANDARDS SAE 50 (engine) API MT-1 ArvinMeritor O-81 (Approval pending) Eaton Transmission: PS-164, Rev 7 International TMS 6816 Mack TO-A Plus Roadranger® E500™ (extended drain)</p>

Synthetic Automatic Transmission Fluid Heavy Duty 2915

Automotive Synthetic Transmission Fluid

DESCRIPTION

Multipurpose anti-wear automatic transmission fluid (ATF) formulated in ultra high viscosity index base fluid, with Allison Transmission and Voith Turbo approvals. Specially designed for heavy duty automatic truck and bus transmissions operating in severe service.

Pack sizes: 205L, 20L.

APPLICATIONS

- Car and light truck automatic transmissions.
- Power steering units where the manufacturer recommends a DEXRON® or MERCON® fluid.
- Heavy-duty automatic transmissions on and off-highway.
- Rotary vane and screw type air compressors (where this type of fluid is appropriate).
- Mobile hydraulic systems.
- Industrial anti-wear hydraulic systems.
- Marine anti-wear hydraulic systems.
- Manual transmissions and transaxles where this type of fluid is appropriate.

BENEFITS

Minimises inventory

Effective EP additive, viscosity characteristics and a wide range of manufacturers' approvals allows use in a variety of automotive, industrial and marine applications, reducing risk of misapplication.

Extended oil life

Synthetic base fluid and inhibitor package provide outstanding oxidation resistance and thermal stability which prevents acid build-up, oil thickening and deposit formation and can extend oil drain interval up to four times that of conventional ATF.

Maximises transmission life

Highly stable viscosity index improver resists break down under high shear conditions found in modern transmissions, maintaining oil viscosity and film thickness to protect moving components. Superior antiwear properties and resistance to sludge formation extend the time to transmission overhaul in severe service conditions.

Smooth operation

Combination of synthetic base fluid, special viscosity index improver and advanced friction modifiers provides excellent lubricating qualities at high and low temperatures and smooth shifting and efficient power transfer under all service conditions.

PERFORMANCE STANDARDS

Approvals

Allison	TES-389 (AA-31992007) , C4 fluid (C4-31662005)
Ford	MERCON® V (M5050801)
Voith	Turbo H55.6335 (G607 List)
Voith	Turbo H55.6336 (Extended Drain approved)
MAN	339 Type V1 and Z2
ZF TE-ML	14B

Suitable for use where the following fluid specifications are recommended:

Allison	TES-295
GM	DEXRON®-III (obsolete)
Ford	MERCON® (obsolete)

Torque Fluid 414, 434, 454, 464

Heavy-Duty Powershift Transmission Fluid Series

	414	434	454	464
SAE Grade	10W	30	50	60
Product Code	2711	2119	2120	2712

DESCRIPTION

Non friction modified, heavy-duty transmission fluid series for powershift transmissions and final drives requiring Caterpillar TO-4 fluids.

Pack sizes: 205L, 20L. (Torque Fluid 464 available only in 205L.)

APPLICATIONS

- All Caterpillar powershift transmissions, final drives and marine transmissions
- All Komatsu powershift transmissions
- Mobile hydraulic systems, hydrostatic transmissions, heavy-duty manual transmissions and final drives for which heavy-duty engine oils are specified

Note. The choice of viscosity grade (414, 434, 454 or 464) will depend on ambient temperature conditions and operating severity.

BENEFITS

Longer transmission & equipment life

Anti-wear additives controls wear of critically loaded components. Inhibitor system protects parts from corrosion and rusting. Good compatibility with common seal materials ensures long seal life.

Prolonged oil service life

Highly refined base oil and oxidation inhibitors resist lubricant breakdown under severe operating conditions, minimising varnish and sludge formation.

Maintains correct shifting patterns

Silicone foam inhibitor minimises foam formation while enabling rapid release of entrained air to ensure smooth shifting in powershift transmissions.

Saves on inventory costs

Broad performance qualifications enable use in transmissions, hydraulics and gear cases, reducing inventory to a minimum.

PERFORMANCE STANDARDS

SAE	10W, 30, 50, 60
Caterpillar	TO-4
Eaton Fuller/ Roadranger	(434, 454)
Komatsu	KES 07.868.1 (414, 434, 454)
Volvo	97305-90 (454)
Meritor (Rockwell)	Transmissions (454)
ZF	TE-ML 03C (414, 434)
API	CF (non-engine applications)

NOTE: A blue dyed version of Torque Fluid 414 is available in bulk for greater visibility under product code 2886.

<p>Textran® TDH Premium 2069</p> <p><i>Tractor Fluid</i></p> <p>DESCRIPTION Multi-functional tractor hydraulic fluid (THF) for use in transmissions, final drives and hydraulic systems of modern farm and industrial wheel and crawler tractors and off-road equipment where fluids meeting API GL-4 and major THF specifications are recommended.</p> <p>Pack sizes: 205L, 20L, 4L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Automotive manual transmissions and gearboxes • Where tractor manufacturers specify the use of a THF or UTTO type product • Mixed fleets of agricultural tractors and associated off-road equipment • Enclosed oil immersed (wet) brakes • Power take off (PTO) clutches • Mobile hydraulic systems <p>Not for use as an engine crankcase lubricant</p> <p>BENEFITS Saves on maintenance Highly refined base oils and oxidation inhibitors provide thermal and oxidation stability, providing resistance to formation of lacquer, deposits and corrosive oil degradation by-products. Viscosity characteristics at low temperature ensures rapid oil circulation on start-up, preventing wear.</p>	<p>Smooth and quiet operation Friction modifier allows smooth action of the wet brakes and power take off clutches minimising chatter, stick slip and squawk and ensures maximum brake efficiency.</p> <p>Longer oil life Oxidation stability protects against formation of gums and varnishes, reducing oil thickening and increasing oil life.</p> <p>Maximises transmission life Shear stable formulation maintains film thickness under severe transmission and hydraulic system operation, protecting components against scuffing and wear. Anti-wear additive reduces wear by forming a protective layer on metal surfaces under high load conditions.</p> <p>PERFORMANCE STANDARDS Recommended for applications where any of the following are called for</p> <table border="0"> <tr><td>API</td><td>GL-4</td></tr> <tr><td>Case New Holland</td><td>MAT 3505, MAT 3525</td></tr> <tr><td>Ford</td><td>M2C41-B (power steering)</td></tr> <tr><td>Jl Case</td><td>MS 1209, 1207 & 1206 (now CNH)</td></tr> <tr><td>John Deere</td><td>J20C</td></tr> <tr><td>Massey Ferguson</td><td>M1143, M1135, M1141</td></tr> <tr><td>(former) Ford New Holland</td><td>M2C134-D & M2C86-C</td></tr> <tr><td>Volvo</td><td>97303 (VME WB 101)</td></tr> <tr><td>ZF</td><td>TE-ML 03E (transmissions for off-road equip)</td></tr> <tr><td></td><td>TE-ML 05F (axles for off-road equipment)</td></tr> <tr><td></td><td>TE-ML 06K (tractor transmissions, hydraulic lifts)</td></tr> </table>	API	GL-4	Case New Holland	MAT 3505, MAT 3525	Ford	M2C41-B (power steering)	Jl Case	MS 1209, 1207 & 1206 (now CNH)	John Deere	J20C	Massey Ferguson	M1143, M1135, M1141	(former) Ford New Holland	M2C134-D & M2C86-C	Volvo	97303 (VME WB 101)	ZF	TE-ML 03E (transmissions for off-road equip)		TE-ML 05F (axles for off-road equipment)		TE-ML 06K (tractor transmissions, hydraulic lifts)
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<p>Super Tractor SAE 15W-40 2710</p> <p><i>Universal Tractor Fluid</i></p> <p>DESCRIPTION Shear stable, multigrade super tractor oil universal (STOU) fluid for tractor crankcases, transmissions including wet brakes, final drives and hydraulic systems where API CF, SF and API GL-4 fluids are recommended.</p> <p>Pack sizes: 205L, 20L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Where tractor manufacturers specify an STOU type product. • Mixed fleets of agricultural tractors and associated equipment. • Mobile or stationary diesel engines (except two stroke). • Older style gasoline engines. • Automotive manual transmission gearboxes. • Tractor hydraulics. • Enclosed oil immersed (wet) brakes. • Power take off (PTO) clutches. <p>BENEFITS Minimises application problems Unique multi-application additive package enables use in engines, transmissions, final drives and hydraulic systems, avoiding costly equipment failure due to misapplication.</p> <p>Reduced maintenance costs Outstanding oxidation and nitration resistance minimises acid number increase, providing protection against bearing corrosion.</p>	<p>Extended oil change periods Very high oxidation stability protects against the formation of gums and varnishes, reduces oil thickening and increases oil life.</p> <p>Maintains power output Detergent/dispersant additive system maintains power output by providing deposit control under the high temperature conditions encountered in both naturally aspirated and turbocharged diesel vehicles. Multi-viscosity characteristics ensure rapid oil circulation on start-up, preventing wear which contributes to power loss.</p> <p>Smooth and quiet operation Special friction modifier component allows smooth action of the wet brakes and power take-off clutches, minimising chatter, stick slip and squawk.</p> <p>PERFORMANCE STANDARDS</p> <table border="0"> <tr><td>API</td><td>CF-4, SF</td></tr> <tr><td>API</td><td>GL-4</td></tr> <tr><td>US Military</td><td>MIL-L-2104D, MIL-L-46152B</td></tr> <tr><td>John Deere</td><td>JDM J27</td></tr> <tr><td>Ford</td><td>ESN-M2C-159-B</td></tr> <tr><td>Massey Ferguson</td><td>CMS M1144, M1145</td></tr> <tr><td>ZF</td><td>TE-ML 06B, 07B</td></tr> </table> <p>Meets the performance requirements of:</p> <table border="0"> <tr><td>Caterpillar</td><td>TO-2 (obsolete)</td></tr> <tr><td>John Deere</td><td>JDM J20C</td></tr> <tr><td>Ford</td><td>ESN-M2C134-D</td></tr> <tr><td>Massey Ferguson</td><td>CMS M1135, M1139</td></tr> </table>	API	CF-4, SF	API	GL-4	US Military	MIL-L-2104D, MIL-L-46152B	John Deere	JDM J27	Ford	ESN-M2C-159-B	Massey Ferguson	CMS M1144, M1145	ZF	TE-ML 06B, 07B	Caterpillar	TO-2 (obsolete)	John Deere	JDM J20C	Ford	ESN-M2C134-D	Massey Ferguson	CMS M1135, M1139
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AUTOMOTIVE TRANSMISSION FLUIDS Manual and Heavy Duty

Product	SAE Grade		CODE	Density @ 15°C kg/L	Pour Point °C	Flash Point °C *	Viscosity cSt @		VI
	Gear	Engine					40 °C	100 °C	
Autotrans Fluid BW	70W	10W	1275	0.862	-39	218	38	7.0	149
Delo Synthetic Transmission Fluid SAE 50	90	50	3038	0.86	< -45	221	132	17.5	146
EasyShift	75W-90	-	1418	0.876	-39	>165	95.9	16.4	186
Havoline ATF-J	70W	10W	2988	0.870	-51	>190	36.9	7.3	165
Super Tractor SAE 15W-40	-	15W-40	2710	0.886	-33	>215	113	15.1	139
Synthetic ATF Heavy Duty	70W	10W	2915	0.854	-45	228	35.3	7.4	183
Texamatic 1888	70W	10W	2940	0.855	-51	190	35.8	7.2	168
Texamatic Type F	70W	10W	1356	0.863	-45	185	39	8.1	193
Textran TDH Premium	-	-	2069	0.889	-39	>205	57.5	9.5	148
Torque Fluid 414	70W	10W	2711	0.880	-39	220	40.8	6.5	110
Torque Fluid 434	80W	30	2119	0.903	-30	250	92.6	10.9	102
Torque Fluid 454	90	50	2120	0.909	-18	270	224	19.1	96
Torque Fluid 464	140	60	2712	0.911	-9	270	317	24.0	96

* Cleveland Open Cup Flashpoint

Delo® Gear Lubricant ESI SAE 80W-90 2876

Extreme Pressure, Extended Drain Automotive Gear Oil

DESCRIPTION

Automotive EP gear lubricant, also suitable for many industrial applications. Formulated with ISOSYN™ technology, a combination of special base oils and unique EP additive system incorporating inorganic borate technology, to provide oil life and wear protection far exceeding conventional gear oils under extreme service conditions.

Pack sizes: 205L, 20L.

APPLICATIONS

- Automotive differentials operating in severe service conditions. Particularly recommended for heavy-duty road transport axles exposed to extreme loads and temperatures
- Heavy-duty transmissions where the manufacturer recommends the use of API GL-5 or MT-1 gear lubricants
- Extended drain gear oil applications in on-road and off-road heavy-duty equipment
- In-service top up of limited slip differentials
- Industrial gear sets and bearings where EP type gear lubricants of this viscosity are recommended

BENEFITS

Minimises fleet maintenance costs

Patented borate additive system reduces friction, resulting in cooler operating temperatures, reduced wear and longer life of bearings and seals.

Minimises fleet operating costs

Thermal and oxidation stability extends oil drain capability to more than twice the length of conventional gear oils, even under extreme service conditions. Special low friction properties contribute to reduced fuel consumption.

Extends equipment life

Patented borate EP technology creates an anti-wear film 3 to 5 times thicker than conventional EP additives, providing exceptional protection and longer gear life.

Wide temperature range application

Low temperature flow properties and high temperature stability provide gear and bearing protection under a wide range of operating conditions.

PERFORMANCE STANDARDS

API	GL-5, GL-4, MT-1
SAE	J2360 (former MIL-PRF-2105E)
Dana Spicer	SHAES256 approved for extended drain service
Roadranger	E500™ approved for drive axle extended drain
ArvinMeritor	O-76 approved (bulletin TP-9539) for extended drain
Mack	GO-J and GO-J Plus approved for extended drain

Delo® Synthetic Gear Lubricant SAE 75W-90 and SAE 80W-140 3039, 3040

Extreme Pressure Synthetic Gear Oil

DESCRIPTION

Synthetic EP gear lubricant meeting API GL-5 and MT-1. It is designed to provide performance and protection in automotive gear applications over a very wide temperature range and under extended drain operation.

Pack sizes: 205L (80W-140 only), 200L (75W-90 only), 20L.

APPLICATIONS

- On-road axle and differential applications where operating conditions are severe or where equipment must operate in extremely hot or cold climates
- Axle assemblies and final drives in off-road construction, mining and agricultural equipment where very hot or very cold conditions are encountered
- Extended drain gear oil applications in on-road and off-road heavy-duty equipment
- Industrial gear applications where automotive EP gear lubricants are recommended

BENEFITS

Maximises equipment life

Exceptional thermal stability, combined with an advanced EP system and corrosion inhibitors, maximises life of gear surfaces, bearings and seals.

Reduces maintenance costs

Outstanding thermal and oxidative stability reduces deposit formation under severe operating conditions. This keeps gears and bearings cleaner, preventing oil film disruption which can result in increased wear rates.

Wide temperature application

Excellent low temperature flow properties and outstanding high temperature stability provide gear and bearing protection under the most severe operating conditions all year round.

Reduced disposal costs

Extended service interval enables reduction in the quantity of used lubricant requiring disposal.

PERFORMANCE STANDARDS

API	GL-5, GL-4
API	MT-1
ArvinMeritor	O-76N Extended Drain
Dana (Spicer® Axle)	SHAES-256 Rev C (SAE 75W-90) Rev A (SAE 80W-140)
Eaton Corporation	E500™ PS-163 (SAE 75W-90 only)
Mack	GO-J
SAE	J2360 (formerly MIL-PRF-2105E)

Synthetic Gear Lubricant FM 75W-140 3083

Extreme Pressure Automotive Synthetic Gear Oil

DESCRIPTION

Synthetic extreme pressure gear lubricant incorporating a friction modifier. It is designed to meet the synthetic gear oil specifications of automotive manufacturers such as Ford and General Motors Holden. Synthetic Gear Lubricant FM 75W-140 offers superior high temperature stability and load carrying capacity combined with excellent low temperature fluidity. It has outstanding viscosity/temperature properties and shear stability, as well as resistance to oxidation, corrosion and foaming. It is designed to meet the performance requirements of the API GL-5 classification.

Pack sizes: 20L.

APPLICATIONS

- The lubrication of differentials, including limited slip final drives, manual transmissions, transfer cases, gear cases and other automotive applications requiring API GL-5 SAE 75W-140 and 80W-140 oils, particularly where:
 - Severe or critical automotive gear applications are encountered involving extremely high or low temperatures and heavy loads beyond the capabilities of mineral oils.
 - Extended drain periods are required under normal operating conditions to reduce maintenance and downtime.
- It is friction modified and is recommended for the General Motors Holden VN Commodore and later Series V8 Commodore, Calais, Statesman and Caprice, both limited slip and standard axle versions. It is also recommended for Falcon/Fairmont XR-6 and later model V8 Falcon /Fairmont/Fairlane axles.

Recommendations for additional friction modification or specific lubricant selection for specific models should always be followed.

BENEFITS

Maximises equipment life

Exceptional thermal stability, combined with an advanced EP system and corrosion inhibitors, maximises life of gear surfaces, bearings and seals.

Synthetic

Offers all of the advantages associated with synthetic oils.

Reduces costs and improves fuel economy

Minimises friction and wear, and extends oil drains resulting in extended equipment life and reduced maintenance frequency.

Extremely shear stable

Shear stable even under the high mechanical shearing associated with hypoid and other severe automotive gear applications.

Wide temperature application:

Low temperature fluidity gives improved lubricity and easier gear shifting at cold start up temperatures. Outstanding high temperature stability provides gear and bearing protection under severe operating conditions.

Maximises Equipment Life

Formulated with the sulfur-phosphorus extreme pressure additives to provide load carrying capacity for sustained high speed, heavy duty operations under high torque loading conditions, and minimum gear wear. Has superior oxidation and thermal stability and fully inhibited against foaming.

Multipurpose gear oil

Provides the best possible lubricant to effect rationalisation of gear oil for transmissions, differentials and final drives where an API GL-5 SAE 75W-140 or 80W-140 oil is called for.

PERFORMANCE STANDARDS

API GL-5

Thuban® GL-5 EP SAE 80W-90 and 85W-140

2116, 2117

Extreme Pressure Automotive Gear Oil

DESCRIPTION

Thermally stable, EP automotive gear lubricant formulated with "clean gear" technology for applications where API GL-5/MT-1 performance is required.

Pack sizes: 205L, 60L, 20L, 4L. SAE 80W-90 also available in 1L.

APPLICATIONS

- Automotive hypoid gear differentials operating under high speed and/or low speed, high torque conditions
- Heavy-duty, non-synchronised manual transmissions and transaxles requiring this type of lubricant
- Automotive steering gears
- Top-up of limited-slip differentials after break-in of new or rebuilt units

Not for use where the manufacturer recommends API GL-4 lubricants and advises against the use of API GL-5 lubricants.

BENEFITS

Reduced maintenance costs

"Clean gear" technology suspends sludge and carbonaceous deposits in the gear oil, preventing their deposition on gear components and oil seals, thus avoiding the need for premature overhaul due to deposit-induced seal wear or leakage. Outstanding thermal stability minimises the total amount of deposits that the dispersant has to deal with.

Extended gear equipment life

EP additive system provides load carrying capacity to protect gear equipment against surface distress (i.e., spalling, pitting, scoring and wear) under heavily loaded conditions. Inhibitor system resists corrosion of copper alloys and ferrous metals.

Prolonged oil service life

Highly refined base oil and inhibitor system provides oxidation stability to resist oil degradation and thickening during long periods of severe high temperature operation.

PERFORMANCE STANDARDS

API GL-5, GL-4, MT-1
US Military MIL-PRF-2105E
Mack GO-J

Gear Oil LSD SAE 90 and 140

1835, 2700

Automotive "Limited Slip" Gear Oil

DESCRIPTION

High performance, EP automotive gear oil specifically designed for "limited slip" rear drive differentials, particularly those of the "cone clutch" design. Its special friction properties provide smooth, noise free operation and extended life of these units.

Pack sizes: 205L, 20L. SAE 90 is also available in 60L and 1L.

APPLICATIONS

- Limited slip hypoid differentials in rear wheel drive cars and light trucks, under all operating conditions
- Conventional (non-limited slip) rear wheel drive differentials (appropriate viscosities)

BENEFITS

Quiet, shudder-free operation

Friction modifier system provides lubricity for smooth, non-stick/slip engagement and disengagement of friction elements.

Long gear life

EP additives control gear tooth wear, even under high torque, low speed and shock loading conditions. Rust and corrosion inhibitors prevent component damage by water of condensation or contamination.

Extends "yellow metal" component life

Good thermal stability and corrosion inhibition of the EP system limits corrosion of copper-containing bearings and bushings.

PERFORMANCE STANDARDS

API GL-5
U.S. Military MIL-L-2105B
BTR 5M-31 (SAE 90) (formerly Borg Warner)

RPM Borate® EP Lubricant

Extreme Pressure Gear Oil

ISO Grade	68	150	220	320
Product Code	1344	1340	1341	1342

ISO Grade	460	680	1200
Product Code	1343	1345	1339

* Nominal SAE grade

DESCRIPTION

Automotive EP gear lubricant. Also suitable for many industrial applications. Contains a patented Borate EP additive system and supplemental anti-wear agent to provide wear protection superior to conventional EP gear lubricants. Also contains oxidation, corrosion and foam inhibitors. A "problem solver" for severe gear lubrication applications.

Pack sizes: 205L, 20L. ISO 1200 is available only in 205L. ISO 68 and 680 not available in 205L.

APPLICATIONS

- Automotive differentials and gear cases operating under severe service conditions. Particularly for off-highway and heavy-duty trucking fleets.
- Heavy-duty transmissions where manufacturers recommend API GL-5 lubricants. May also be used in transmission applications where non-EP lubricants are normally recommended.
- Industrial enclosed gears operating under severe conditions, including steel-on-bronze worm gears
- Drive and reduction gearboxes on mills, mixers, crushers, extruders, kilns, stenters, pumps and hoists

Not recommended where excessive water contamination is likely to occur.

BENEFITS

Reduces operating costs

Borate provides a thick, tenacious film which prevents metal-to-metal contact between sliding surfaces under severe conditions. The physical (rather than chemical) EP action of Borate minimises corrosion of ferrous and copper-alloy components, even under high temperature conditions. Equipment maintenance is minimised and downtime is reduced.

Maximises oil drain intervals

Thermal and oxidation stability reduces oil degradation, prolonging lubricant life.

Saves on fuel and power

Reduced friction of the Borate additive and its high load-carrying ability in lower viscosity grades frequently permit use of a lower viscosity grade than conventional gear oils. This results in reduced power loss, giving fuel savings in automotive applications and reduced power consumption in industrial applications.

Reduces inventory costs

Ability to replace non-EP transmission lubricants can allow a single oil to be used in both transmissions and differentials, with reductions in lubricant inventory.

PERFORMANCE STANDARDS

API	GL-5, GL-4 and GL-2
U.S. Military	MIL-L-2105D (ISO 150)
David Brown	Table E Approved: 2E (ISO 68), 4E to 7E (ISO 150 to 460)

Final Drive SAE 60

2944

Heavy-Duty Final Drive and Axle Oil

DESCRIPTION

Premium heavy-duty gear lubricant specifically designed for final drives and axles of modern Caterpillar off-road equipment in severe service, where fluids meeting Cat FD-1 are recommended.

Pack size: 205L.

APPLICATIONS

- Final drives, axles, differentials and front wheels of Caterpillar equipment where FD-1 performance fluid is specified
- Caterpillar heavy-duty off-highway haul trucks
- Caterpillar wheeled and track-type tractors

Not suitable for oil-immersed brakes or clutches

BENEFITS

Extends equipment life in severe service

Additive system minimises wear in heavily loaded gears and bearings by forming a strong protective layer on metal surfaces under extreme conditions.

Prolongs oil life

High thermal and oxidation stability protects against oil thickening and deposit formation and extends oil drain interval by up to 100% compared to conventional TO-4 type fluids.

Minimises unscheduled maintenance

Rust and corrosion inhibitors protect final drive components. Viscosity characteristics at low temperatures ensure rapid oil circulation on start-up, preventing damaging wear.

Trouble-free operation

Compatible with all seal materials and with TO-4 type oils, eliminating risk of operational problems when converting to new lubricant.

PERFORMANCE STANDARDS

Caterpillar	FD-1
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AUTOMOTIVE GEAR OILS

Typical Characteristics

Product	SAE Grade	ISO Grade	CODE	Density @ 15 °C kg/L	Pour Point °C	Flash Point °C *	Viscosity cSt @		VI
							40 °C	100 °C	
Delo Gear Lubricant ESI	80W-90	-	2876	0.887	-33	210	140	14.2	99
Delo Synthetic Gear Lubricant SAE 75W-90	75W-90	-	3039	0.87	-54	180	106	14.9	146
Delo Synthetic Gear Lubricant SAE 80W-140	80W-140	-	3040	0.88	-39	192	275	27.2	130
Final Drive SAE 60	60	-	2944	0.910	-18	>220	335	25.1	97
Gear Oil LSD 90	90	-	1835	0.912	-18	>180	203	18.3	99
Gear Oil LSD 140	140	-	2700	0.917	-12	>198	387	27.8	98
RPM Borate EP Lube 68	80W	68	1344	0.901	-33	> 190	65	8.6	103
RPM Borate EP Lube 150	80W-90	150	1340	0.910	-30	> 190	143	14.6	101
RPM Borate EP Lube 220	85W-90	220	1341	0.913	-21	> 190	210	18.8	100
RPM Borate EP Lube 320	90	320	1342	0.917	-18	> 200	306	23.8	98
RPM Borate EP Lube 460	85W-140	460	1343	0.922	-18	> 200	440	30	97
RPM Borate EP Lube 680	-	680	1345	0.936	-9	> 200	660	40	99
RPM Borate EP Lube 1200	250	"1200"	1339	0.952	-6	> 220	1150	53	92
Synthetic Gear Lubricant FM 75W-140	75W-140	-	3083	0.87	-48	200	190	24	155
Thuban GL-5 EP 80W-90	80W-90	-	2116	0.900	-30	>165	140	15	108
Thuban GL-5 EP 85W-140	85W-140	-	2117	0.908	-15	>180	344	26	97

* Cleveland Open Cup Flashpoint

Delo® Extended Life Coolant Pre-Mixed 50/50

2981

Radiator Coolant, Anti-Freeze & Corrosion Inhibitor

DESCRIPTION

Environmentally sensitive pre-diluted coolant, anti-freeze and corrosion inhibitor, based on extended-life organic acid Carboxylate Technology plus an additional nitrite corrosion inhibitor in ethylene glycol. Provides long-term protection of the cooling systems of heavy and light-duty diesel engines and gasoline engines. Specifically designed for use where the engine manufacturer requires nitrite inhibited product (e.g., Caterpillar). Red in colour.

Pack sizes: 205, 20L

APPLICATIONS

- Heavy-duty diesel engines fitted with “wet” or “dry” liners, in both on and off-highway service
- Light-duty commercial vehicle gasoline and diesel engines
- Passenger car gasoline and diesel engines
- High temperature aluminium engine blocks

Recommended maximum service intervals are:

1,250,000 km or 8 years	Heavy-duty diesel, on-road
15,000 hours or 8 years	Heavy-duty diesel, off-road
250,000 km or 5 years	Passenger car & light truck commercial vehicles

BENEFITS

Complete cooling system protection

Unique Carboxylate Technology inhibitor system provides corrosion protection for all engine and cooling system metals, including aluminium, iron, steel, copper and solder alloys. Selective corrosion protection (only where it is needed) allows the remaining surfaces to be free of inhibitor film for unrestricted heat transfer.

Extended service life

Very low depletion rate of the organic acid inhibitor ensures long-term corrosion protection under all operating conditions.

Reduced maintenance costs

Unique Carboxylate Technology inhibitor system prevents wet liner cavitation erosion, and provides exceptional protection to aluminium surfaces under heat transfer conditions. Fewer abrasive dissolved solids means fewer water pump seal failures.

Saves time and money

One coolant does it all. Very low depletion rate and complete cooling system protection of the organic acid inhibitor removes the need for supplementary additives for cavitation erosion protection, and reduces the need to regularly test inhibitor level and add extra additive to maintain the inhibitor concentration.

PERFORMANCE STANDARDS

Delo Extended Life Coolant Pre-Mixed 50/50 has a wide range of approvals and recommendations, including:

AS	2108:2004 Type A
ASTM	D3306, D4985 and D6210
Caterpillar	EC-1
Cummins	
Freightliner	
International	
Mack Truck	014 GS 17009
PACCAR (Kenworth and DAF trucks)	
Thermo-King	
TMC RP 329	

Meets phosphate-free requirements of European manufacturers.

Meets silicate-free requirements of Japanese manufacturers.

Extended Life Coolant

1308

Radiator Coolant, Anti-Freeze & Corrosion Inhibitor Concentrate

DESCRIPTION

Environmentally sensitive coolant, anti-freeze and corrosion inhibitor, based on extended-life organic acid Carboxylate Technology in ethylene glycol which, when mixed at 50% by volume with water, provides long-term protection of the cooling systems of gasoline and light and heavy-duty diesel engines. Coloured orange.

Pack sizes: 205L, 20L, 4L, 1L.

APPLICATIONS

- Passenger car gasoline and diesel engines
- Light-duty commercial vehicle gasoline and diesel engines
- Heavy-duty diesel engines fitted with “wet” or “dry” liners, in both on and off-highway service
- High temperature aluminium engine blocks

Recommended maximum service intervals are:

250,000 km or 5 years	Passenger car & light truck commercial vehicles
600,000 km or 4 years	Heavy-duty diesel, on-road
8,000 hrs or 4 year	Heavy-duty diesel, off-road

BENEFITS

Reduced maintenance costs

Unique Carboxylate Technology inhibitor system prevents wet liner cavitation erosion, and provides exceptional protection to aluminium surfaces under heat transfer conditions. Fewer abrasive dissolved solids means fewer water pump seal failures.

Extended service life

Very low depletion rate of the organic acid inhibitor ensures long-term corrosion protection under all operating conditions.

Complete cooling system protection

Unique Carboxylate Technology inhibitor system provides corrosion protection for all engine and cooling system metals, including aluminium, iron, steel, copper and solder alloys. Selective corrosion protection (only where it is needed) allows the remaining surfaces to be free of inhibitor film for unrestricted heat transfer.

Saves time and money

One coolant does it all. Very low depletion rate and complete cooling system protection of the organic acid inhibitor removes the need for supplementary additives for cavitation erosion protection, and reduces the need to regularly test inhibitor level and add extra additive to maintain the inhibitor concentration.

PERFORMANCE STANDARDS

Extended Life Coolant has a wide range of approvals and recommendations, including:

AS	2108:2004 Type A
ASTM	D4985 and D3306
Detroit Diesel	
Ford	
General Motors	GM 6277M (DEX-COOL® license)
Isuzu	
Jaguar	
Komatsu	KES 07.892
Land Rover	
Liebherr	MD 1-36-130
MAN	324 Type SNF
Mercedes-Benz trucks	325.3
MTU	MTL 5049 Series 2000/4000 engines
PACCAR (DAF trucks and Leyland trucks)	
Renault trucks	
Scania	
Volkswagen/Audi/SEAT	
Wärtsilä gas engines	

Meets the phosphate-free requirements of European manufacturers.

Meets the silicate-free requirements of Japanese manufacturers.

AUTOMOTIVE COOLANTS

<p>XL Corrosion Inhibitor Concentrate 1602</p> <p><i>Water-Based Corrosion Inhibitor Concentrate</i></p> <p>DESCRIPTION Environmentally sensitive, coolant and corrosion inhibitor concentrate based on extended-life organic acid Carboxylate Technology which, when mixed at 7.5% by volume with water, is suitable for use in stationary power generation, marine engine, and automotive cooling systems where glycol-based antifreeze is not required. Red in colour.</p> <p>Pack sizes: 20L, 500 mL.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Stationary power generation engines • Marine engines • Automotive and transport engines • Construction, earthmoving, mining and quarrying equipment • High temperature aluminium engine blocks • Inhibitor package for central heating systems, hydraulic safety fluids and mining fluids <p>Recommended maximum service intervals, using 7.5% volume with water, are:</p> <table border="0"> <tr> <td>250,000 km or 5 years</td> <td>Passenger car & light truck commercial vehicles</td> </tr> <tr> <td>600,000 km or 4 years</td> <td>Heavy-duty diesel, on-road</td> </tr> <tr> <td>8,000 hrs or 4 years</td> <td>Heavy-duty diesel, off-road</td> </tr> <tr> <td>32,000 hrs</td> <td>Stationary power generation & marine engines</td> </tr> </table> <p>BENEFITS Reduced maintenance costs Unique Carboxylate Technology inhibitor system prevents wet liner cavitation erosion, and provides exceptional protection to aluminium surfaces under heat transfer conditions.</p>	250,000 km or 5 years	Passenger car & light truck commercial vehicles	600,000 km or 4 years	Heavy-duty diesel, on-road	8,000 hrs or 4 years	Heavy-duty diesel, off-road	32,000 hrs	Stationary power generation & marine engines	<p>Complete cooling system protection Unique Carboxylate Technology inhibitor provides corrosion protection in aqueous solutions for all engine and cooling system metals, including aluminium, iron, steel, copper and solder alloys. The corrosion inhibitor prevents wet liner cavitation erosion and protects aluminium heat transfer surfaces.</p> <p>Extended service life Very low depletion rate of the organic acid inhibitor ensures long-term corrosion protection under all operating conditions.</p> <p>Saves time and money Very low depletion rate and complete cooling system protection of the special organic acid inhibitor removes the need for supplementary additives for cavitation erosion protection, and reduces the need to regularly test inhibitor level and add extra additive to maintain the inhibitor concentration.</p> <p>PERFORMANCE STANDARDS XL Corrosion Inhibitor Concentrate has a wide range of approvals and recommendations, including:</p> <table border="0"> <tr> <td>AS</td> <td>2108:2004 Type B</td> </tr> <tr> <td>Detroit Diesel</td> <td></td> </tr> <tr> <td>Deutz</td> <td>TR0199-99-2091 medium & large engines</td> </tr> <tr> <td>Liebherr</td> <td>MD 1-36-130 (DCA)</td> </tr> <tr> <td>MaK</td> <td></td> </tr> <tr> <td>MAN</td> <td>248</td> </tr> <tr> <td>MAN B&W</td> <td>2 and 4-cycle engines</td> </tr> <tr> <td>Mercedes Benz trucks</td> <td>MB 312.0</td> </tr> <tr> <td>MTU</td> <td>MTL 5049 Series 2000/4000 engines</td> </tr> <tr> <td>New Sulzer Diesel</td> <td>2-cycle engines</td> </tr> <tr> <td>Ruston (MAN B&W)</td> <td></td> </tr> <tr> <td>Scania</td> <td></td> </tr> <tr> <td>Ulstein Bergen</td> <td>2.13.01, diesel and gas engines</td> </tr> <tr> <td>Wärtsilä</td> <td>Diesel/gas/dual fuel engines</td> </tr> <tr> <td>Yanmar</td> <td></td> </tr> </table>	AS	2108:2004 Type B	Detroit Diesel		Deutz	TR0199-99-2091 medium & large engines	Liebherr	MD 1-36-130 (DCA)	MaK		MAN	248	MAN B&W	2 and 4-cycle engines	Mercedes Benz trucks	MB 312.0	MTU	MTL 5049 Series 2000/4000 engines	New Sulzer Diesel	2-cycle engines	Ruston (MAN B&W)		Scania		Ulstein Bergen	2.13.01, diesel and gas engines	Wärtsilä	Diesel/gas/dual fuel engines	Yanmar	
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<p>Anti-Freeze Anti-Boil Coolant 1268</p> <p><i>Low Cost Radiator Coolant, Anti-Freeze & Corrosion Inhibitor Concentrate</i></p> <p>DESCRIPTION Lower cost radiator antifreeze and cooling system treatment concentrate offering protection against freezing, boiling and corrosion. An ethylene glycol type treatment which provides year round protection to cooling systems including water pumps, radiators and engines. For best results it is recommended for both diesel and petrol engines at 50% volume with water. It may be used at concentrations down to 35% (-19 °C freezing point and 104 °C boiling point) in petrol engines. Anti-Freeze Anti-Boil Coolant provides protection for up to two years. For best results, cooling systems should be re-treated with Anti-Freeze Anti-Boil Coolant annually. Coloured Green.</p> <p>Pack sizes: 205L, 20L, 4L, 1L.</p>	<p>APPLICATIONS</p> <ul style="list-style-type: none"> • Automotive and transport engines <p>BENEFITS Provides year round protection to cooling systems Protects against freezing (to -37 °C, at 50% volume with water) Protects against boiling. (to 108 °C at 50% Volume with water) Protects against corrosion due to galvanic attack. Suitable for most vehicle cooling systems.</p> <p>PERFORMANCE STANDARDS AS 2108:2004 Type A</p>																																						
<p>Radiator Protector 2043</p> <p><i>Low Cost Premixed Water-Based Corrosion Inhibitor</i></p> <p>DESCRIPTION A pre-diluted low cost corrosion inhibitor for the radiators of cars, trucks and other water cooled petrol and gas engines. Coloured green.</p> <p>Pack sizes: 5L, 1L.</p> <p>APPLICATIONS Designed for use in where water quality is too poor to use a concentrate.</p>	<p>BENEFITS Suitable for most older vehicle cooling systems. No need to add water.</p> <p>PERFORMANCE STANDARDS AS 2108:2004 Type B.</p>																																						

AUTOMOTIVE COOLANTS

Typical Characteristics

Product	CODE	Density@ 15 °C kg/L	Inhibitor type	Glycol type	Colour	Recommended Treat Rate
Anti-Freeze Anti-Boil Coolant	1268	1.12	Hybrid	Ethylene	Green	50%
Delo Extended Life Coolant Pre-Mixed 50/50	2981	1.07	OAT	Ethylene	Red	100%
Extended Life Coolant	1308	1.11	OAT	Ethylene	Orange	50%
Radiator Protector	2043	1.02	Conventional	-	Green	100%
XL Corrosion Inhibitor Concentrate	1602	1.06	OAT	-	Red	7.5%

OAT: Carboxylate (Organic Acid) Technology.

AUTOMOTIVE SPECIALITIES

<p>Anti-Wet and Penetrating Fluid 1270</p> <p><i>Water Displacing Fluid</i></p> <p>DESCRIPTION A blend of specially selected petroleum hydrocarbons and additives formulated to impart water displacing properties and enhanced dielectric characteristics. Other properties include rust and corrosion prevention, lubrication and penetration.</p> <p>Pack sizes: 20L, 300g aerosol.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • To displace moisture from damp or wet ignition systems of motor cars, outboard motors and other spark ignition engines • As a penetrating oil to loosen nuts, bolts, studs etc. Home handyman applications. 	<p>BENEFITS Displaces moisture from damp or wet ignition systems. Easier start-up. Protects against rusting & corrosion. A handy oil for general lubrication. Available in aerosol pack.</p> <p>CAUTION : Highly flammable. DO NOT USE NEAR FIRE OR NAKED FLAME.</p>												
<p>Brake and Clutch Fluid 1287</p> <p><i>Brake Fluid</i></p> <p>DESCRIPTION A moisture resistant high performance disc and drum brake fluid. It is coloured green.</p> <p>Pack sizes: 20L, 4L, 1L, 500 mL</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • All modern hydraulic braking systems and clutches. • For all disc and drum-type brake systems, which call for DOT 4 or DOT 3 performance. 	<p>BENEFITS High boiling point. Moisture resistant. Non-petroleum base. Minimises corrosion. Reduces the tendency to vaporise at elevated temperatures. Suitable for extreme temperature operation in modern braking systems. Maintains superior protective qualities over long service and extreme conditions. Performs equally in arctic cold or extreme desert heat. Gives excellent lubricity and corrosion control</p> <p>PERFORMANCE STANDARDS Meets all the major manufacturers' specifications including:</p> <table border="0"> <tr> <td>AS/NZS</td> <td>1960.1: 1995 Grade 3</td> </tr> <tr> <td>FMVSS</td> <td>No. 116 DOT 4</td> </tr> <tr> <td>Ford</td> <td>ESZ-M6C-55A</td> </tr> <tr> <td>GM</td> <td>HN 1796</td> </tr> <tr> <td>ISO</td> <td>4925</td> </tr> <tr> <td>SAE</td> <td>J1703, J1704</td> </tr> </table>	AS/NZS	1960.1: 1995 Grade 3	FMVSS	No. 116 DOT 4	Ford	ESZ-M6C-55A	GM	HN 1796	ISO	4925	SAE	J1703, J1704
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<p>Caltest Express 2595</p> <p><i>Lubricant Analysis Service</i></p> <p>DESCRIPTION A sophisticated, rapid oil analysis early warning system which has been developed to diagnose impending equipment problems before potentially serious damage occurs.</p> <p>Pack size: 10 sample kits (Express Post).</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • A representative sample of the lubricant is drawn from the particular compartment, and posted to the laboratory. The detailed laboratory report gives results of oil analysis and is evaluated to determine equipment wear, the condition of the oil and to indicate mechanical faults and corrective measures. 	<p>BENEFITS Suitable for all types of mechanical equipment. Monitors the performance of the lubricant and the machinery. Aids prediction of impending major equipment failures. Assists maintenance scheduling. Establishes realistic oil change intervals. Reduces risk of costly unplanned maintenance. Laboratory report returned within 5 working days. Regular reporting enables development of graphical display of equipment condition.</p> <p>Note: To minimise the time for samples to travel to a laboratory, customers in West Australia may purchase a version which is directed to the west coast laboratory. This has product code 2594</p> <p>Note: Caltex offers Caltest Sample Pumps (Code 2519) These pumps fit the Caltest sample bottles, are simple to use and aid clean sampling.</p>												
<p>Techron® 5000 1355</p> <p><i>Engine Cleanliness Fuel Additive</i></p> <p>DESCRIPTION A unique fuel system cleaning and decoking agent based on powerful cleaning additives.</p> <p>Pack size: 350 mL</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • All four stroke petrol and light duty direct injection diesel engine vehicles. • Any vehicle with one of the symptomatic driveability problems such as hard starting, rough running, sluggish acceleration, surging, irregular automatic transmission shifts, reduced fuel economy or increased exhaust emissions. • To keep the entire system clean, use every 5000 km or when the driveability problems recur. • To clean up badly contaminated fuel system more than one treatment may be required. 	<p>BENEFITS Provides a burst of cleaning power that is unbeatable at cleaning the entire fuel system restoring power and performance in petrol and light duty indirect injection diesel engines. Cleans systems. Cleans fouled injectors & carburettors. Removes deposits. Improves performance. Excellent corrosion protection. Not harmful to fuel systems. Each 350 mL pack will treat one tank full of petrol (45L).</p>												

SMALL ENGINE

<p>Two Stroke Lawn Mower Oil 2701 <i>Two-Stroke Motor Oil</i></p> <p>DESCRIPTION All-mineral two-stroke gasoline engine oil formulated with a low ash additive system. Prediluted with a low volatility, low odour solvent to facilitate mixing with gasoline at all temperatures. Designed for engines requiring JASO FB or ISO EGB performance lubricants. Green in colour</p> <p>Pack size: 200 mL.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Two-stroke lawn mower engines • Two-stroke lawn and garden tools, including weedeaters, trimmers, edgers, blowers • Portable two-stroke generators • Oil-injected engines in land-based service where no fuel/oil premixing is required 	<ul style="list-style-type: none"> • Air-cooled, oil-gasoline premix engines at manufacturers' recommended gasoline-to-oil ratios, up to 50:1 <p>Not recommended for marine outboard engines, chainsaw engines, any CNG- or LPG-fuelled two-stroke engines, or two-stroke engines equipped with exhaust catalyst systems. Catalyst protection requires part-synthetic, low-smoke JASO FC performance class oils, such as Havoline Super 2T.</p> <p>BENEFITS Engine protection Good lubricity characteristics help protect against friction, wear and scuffing damage.</p> <p>Long spark plug life Low ash additive system helps reduce spark plug fouling, allowing long spark plug life.</p> <p>PERFORMANCE STANDARDS ISO EGB JASO FB SAE Grade (J1536) F/M 2</p>
<p>Four Stroke Lawn Mower and Stationary Engine Oil 2699 <i>Four Stroke Gardening Implement and Stationary Engine Oil.</i></p> <p>DESCRIPTION A monograde SAE 30 crankcase oil for small petrol and diesel engines. It controls oil consumption and deposits and protects against rust, corrosion and wear, leading to longer engine life.</p> <p>Pack sizes: 4L, 1L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Four stroke petrol lawn mower engines and stationary engines. • Certain Briggs and Stratton engines. • Selected small four stroke petrol and diesel stationary engines. 	<p>BENEFITS Suits most four stroke garden appliances. Specifically for smaller stationary engines. Retains viscosity during the life of the oil.</p> <p>PERFORMANCE STANDARDS SAE 30 API SJ, CD, CF Japanese CD Briggs & Stratton SE, SF, SG SAE 30</p>
<p>Super Outboard 3 2709 <i>Two-Stroke Marine Outboard Motor Oil</i></p> <p>DESCRIPTION Two-stroke, marine outboard motor oil formulated with a special ashless additive system. Pre-diluted with a high flashpoint, low aromatic solvent to facilitate mixing with petrol at all temperatures. Designed for engines requiring NMMA TC-W3® certified lubricants, operating in all service conditions. Dyed blue.</p> <p>Pack sizes: 20L, 4L, 1L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • All water-cooled, two-stroke, marine outboard engines, including the latest designs under warranty protection. • Oil-injected engines. 	<ul style="list-style-type: none"> • Oil-petrol premix engines at all petrol to oil ratios up to and including 100:1. • Air-cooled, two-stroke engines where API TD or NMMA certified oils are specified. <p>BENEFITS Minimises spark plug and engine deposits Easy mix application Stays in solution Dyed Light Blue for ease of identification.</p> <p>PERFORMANCE STANDARDS API TD NMMA TC-W3® (Certification Number RL-29107E) SAE Grade (J1536) F/M 3</p>

TWO-STROKE BLENDING TABLE

Oil/Fuel ratio	5 Litres Petrol	10 Litres Petrol	20 Litres Petrol
25/1	200ml oil	400 ml oil	800 ml oil
50/1	100 ml oil	200 ml oil	400 ml oil
100/1	50 ml oil	100 ml oil	200 ml oil

Typical Characteristics

Product	SAE Grade	CODE	Density @ 15 °C kg/L	Pour Point °C	Flash Point °C	Viscosity cSt @		VI	BN mgKOH/g D2896	Sulfated Ash %m	
						40 °C	100 °C				
Two Stroke Lawnmower Oil	-	2701	JASO FB	0.877	-21	91 ¹	52	7.5	100	1.3	0.06
Four Stroke Lawnmower Oil	30	2699	API SJ/CF	0.894	-21	225 ²	102	11.5	100	10.7	1.5
Super Outboard 3	-	2709	NMMA TC-W3®	0.876	-33	100 ¹	44	7.2	125	5.5	<0.01

¹ Pensky-Martens Closed Cup.

² Cleveland Open Cup.

<p>Textran® TDH Premium 2069</p> <p><i>Tractor Fluid</i></p> <p>DESCRIPTION Multi-functional tractor hydraulic fluid (THF) for use in transmissions, final drives and hydraulic systems of modern farm and industrial wheel and crawler tractors and off-road equipment where fluids meeting API GL-4 and major THF specifications are recommended.</p> <p>Pack sizes: 205L, 20L, 4L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Automotive manual transmissions and gearboxes • Where tractor manufacturers specify the use of a THF or UTTO type product • Mixed fleets of agricultural tractors and associated off-road equipment • Enclosed oil immersed (wet) brakes • Power take off (PTO) clutches • Mobile hydraulic systems <p>Not for use as an engine crankcase lubricant</p> <p>BENEFITS Saves on maintenance Highly refined base oils and oxidation inhibitors provide thermal and oxidation stability, providing resistance to formation of lacquer, deposits and corrosive oil degradation by-products. Viscosity characteristics at low temperature ensures rapid oil circulation on start-up, preventing wear.</p>	<p>Smooth and quiet operation Friction modifier allows smooth action of the wet brakes and power take off clutches minimising chatter, stick slip and squawk and ensures maximum brake efficiency.</p> <p>Longer oil life Oxidation stability protects against formation of gums and varnishes, reducing oil thickening and increasing oil life.</p> <p>Maximises transmission life Shear stable formulation maintains film thickness under severe transmission and hydraulic system operation, protecting components against scuffing and wear. Anti-wear additive reduces wear by forming a protective layer on metal surfaces under high load conditions.</p> <p>PERFORMANCE STANDARDS Recommended for applications where any of the following are called for</p> <table> <tbody> <tr><td>API</td><td>GL-4</td></tr> <tr><td>Case New Holland</td><td>MAT 3505, MAT 3525</td></tr> <tr><td>Ford</td><td>M2C41-B (power steering)</td></tr> <tr><td>Jl Case</td><td>MS 1209, 1207 & 1206 (now CNH)</td></tr> <tr><td>John Deere</td><td>J20C</td></tr> <tr><td>Massey Ferguson</td><td>M1143, M1135, M1141</td></tr> <tr><td>(former) Ford New Holland</td><td>M2C134-D & M2C86-C</td></tr> <tr><td>Volvo</td><td>97303 (VME WB 101)</td></tr> <tr><td>ZF</td><td>TE-ML 03E (transmissions for off-road equip)</td></tr> <tr><td></td><td>TE-ML 05F (axles for off-road equipment)</td></tr> <tr><td></td><td>TE-ML 06K (tractor transmissions, hydraulic lifts)</td></tr> </tbody> </table>	API	GL-4	Case New Holland	MAT 3505, MAT 3525	Ford	M2C41-B (power steering)	Jl Case	MS 1209, 1207 & 1206 (now CNH)	John Deere	J20C	Massey Ferguson	M1143, M1135, M1141	(former) Ford New Holland	M2C134-D & M2C86-C	Volvo	97303 (VME WB 101)	ZF	TE-ML 03E (transmissions for off-road equip)		TE-ML 05F (axles for off-road equipment)		TE-ML 06K (tractor transmissions, hydraulic lifts)
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<p>Super Tractor SAE 15W-40 2710</p> <p><i>Universal Tractor Fluid</i></p> <p>DESCRIPTION Shear stable, multi-viscosity super tractor oil universal (STOU) fluid designed for use in tractor crankcases, transmissions including wet brakes, final drives and hydraulic systems where API CF, SF and API GL-4 fluids are recommended.</p> <p>Pack sizes: 205L, 20L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Where tractor manufacturers specify an STOU type product. • Mixed fleets of agricultural tractors and associated equipment. • Mobile or stationary diesel engines (except two stroke). • Older style gasoline engines. • Automotive manual transmissions gearboxes. • Tractor hydraulics. • Enclosed oil immersed (wet) brakes. • Power take off (PTO) clutches <p>BENEFITS Minimises application problems Unique multi-application additive package enables use in engines, transmissions, final drives and hydraulic systems, avoiding costly equipment failure due to misapplication.</p> <p>Reduced maintenance costs Oxidation and nitration resistance minimises acid number increase, providing protection against bearing corrosion.</p>	<p>Extended oil change periods Oxidation stability protects against formation of gums and varnishes, reduces oil thickening and increases oil life.</p> <p>Maintains power output Detergent/dispersant additives maintain power controlling deposits under high temperature conditions encountered in both naturally aspirated and turbocharged diesel vehicles. Multi-viscosity characteristics ensure rapid oil circulation on start-up, preventing wear.</p> <p>Smooth and quiet operation Special friction modifier component allows smooth action of the wet brakes and power take-off clutches, minimising chatter, stick slip and squawk.</p> <p>PERFORMANCE STANDARDS</p> <table> <tbody> <tr><td>API</td><td>CF-4, SF</td></tr> <tr><td>API</td><td>GL-4</td></tr> <tr><td>US Military</td><td>MIL-L-2104D, MIL-L-46152B</td></tr> <tr><td>John Deere</td><td>JDM J27</td></tr> <tr><td>Ford</td><td>ESN-M2C-159-B</td></tr> <tr><td>Massey Ferguson</td><td>CMS M1144, M1145</td></tr> <tr><td>ZF</td><td>TE-ML 06B, 07B</td></tr> </tbody> </table> <p>Meets the performance requirements of:</p> <table> <tbody> <tr><td>Caterpillar</td><td>TO-2 (obsolete)</td></tr> <tr><td>John Deere</td><td>JDM J20C</td></tr> <tr><td>Ford</td><td>ESN-M2C134-D</td></tr> <tr><td>Massey Ferguson</td><td>CMS M1135, M1139</td></tr> </tbody> </table>	API	CF-4, SF	API	GL-4	US Military	MIL-L-2104D, MIL-L-46152B	John Deere	JDM J27	Ford	ESN-M2C-159-B	Massey Ferguson	CMS M1144, M1145	ZF	TE-ML 06B, 07B	Caterpillar	TO-2 (obsolete)	John Deere	JDM J20C	Ford	ESN-M2C134-D	Massey Ferguson	CMS M1135, M1139
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FARMING CANE HARVESTOR HYDRAULIC FLUID

Premium Harvester Hydraulic Oil

1498

High Shear Stability High VI Hydraulic Fluid

DESCRIPTION

An extremely shear stable high viscosity index hydraulic oil with enhanced air release/anti-foam, wear control and corrosion protection properties.

Pack size: 205L.

APPLICATIONS

- Austoft cane harvesters.
- Cameco Down Under cane harvesters.
- Any ISO 68 application where both high shear stability and high viscosity index are recommended.

BENEFITS

Enhanced wear control

Antiwear additives protect critical areas such as the pump, thereby increasing equipment reliability, enhancing performance and reducing maintenance down time.

Improved shear stability

Ensures the viscosity remains constant throughout extended service. This preserves the lubricity necessary to minimise pump leakage and wear.

Superior air release/anti foam

Foam inhibitors minimise foam and aid in the release of entrained air reducing the risk of oil starvation at pump inlets, thus providing superior protection of vital components and reduced down time.

Excellent rust and corrosion protection

Fortified with rust and corrosion inhibitors.

Advanced multigrade formulation

Attains peak performance quickly during cold start up and maintains fluid viscosity at operating temperatures.

Oxidation resistance

Antioxidant additives resist oil thickening and the formation of harmful deposits giving long service life.

PERFORMANCE STANDARDS

ISO 68

Meets the performance requirements of:

- Austoft cane harvesters
- Cameco Down Under cane harvesters.

Typical Characteristics

Product	Grade	CODE	Density @ 15 °C kg/L	Pour Point °C	Flash Point °C *	Viscosity cSt @		VI
						40 °C	100 °C	
Super Tractor 15W-40	SAE 15W-40	2710	0.886	-33	>215	113	15.1	139
Textran TDH Premium	-	2069	0.889	-39	>205	57.5	9.5	148
Premium Harvester Hydraulic Oil	ISO 68	1498	0.882	-33	226	74	12.1	161

* Cleveland Open Cup Flashpoint

FARMING COTTON PICKER PRODUCTS

<p>Cotton Picker Spindle Cleaner 1370</p> <p><i>Emulsifiable Cleaning Oil</i></p> <p>DESCRIPTION Cotton Picker Spindle Cleaner is a low viscosity, water emulsifiable oil formulated to clean the spindles of cotton picking machinery. It is a highly refined paraffinic base oil containing an emulsifier package.</p> <p>Pack sizes: 205L, 20L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> Designed for use at between 0.1% and 1.0% volume with water (depending on flow rate) in all centralised spindle cleaning systems of modern mechanical cotton pickers. Cotton Picker Spindle Cleaner removes sap (which comes from the stalks and stems of plants) and dirt from the spindle blades and keeps them clean. 	<p>BENEFITS Excellent detergency. Removes and prevents the build up of sap and dirt.</p> <p>Mixes readily with water Mixes irrespective of water hardness, with minimal agitation. Continual agitation of the tank is not required after initial mixing.</p> <p>Residue free Does not produce any residue or deposit that can clog nozzles, lines and filters.</p> <p>DOSAGE RATES Cotton Picker Spindle Cleaner can be used at a range of concentrations. For situations where small volumes of water are used (to increase lint yield), Cotton Picker Spindle Cleaner can be used at 1% vol. If larger volumes of water are used as little as 0.1% volume may be used to maintain spindle cleanliness.</p>
<p>Premium Cotton Picker Grease 1056</p> <p><i>Cotton Picker Grease</i></p> <p>DESCRIPTION Light green, smooth textured grease formulated to provide protection from wear, rust and corrosion as well as ensuring freedom from sticky, water soluble deposits. An extreme pressure additive helps reduce sliding wear throughout the mechanism of the cotton picker.</p> <p>Pack size: 175kg..</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> Picker spindles, picker bars and chassis bearings of Case, IHC and John Deere mechanical cotton pickers. Usable temperature range in continuous service is -30 to 100 °C. <p>BENEFITS Low consumption Consistency provides full lubrication, while reducing wastage.</p> <p>Less cotton stain Grease does not leak or splash on cotton.</p>	<p>Corrosion resistance Prevents corrosion due to its good metal surface adhesion, resists corrosive action of plant juices and leaves a protective coating when pickers are not in use. It is specially inhibited to resist corrosion of copper and brass. Resists water washing therefore protecting the bearings from moisture and corrosion.</p> <p>Longer component life Reduces wear, providing longer life for bearings and spindle gears.</p> <p>Low starting resistance Ensures low starting resistance in colder weather and correct picker speed operation, as good penetration into bearings is provided by the use of a low viscosity base oil, allowing the picker to start easily with minimum wear and permitting high speed operation even at low ambient temperatures.</p> <p>PERFORMANCE STANDARDS JI Case B-27 John Deere JD 305, JD 360</p>

Typical Characteristics

Product	NLGI Grade	CODE	Thickener	Colour	Pen Worked mm/10	Drop Point °C	Operating Temp °C	Base Oil Viscosity cSt @ 40 °C	Timken OK Load	Additives
Premium Cotton Picker Grease	00	1056	Lithium	Light green	415	Semi-Fluid	-30 to 100	23	-	EP

Product	CODE	Density @ 15 °C kg/L	Flash Point °C	Viscosity cSt @ 40°C
Cotton Picker Spindle Cleaner	2710	0.85	>150	12.3

FARMING CROP PROTECTION OILS Adjuvants/Carriers

All Caltex Agricultural Spray Oils are registered nationally by the Australian Pesticides & Veterinary Medicines Authority.

<p>Broadcoat 2568</p> <p>DESCRIPTION An emulsifiable, anti-evaporant spray oil/wetting agent used as an adjuvant or carrier for non-selective, knock-down herbicides in pre-crop emergent applications. It is formulated on heavy base oils and is particularly suited to broadacre applications.</p> <p>Pack sizes: 1000L, 205L, 110L, 20L.</p>	<p>D-C-Trate 1373</p> <p>DESCRIPTION A spray oil/wetting agent specifically designed as an adjuvant or carrier to enable certain herbicides and other crop protection chemicals to be applied more effectively by spraying. The emulsifier system promotes optimum uptake and efficiency.</p> <p>Pack sizes: 1000L, 205L, 20L.</p>
<p>D-C-Trate Advance 2908</p> <p>DESCRIPTION An emulsifiable, crop-oil concentrate used as an adjuvant or wetter to enable certain herbicides to be applied more effectively by spraying. It contains a high level of surfactants which have been selected based on their ability to reduce droplet surface tension and promote uptake of active ingredients through the protective cuticle layer of a targeted weed.</p> <p>Pack size: 1000L, 20L.</p>	<p>D-C-Tron Cotton 1374</p> <p>DESCRIPTION A special blend of light base oil and emulsifiers specifically designed for use with ULV insecticides and with Dropp[®] defoliant in cotton crops.</p> <p>Pack size: 1000L, 205L, 20L.</p>

FARMING CROP PROTECTION OILS Pesticidal Spray Oils

<p>Bioclear 2920</p> <p>DESCRIPTION A new, very highly refined, narrow range, emulsifiable paraffinic spray oil insecticide. Bioclear is registered with the APVMA for use on a range of crops and ornamentals including citrus, bananas, grapes, pome fruit, stone, tropical fruit and nuts.</p> <p>Pack sizes: 1000L, 205L, 20L.</p>	<p>Canopy 2853</p> <p>DESCRIPTION An efficacious, emulsifiable paraffinic spray oil insecticide especially designed to control cotton pests. Canopy is registered with the APVMA for control of heliothis, aphids and green mirids. Canopy is also registered as a defoliation aid at 0.5L/ha.</p> <p>Pack sizes: 1000L, 205L, 20L.</p>
<p>D-C-Tron Plus 1380</p> <p>DESCRIPTION A narrow- range emulsifiable spray oil containing additives which reduce the risk of phytotoxicity. It will control a wide variety of pests and diseases on citrus, pome and stone fruit trees and bananas. It may also be used on ornamental shrubs and deciduous trees during the dormant and semi-dormant periods and also as a banana spray oil.</p> <p>Pack sizes: 1000L, 205L, 20L.</p>	<p>Summer Spray Oil 1622</p> <p>DESCRIPTION A light narrow-range emulsifiable spray oil for summer applications to citrus crops.</p> <p>Pack sizes: 1000L, 205L, 20L.</p>
<p>Winter Spray Oil 1721</p> <p>DESCRIPTION Heavy emulsifiable spray oil for the control of pests and diseases on deciduous plants during their dormant phase.</p> <p>Pack sizes: 1000L, 205L, 20L.</p>	

GAS ENGINE OILS ENGINE OILS Heavy Duty

Caltex markets two ranges of Gas Engine Oils. Where operational parameters demand the best performing product that ensures exceptional oxidation and nitration resistance, extended oil and filter life, outstanding wear protection and lowest total operating cost, the HDAX series are the products of choice. The HDAX series consists of a low and a medium ash oil as well as one specifically formulated for landfill gas. For applications where cost is a key factor the Geotex range offers robust performance and a level of OEM recommendation. The Geotex range includes an ashless, a low ash and a medium ash product as well as one specifically formulated for landfill gas.

HDAX® Low Ash Gas Engine Oil SAE 40 2916

Gas Engine Oil

DESCRIPTION

Premium performance, heavy-duty, low ash crankcase oil specifically designed to lubricate a wide range of four-stroke natural gas engines where low ash oils are recommended. Formulated with ISOSYN™ base oils and the latest additive technology to provide exceptional oxidation and nitration resistance, extended oil and filter life, and outstanding wear protection.

Pack sizes: 205L.

APPLICATIONS

- Four-stroke stationary spark ignition engines operating on natural gas, including:
 - Caterpillar
 - GE Jenbacher
 - Wärtsilä
 - Waukesha
- Four-stroke stationary engines operating on LPG
- Four-stroke stationary dual-fuel engines
- Four-stroke gas engines in gas compression, generation and co-generation service.

BENEFITS

Maximises oil service life

Synergy of ISOSYN™ base oils, oxidation inhibitor package and dispersant provides outstanding oxidation and nitration resistance, reducing the build-up of sludge which leads to oil thickening and filter blockage.

Lowers operating costs

Excellent deposit control on valves and piston reduces oil consumption. Exceptional oxidation and nitration resistance and deposit control extends oil drain capability so that equipment is in service longer generating revenue. Outstanding valve train wear protection maintains fuel economy.

Minimises maintenance costs

Exceptional oxidation resistance and dispersancy minimises sludge formation, avoiding filter plugging, cylinder head sludge, abrasive polishing wear and oil thickening.

Extends engine life to overhaul

High level of anti-wear additive protects against valve train wear and scuffing of highly loaded parts operating under boundary lubrication conditions. Level and type of ash producing additives reduce valve recession and keeps combustion chamber deposits to a minimum with less spark plug fouling and potential for pre-ignition.

PERFORMANCE STANDARDS

API	CF, CD
Caterpillar	gas engine requirements
Jenbacher	approval (TI 1000-1107)
Wärtsilä	approval for SG and DF engines
Waukesha	cogeneration approval
Waukesha	low ash requirements

HDAX® LFG Gas Engine Oil SAE 40 2913

Gas Engine Oil

DESCRIPTION

Premium quality, medium ash, dispersant/detergent type gas engine oil formulated especially for four stroke landfill gas applications. Superior ISOSYN™ technology, including a combination of high performance hydrocracked base fluids and a robust inhibitor package provides exceptional protection and maximised oil drain intervals even in the presence of the most aggressive landfill gases.

Pack size: 205L.

APPLICATIONS

- Four-stroke engines fuelled by landfill gas containing elevated levels of chlorofluorocarbons (CFCs).
- Sour gas applications where corrosive wear is a special concern.
- Engines where an increased ash level are preferred for improved valve recession control.
- Sweet gas applications where a high base number is preferred and will deliver extended drain intervals

BENEFITS

Maximises oil service life

ISOSYN™ technology, including a combination of high performance hydrocracked base fluids and specially balanced oxidation inhibitor package and dispersant provides outstanding oxidation and nitration resistance in conventional sweet gas applications and more arduous landfill applications.

Lowers operating costs

Excellent deposit control on valves and pistons reduces oil consumption. The exceptional oxidation and nitration resistance and deposit control extends oil drain capability so that equipment is in service longer generating revenue.

Minimises maintenance costs

Exceptional oxidation resistance and dispersancy minimises sludge formation, avoids filter plugging, cylinder head sludge, abrasive polishing wear and oil thickening. Special formulation gives excellent corrosion control in engines burning high CFC and / or high sulfur containing fuels where high levels of acidic condensate form. This exceptional corrosion control ensures maximum liner life even in intermittent operation. Valve recession is controlled over low ash formulations in those engines where medium ash oils are preferred.

Extends engine life to overhaul

High level of anti-wear additive protects against valve train wear and scuffing of highly loaded parts operating under boundary lubrication conditions. Level and type of ash producing additives reduce valve recession and keep combustion chamber deposits to a minimum with less spark plug fouling and potential for pre-ignition. NSCR catalyst compatibility ensures maximum catalyst life. Longer engine life between overhauls increases total engine availability and overall revenue generation and profit.

PERFORMANCE STANDARDS

API	CD
Jenbacher	landfill and biogas approval
Waukesha	landfill gas approval

<p>HDAX® Medium Ash Gas Engine Oil 2951</p> <p>SAE 40</p> <p>DESCRIPTION Heavy-duty, high alkalinity reserve medium ash crankcase oil designed to lubricate a wide range of four-stroke engines burning sour gas or digester gas (biogas), and some dual-fuel, pilot-injected engines where medium ash oils are recommended. Formulated with ISOSYN™ base oils and advanced additive chemistry, to provide oxidation and nitration resistance, extended oil and filter life, and wear protection.</p> <p>Pack size: 205L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Four-cycle spark ignition industrial gas engines • Digester gas (biogas) engines • Stationary compression ignition dual fuel engines <p>BENEFITS Maximises oil service life Synergy of ISOSYN™ base oils, oxidation inhibitor package and dispersant provides oxidation and nitration resistance, reducing the build-up of sludge which lead to oil thickening and filter blockage.</p>	<p>Lowers operating costs Control of deposits on valves and piston reduces oil consumption. Oxidation and nitration resistance and deposit control extends oil drain capability so equipment is in service longer generating revenue. Valve train wear protection maintains fuel economy.</p> <p>Minimises maintenance costs Exceptional oxidation resistance and dispersancy minimises sludge formation, avoiding filter plugging, cylinder head sludge, abrasive polishing wear and oil thickening.</p> <p>Extends engine life to overhaul High level of anti-wear additive protects against valve train wear and scuffing of highly loaded parts operating under boundary lubrication conditions. Level and type of ash producing additives reduce valve recession.</p> <p>Maximises oil change periods High level of alkalinity reserve ensures that corrosive acids formed by the combustion process are neutralised</p> <p>PERFORMANCE STANDARDS API CD</p>
<p>Geotex® Ashless SAE 40 2955</p> <p><i>Gas Engine Oil</i></p> <p>DESCRIPTION Heavy-duty, ashless crankcase oil specially designed for use in ash sensitive, two-cycle and older four-cycle, spark ignition, LPG or natural gas stationary engines.</p> <p>Pack size: 205L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Two-cycle stationary engines fuelled by sweet natural gas or LPG. • Older, four-cycle stationary engines fuelled by sweet natural gas or LPG. <p>BENEFITS Maximises engine life Balanced additive package provides excellent piston deposit control. Ashless formulation minimises surface deposits on valves, spark plugs and combustion chambers.</p>	<p>Reduced maintenance costs Outstanding oxidation and nitration resistance minimises acid number increase, providing protection against bearing corrosion.</p> <p>Extended oil change periods Very high oxidation stability protects against the formation of gum and varnish, reduces oil thickening and increases oil life.</p> <p>PERFORMANCE STANDARDS Meets the requirements of the following gas engine manufacturers: Ajax Caterpillar (except 3400, 3500 or 3600 series) Clark-Dresser Cooper Bessemer (two-cycle) Dresser-Rand (Ingersoll-Rand) (two-cycle) Fairbanks-Morse/MEP Worthington (four-cycle)</p>
<p>Geotex® LA SAE 40 2954</p> <p><i>Gas Engine Oil</i></p> <p>DESCRIPTION Heavy-duty, low ash, monograde crankcase oil designed to lubricate a wide range of spark ignition, natural gas engines where low ash oils are recommended.</p> <p>Pack size: 205L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Four-cycle stationary engines operating on sweet natural gas or LPG. • Certain two-cycle stationary engines operating on sweet natural gas or LPG. • Gas powered co-generation engines. <p>BENEFITS Maximises engine life Detergent additive provides excellent piston deposit control. Balanced sulfated ash level reduces valve surface deposits.</p>	<p>Reduced maintenance costs Outstanding oxidation and nitration resistance minimises acid number increase, providing protection against bearing corrosion.</p> <p>Extended oil change periods Very high oxidation stability protects against the formation of gums and varnishes, reduces oil thickening and increases oil life.</p> <p>Increased service life Low phosphorus content ensures exhaust system catalyst compatibility and, therefore, maximises the unit's service life.</p> <p>PERFORMANCE STANDARDS API CD Caterpillar gas engine requirements Deutz approval for gases with low contamination levels Jenbacher approval (T1 1000-1107) Wärtsilä SG and DF (approved) Waukesha low ash requirements</p>

<p>Geotex® LF SAE 40 2952</p> <p><i>Gas Engine Oil</i></p> <p>DESCRIPTION Heavy-duty, high alkalinity reserve, monograde crankcase oil specially designed to lubricate four cycle spark ignition engines burning landfill gas and sour natural gas where lubricants at the high end of the medium ash range are recommended.</p> <p>Pack size: 205L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Four-cycle, spark ignition industrial landfill stationary gas engines • Spark or pilot ignition engines burning sour natural gas or digester gas (biogas) 	<p>BENEFITS</p> <p>Maximises oil change periods High level of alkaline reserve ensures that corrosive acids formed by the combustion process are neutralized.</p> <p>Reduced maintenance costs Outstanding oxidation and nitration resistance minimises acid number increase, providing protection against bearing corrosion.</p> <p>Maximises engine life Detergent additive provides excellent piston deposit control. Balanced sulfated ash level reduces valve surface deposits.</p> <p>PERFORMANCE STANDARDS</p> <table> <tr> <td>API</td> <td>CD</td> </tr> <tr> <td>Deutz</td> <td>0199 - 99 - 2105/7 EN: Released lubricating oils with a sulfate ash content of 0.5 wt.% to 1.0 wt.%</td> </tr> </table>	API	CD	Deutz	0199 - 99 - 2105/7 EN: Released lubricating oils with a sulfate ash content of 0.5 wt.% to 1.0 wt.%
API	CD				
Deutz	0199 - 99 - 2105/7 EN: Released lubricating oils with a sulfate ash content of 0.5 wt.% to 1.0 wt.%				
<p>Geotex® HD SAE 40 3020</p> <p><i>Gas Engine Oil</i></p> <p>DESCRIPTION Heavy-duty, high alkalinity reserve, monograde crankcase oil specifically designed to lubricate European four-cycle spark ignition engines burning natural gas, digester gas (biogas) or liquid petroleum gas (LPG) and engines where medium ash lubricants are recommended.</p> <p>Pack size: 205L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Four-cycle, spark ignition industrial gas engines • Digester gas (biogas) engines • Stationary compression ignition dual-fuel engines • Gas powered co-generation engines • Recommended for many European stationary four-cycle engines 	<p>BENEFITS</p> <p>Maximises engine life. Detergent additive provides excellent piston deposit control. Balanced sulfated ash level reduces valve surface deposits.</p> <p>Reduced maintenance costs Outstanding oxidation and nitration resistance minimises acid number increase, providing protection against bearing corrosion.</p> <p>Maximises oil change periods High level of alkaline reserve ensures that corrosive acids formed by the combustion process are neutralised. Highly effective oxidation inhibitor minimises oil thickening in service.</p> <p>PERFORMANCE STANDARDS</p> <table> <tr> <td>API</td> <td>CD</td> </tr> <tr> <td>Jenbacher</td> <td>TI 1000-1106 approval for four-cycle engines</td> </tr> </table>	API	CD	Jenbacher	TI 1000-1106 approval for four-cycle engines
API	CD				
Jenbacher	TI 1000-1106 approval for four-cycle engines				
<p>RPM Gas Engine Oil SAE 15W-40 3046</p> <p><i>Multigrade Gas Engine Oil</i></p> <p>DESCRIPTION A premium quality heavy duty multigrade gas engine oil for use in engines running on compressed natural gas (CNG), liquefied natural gas (LNG), and liquefied petroleum gas (LPG).</p> <p>Pack size: 205L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Medium and heavy duty vehicles powered by natural gas and propane-fuelled engines where engine manufacturers recommend a low ash lubricant with improved valve train wear performance. • Cummins B5.9G and C8.3G alternative fuel engines. • Detroit Diesel Series 50G, 60G alternative fuel engines. 	<p>BENEFITS</p> <p>Low wear Protection against piston, ring, and liner scuffing, scoring, and wear, including wear protection for slider follower valve trains in alternative fuel engines.</p> <p>Clean crankcases and top decks Oxidation and nitration resistance reduces the build-up of insolubles and provide extended oil and filter life. This minimises the formation of sludge in the crankcase and in the valve rocker cover/top deck area.</p> <p>Reduced valve recession The level and type of ash producing additives in this oil provides minimum valve recession with low levels of combustion chamber deposits to minimise the potential for pre-ignition and spark plug fouling.</p> <p>Excellent piston and ring belt deposit control An optimised blend of detergents, dispersants, and inhibitors provides deposit control throughout the entire engine.</p> <p>PERFORMANCE STANDARDS</p> <table> <tr> <td>Cummins</td> <td>CES 20074 (B5.9G and C8.3G only)</td> </tr> <tr> <td>Detroit Diesel</td> <td>7SE272-9510 (Series 50G and 60G only)</td> </tr> </table>	Cummins	CES 20074 (B5.9G and C8.3G only)	Detroit Diesel	7SE272-9510 (Series 50G and 60G only)
Cummins	CES 20074 (B5.9G and C8.3G only)				
Detroit Diesel	7SE272-9510 (Series 50G and 60G only)				

Typical Characteristics

GAS ENGINE OILS ENGINE OILS Heavy Duty

Product	SAE Grade	CODE	Density @ 15 °C kg/L	Pour Point °C	Flash Point °C *	Viscosity cSt @		VI	BN mgKOH/g D2896	Sulfated Ash %m
						40 °C	100 °C			
Geotex Ashless	40	2955	0.89	-18	>225	119	12.7	99	2.2	0.01
Geotex LA	40	2954	0.896	-18	>225	125	13.2	99	5.2	0.49
Geotex LF	40	2952	0.899	-15	>225	139	14.0	97	8.0	0.99
Geotex HD	40	3020	0.895	-18	>220	126	13.0	96	7.0	0.77
HDAX Low Ash Gas Engine Oil	40	2916	0.881	-18	>225	124	13.5	104	4.2	0.5
HDAX LFG Gas Engine Oil	40	2913	0.886	-18	>215	144	15.1	105	6.0	0.7
HDAX Medium Ash Gas Engine Oil	40	2951	0.886	-18	>230	129	13.6	100	6.2	0.7
RPM Gas Engine Oil	15W-40	3046	0.876	-36	230	115	15	136	5.1	0.55

* Cleveland Open Cup Flashpoint

<p>Taro® Special HT 70 2873</p> <p><i>Marine Crosshead Diesel Engine Cylinder Oil</i></p> <p>DESCRIPTION 70 BN SAE 50 cylinder lubricant for lubricating slow-speed engines at very high mechanical and thermal loads. It is blended from highly refined, paraffinic base oils and carefully selected additives to provide superior ring and liner wear protection and excellent piston cleanliness in slow-speed crosshead engines. Taro Special HT 70 has been developed specifically for high-pressure and high-temperature applications.</p> <p>Pack size: 205L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> Lubricating the cylinders of all large slow-speed marine diesel engines continuously using low sulfur fuel and operating at high specific power outputs and high thermal loads. Latest generation MAN Diesel, Wärtsilä and Mitsubishi Heavy Industries engines. 	<p>BENEFITS</p> <p>Wear Protection Ensures protection against excessive cylinder liner and piston ring wear, thus allowing prolonged service intervals.</p> <p>Detergent/Dispersant Properties Prevents ring sticking and minimises deposit formation throughout the combustion chamber exhaust areas.</p> <p>Excellent Lubrication Properties Maintains an oil film under severe, high load conditions, thereby reducing frictional wear and preventing scuffing of liners, pistons and rings.</p> <p>Storage Stability Completely stable at all ambient temperatures. Will not separate or deteriorate in long-term storage.</p> <p>Compatibility Fully miscible and compatible with single-phase alkaline diesel cylinder lubricants generally known to the international marine trade.</p> <p>PERFORMANCE STANDARDS Approved by MAN Diesel, Wärtsilä and Mitsubishi Heavy Industries for use in the latest generation engine designs.</p>
<p>Taro® Special HT LS 40 3003</p> <p><i>Marine Crosshead Diesel Engine Cylinder Oil</i></p> <p>DESCRIPTION 40 BN SAE 50 cylinder lubricant particularly intended for lubricating the cylinders of the latest generation slow-speed engines using low sulfur fuel (<1.5 to 2 wt%) and operating at very high mechanical and thermal loads reaching up to 160 bar in maximum cylinder pressure and up to 270 °C in liner temperature at top dead centre. Blended from highly refined, paraffinic base oils and carefully selected additives to provide superior ring and liner wear protection and excellent piston cleanliness in slow-speed crosshead engines. Taro Special HT LS 40 has been developed specifically for high-pressure and high-temperature applications.</p> <p>Pack size: 205L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> Cylinder lubrication of all slow-speed marine diesel engines continuously using low sulfur fuel and operating at high specific power outputs and high thermal loads. (Running on low sulfur fuel requires the reduction of base introduced into the cylinder. This can be achieved by optimising the oil feed rate or selecting a diesel cylinder lubricant with a lower base number.) 	<p>BENEFITS</p> <p>Wear Protection Ensures protection against excessive cylinder liner and piston ring wear, thus allowing prolonged service intervals.</p> <p>Detergent/Dispersant Properties Prevents ring sticking and minimises deposit formation throughout the combustion chamber exhaust areas.</p> <p>Excellent Lubrication Properties Maintains an oil film under severe, high load conditions, thereby reducing frictional wear and preventing scuffing of liners, pistons and rings.</p> <p>Storage Stability Completely stable at all ambient temperatures. Will not separate or deteriorate in long-term storage.</p> <p>Compatibility Fully miscible and compatible with single-phase alkaline diesel cylinder lubricants generally known to the international marine trade.</p> <p>PERFORMANCE STANDARDS Approved by: MAN Diesel Wärtsilä.</p>
<p>Veritas 800 Marine SAE 30 1388</p> <p><i>Alkaline, Low Speed Diesel Engine System Oil</i></p> <p>DESCRIPTION Premium quality, alkaline diesel engine oil designed for crankcase (system) lubrication of large, low speed diesel engines in marine and stationary applications.</p> <p>Pack size: 205L.</p> <p>APPLICATIONS Crankcase lubrication of:</p> <ul style="list-style-type: none"> Large, low speed (less than 250 rpm), two-cycle crosshead diesel engines. Particularly suitable for engines with oil-cooled pistons. Older-type marine trunk piston engines with separate cylinder lubrication. Marine and stationary applications. <p>Due to ingress of higher viscosity cylinder drip oil into the SAE 30 system oil, the viscosity often shows an increase.</p> <p>BENEFITS Extends time between overhauls Detergent and ashless dispersant additive system ensures crankcases and lubricating oil lines are kept free of deposits. The combination of detergency and excellent oxidation stability provides clean piston cooling galleries and chambers.</p>	<p>Protects bearings from corrosive wear Level of alkalinity reserve ensures that acidic combustion products (which enter the crankcase due to leaks in the connecting rod seals) are effectively neutralised to protect bearings and bright metals against corrosive wear.</p> <p>Easy oil purification Combination of highly refined basestocks and special detergent additive system provides excellent water tolerance and separation properties which enable efficient purifier operation. Therefore, water washing is neither necessary nor recommended.</p> <p>PERFORMANCE STANDARDS Veritas 800 Marine meets the Wärtsilä, MAN Diesel and Mitsubishi crosshead engine system oil requirements.</p> <p>SERVICE CONSIDERATIONS Marine system oils are designed for use with active purification systems. As such systems continuously remove contaminants from the oil, long service lives are possible and it is not usual to change out the lubricant on a fixed schedule. Accordingly, it is important that the oil's condition be monitored and the change-out period be determined by means of regular oil analysis and interpretation in accordance with manufacturers' guidelines.</p> <p>While Veritas 800 Marine has excellent water separation properties, water washing is neither necessary nor recommended. However, contamination with other engine oils may drastically affect its ability to maintain these excellent water separation characteristics.</p>

MARINE CROSSHEAD ENGINE OILS

Typical Characteristics

Product	SAE Grade	CODE	Density @ 15 °C kg/L	BN mgKOH/g D2896	Sulfated Ash %m	Pour Point °C	Flash Point °C *	Viscosity cSt @		VI
								40 °C	100 °C	
Taro Special HT 70	50	2873	0.93	70	9.0	-15	>230	220	20.0	105
Taro Special HT LS 40	50	3003	0.92	40	5.1	-15	>250	247	21.0	100
Veritas 800 Marine	30	1388	0.89	5.4	0.7	-9	>220	108	11.9	95

* Cleveland Open Cup Flashpoint

<p>Delo® 1000 Marine SAE 30,40 1294, 1295</p> <p><i>Marine & Stationary Diesel Engine Oil</i></p> <p>DESCRIPTION A lower alkaline reserve (12 Base Number) trunk piston engine oil (TPEO), designed for use in medium-speed trunk piston engines burning distillate fuels with sulfur content up to 1.5% in marine or stationary service.</p> <p>Pack size: 205L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Medium-speed trunk piston engines in stationary power generation. • Medium-speed trunk piston engines in marine service. • Engine reduction gears 	<p>BENEFITS</p> <p>Maintains power output The detergent/dispersant additive system provides control of high temperature deposits in areas such as the undercrown of the piston and the piston ring belt area, enabling piston rings to function efficiently.</p> <p>Prolongs oil life Base Number (BN) level and superior alkalinity retention characteristics maintain sufficiently high BN under all service conditions to ensure corrosive acids formed by the combustion of fuel sulfur are effectively neutralised, thereby minimising liner wear.</p> <p>Efficient purifying system performance Excellent water separation characteristics enable water to be centrifuged out with essentially no loss of additive.</p> <p>PERFORMANCE STANDARDS Approved by major manufacturers for use in their medium-speed engines</p>
<p>Taro® 20 DP SAE 30,40 2737, 2734</p> <p><i>Marine & Stationary Diesel Engine Oil</i></p> <p>DESCRIPTION Medium alkaline reserve (20 Base Number) trunk piston engine oil (TPEO) designed for use in high specific output medium-speed trunk piston engines burning lower sulfur content heavy residual fuels or marine diesel fuel. Particularly suited to high load factor operations in marine or stationary service and where heavy fuels with high asphaltene content (such as those containing visbroken residues) are used.</p> <p>Pack size: 205L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Medium-speed trunk piston engines including latest designs in stationary power generation, especially in high load factor operations. • Medium-speed trunk piston engines in marine service. 	<p>BENEFITS</p> <p>Wear Protection High alkalinity levels control cylinder liner wear effectively and protect bearings from corrosion. High-performance antiwear additives provide excellent protection against adhesive wear for cams, camshaft and bearings. Taro 20 DP also provides a high degree of water tolerance and antifoam protection.</p> <p>Detergent-Dispersant Properties Keeps crankcase and oil control rings clean. Prevents deposit formation throughout the engine. Reduces lube oil filter blockage. Effectively handles insolubles.</p> <p>Oxidation Stability Oxidation inhibitors protect the oil against thermal stresses, protect engine parts from corrosion and reduce undercrown deposits while promoting extended lubricant life.</p> <p>Rust Prevention Prevents corrosion of engine parts when engine is not in operation.</p> <p>Balanced Additive Combination Provides minimum maintenance and downtime, long engine life and economical operation.</p> <p>PERFORMANCE STANDARDS Approved by major manufacturers for use in their medium-speed engines</p>
<p>Taro® 30 DP SAE 30,40 2739, 2738</p> <p><i>Marine & Stationary Diesel Engine Oil</i></p> <p>DESCRIPTION Moderately high alkaline reserve (30 Base Number) trunk piston engine oil (TPEO) designed for use in high specific output medium-speed trunk piston engines burning residual fuels (up to 4.0% sulfur). Particularly suited to high load factor operations in marine or stationary service and where heavy residual fuels with high asphaltene content (visbroken residue) are used.</p> <p>Pack size: 205L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Medium-speed trunk piston engines including latest designs in stationary power generation, especially in high load factor operations. • Medium-speed trunk piston engines in marine service. 	<p>BENEFITS</p> <p>Wear Protection High alkalinity levels control cylinder liner wear effectively and protect bearings from corrosion. High-performance antiwear additives provide excellent protection against adhesive wear for cams, camshaft and bearings. Taro 30 DP also provides a high degree of water tolerance and antifoam protection.</p> <p>Detergent-Dispersant Properties Keeps crankcase and oil control rings clean. Prevents deposit formation throughout the engine. Reduces lube oil filter blockage. Effectively handles insolubles.</p> <p>Oxidation Stability Oxidation inhibitors protect the oil against thermal stresses, protect engine parts from corrosion and reduce undercrown deposits while promoting extended lubricant life.</p> <p>Rust Prevention Prevents corrosion of engine parts when engine is not in operation.</p> <p>Balanced Additive Combination Provides minimum maintenance and downtime, long engine life and economical operation.</p> <p>PERFORMANCE STANDARDS Approved by major manufacturers for use in their medium-speed engines</p>

MARINE TRUNK PISTON ENGINE OILS

Taro® 40 XL SAE 40

2735

Marine & Stationary Diesel Engine Oil

DESCRIPTION

High alkaline reserve (40 Base Number) trunk piston engine oil (TPEO) designed for use in high specific output medium-speed trunk piston engines burning high sulfur residual fuels (over 4.5% sulfur). Particularly suited to high load factor operations in marine or stationary service and where heavy residual fuels with high asphaltene content (visbroken residue) are used.

Pack size: 205L.

APPLICATIONS

- Medium-speed trunk piston engines including latest designs in stationary power generation, especially in high load factor operations
- Medium-speed trunk piston engines in marine service

BENEFITS

Wear Protection

High alkalinity levels control cylinder liner wear effectively and protect bearings from corrosion. High-performance antiwear additives provide excellent protection against adhesive wear for cams, camshaft and bearings. Taro 40 XL also provides a high degree of water tolerance and antifoam protection.

Detergent-Dispersant Properties

Keeps crankcase and oil control rings clean. Prevents deposit formation throughout the engine. Reduces lube oil filter blockage. Effectively handles insolubles.

Oxidation Stability

Oxidation inhibitors protect the oil against thermal stresses, protect engine parts from corrosion and reduce undercrown deposits while promoting extended lubricant life.

Rust Prevention

Prevents corrosion of engine parts when engine is not in operation.

Balanced Additive Combination

Provides minimum maintenance and downtime, long engine life and economical operation..

PERFORMANCE STANDARDS

Approved by major manufacturers for use in their medium-speed engines Listed by Caterpillar for 3600 Series engines exceeding 85% load factor (HFO)

Taro® 50 XL SAE 40

2736

Marine & Stationary Diesel Engine Oil

DESCRIPTION

A very high alkaline reserve (50 Base Number) trunk piston engine oil (TPEO) specifically designed for use in the newer generation, high specific output medium-speed trunk piston engines fitted with antipolishing rings burning high sulfur residual fuels (up to 4.5% sulfur). Particularly suited to high load factor operations in marine or stationary service and where heavy residual fuels with high asphaltene content (visbroken residue) are used.

Pack size: 205L.

APPLICATIONS

- Large medium-speed trunk piston engines fitted with anti-polishing rings.
- Medium-speed trunk piston engines including latest designs in stationary power generation, especially in high load factor operations.
- Medium-speed trunk piston engines in marine service.

BENEFITS

Wear Protection

High alkalinity levels control cylinder liner wear effectively and protect bearings from corrosion. High-performance antiwear additives provide excellent protection against adhesive wear for cams, camshaft and bearings. Taro 50 XL also provides a high degree of water tolerance and antifoam protection.

Detergent-Dispersant Properties

Keeps crankcase and oil control rings clean. Prevents deposit formation throughout the engine. Reduces lube oil filter blockage. Effectively handles insolubles.

Oxidation Stability

Oxidation inhibitors protect the oil against thermal stresses, protect engine parts from corrosion and reduce undercrown deposits while promoting extended lubricant life.

Rust Prevention

Prevents corrosion of engine parts when engine is not in operation.

Balanced Additive Combination

Provides minimum maintenance and downtime, long engine life and economical operation.

PERFORMANCE STANDARDS

Approved by major manufacturers for use in their medium-speed engines.

Typical Characteristics

Product	SAE Grade	CODE	Density @ 15 °C kg/L	BN mgKOH/g D2896	Sulfated Ash %m	Pour Point °C	Flash Point °C *	Viscosity cSt @		VI
								40 °C	100 °C	
Delo 1000 Marine 30	30	1294	0.893	12	1.6	-21	>220	96	11.0	99
Delo 1000 Marine 40	40	1295	0.898	12	1.6	-18	>220	137	14.0	99
Taro 20 DP 30	30	2737	0.897	20	2.5	-12	>220	97.5	11.0	98
Taro 20 DP 40	40	2734	0.904	20	2.5	-15	>230	139	14.0	97
Taro 30 DP 30	30	2739	0.901	30	3.6	-18	>220	96.8	11.1	100
Taro 30 DP 40	40	2738	0.906	30	3.6	-18	>230	139	14.0	97
Taro 40 XL 40	40	2735	0.911	40	4.8	-18	>230	139	14.0	97
Taro 50 XL 40	40	2736	0.918	51	6.1	-18	>230	126	14.0	109

* Cleveland Open Cup Flashpoint

RAILROAD ENGINE OILS

Delo® 6130 CFO SAE 40, 20W-40

2982, 2852

13 Base Number, Chlorine-Free, Railroad Diesel Engine Oil

DESCRIPTION

Premium performance, 13 Base Number, "zinc-free", LMOA Generation 5 diesel engine oil, with chlorine-free additive technology, for use in railroad-type diesel engines, particularly modern higher output, lower oil consumption designs. Delo 6130 CFO, when compared with Generation 4 oils, has significantly enhanced dispersancy and oxidation resistance.

Pack size: 205L.

APPLICATIONS

- Medium speed, two and four-cycle railroad-type diesel engines, including the most recent high-output, low oil consumption designs, whether in railroad, stationary or marine service.
- Electro-Motive Diesel (EMD) 567, 645 and 710 (two-cycle) and 265H (four-cycle) railroad diesel engines in railroad, marine and stationary power-plant service.
- General Electric (GE) 7FDL, 7HDL and GEVO railroad diesel engines in railroad, marine and stationary power-plant service.

Not suitable for use in marine-type engines equipped with active purification systems.

Service considerations

Due to the higher level of dispersancy of Delo 6130 CFO, it is not suitable for use in engines which are equipped with active purification systems. In these, marine trunk piston engine oils (TPEOs) such as Delo 1000 Marine should be used.

BENEFITS

Reduces maintenance costs

High alkaline reserve ensures that corrosive acids formed by the combustion of fuel sulfur are effectively neutralised, thereby minimising corrosive wear without causing valve distress due to "guttering". The special "zinc-free", ashless anti-wear additive system protects components from adhesive wear, and guards against attack of silver plated bearings.

Maintains high power output

Superior thermal and oxidation stability assist the detergent/dispersant additive system in providing excellent control of high temperature deposits in areas such as the undercrown of the piston and piston ring belt area, enabling piston rings to function efficiently.

Prolongs oil change-out periods

Superior alkalinity retention characteristics maintain sufficiently high Base Number (BN) under all service conditions to ensure corrosive acids formed by the combustion of fuel sulfur are effectively neutralised. Reduces fuel consumption. SAE 20W-40 multigrade provides reduced fuel and oil consumption compared with SAE 40 monograde.

Prolongs service intervals

Improved oxidation stability when compared with LMOA Generation 4 oils, allows the retention of standard service intervals with today's high specific output and lower specific oil consumption engines.

PERFORMANCE STANDARDS

EMD	Worthy of Full-Scale Field Test
General Electric	Fundamental Approval
LMOA	Generation 5
API	CF
API	CF-2 (SAE 40)

Typical Characteristics

Product	SAE Grade	CODE	Density @ 15 °C kg/L	BN mgKOH/g D2896	Sulfated Ash %m	Pour Point °C	Flash Point °C *	Viscosity cSt @		VI
								40 °C	100 °C	
Delo 6130 CFO 40	40	2982	0.897	13	1.5	-15	>220	144	14.7	101
Delo 6130 CFO 20W-40	20W-40	2852	0.893	13	1.5	-15	>220	132	15.0	116

* Cleveland Open Cup Flashpoint

RAILROAD SPECIALTY GREASES AND LUBRICANTS

<p>Grease 904 1066</p> <p><i>Railroad Specialty Grease</i></p> <p>DESCRIPTION Smooth, black railroad track grease designed to reduce friction and wear between curved steel rails and railcar wheels. Contains a water-stabilised calcium thickener and 12 m% graphite. It resists water washing and has good antiwear properties. It is an NLGI grade 1 consistency and blue-black in appearance.</p> <p>Pack size: 20kg.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Trackside (wayside) lubricators for curved rail sections. Generally applied by an automatic lubricator located at the side of the rail such that the wheel flange picks up the grease and spreads it on the side of the rail. Feeds easily through automatic lubricators and has good "carry" on long curves to ensure against metal-to-metal contact. This assists in reducing wear on locomotive and rail-car wheels, as well as the rail itself, and greatly reduces the noise generally associated with curved rail layouts. • Industrial applications requiring a water-resistant, high graphite content grease of this consistency and oil viscosity (such as worm, pinion and spur gear drives of stokers and for air brake cylinders), and where temperatures do not exceed 80 °C. 	<ul style="list-style-type: none"> • Construction equipment where grease of this consistency and oil viscosity is recommended. • Automotive applications where a graphite grease is required such as brake cables, springs, door handles and locks. <p>Usable temperature range in continuous service is -25 to 80 °C.</p> <p>BENEFITS</p> <p>Saves on maintenance High level of solid graphite lubricant protects rails and wheel flanges from wear.</p> <p>Controls running costs Pumps easily and is readily spread along the side of the rail by the wheel flanges to provide economical coverage. Superior water resistance ensures continuing effective lubrication.</p> <p>Reduces noise Excellent lubricity characteristics of solid graphite minimises noisy metal-to-metal contact between curved rails and rolling wheel flanges.</p> <p>PERFORMANCE CHARACTERISTICS Suitable for use in track lubricators manufactured by Portec Ltd (P&M) and Exors of James Mills Ltd (Hurcol).</p>
<p>Journaltex HD-C 1321</p> <p><i>Journal Bearing Oil</i></p> <p>DESCRIPTION A premium quality, rust inhibited railroad journal bearing oil. Assists in breaking-in new bearings and reduces friction in heavily loaded bearings. ISO Grade: 150.</p> <p>Pack size: 205L.</p>	<p>APPLICATIONS</p> <ul style="list-style-type: none"> • Recommended for lubricator pad, waste saturation or free oiling of railway journal bearings. • Also suitable for diesel-electric locomotive traction motor suspension bearings and oil lubricated roller bearings. <p>BENEFITS Reduces Friction. Minimises downtime.</p>
<p>TM Gear Lube Premium 1075</p> <p><i>Traction Motor Gear Lubricant</i></p> <p>DESCRIPTION Black, adhesive, semi-fluid grease specifically designed for lubrication of traction motor gear cases of diesel-electric locomotives. Contains a lithium thickener, very high viscosity base fluid and special EP additive system</p> <p>Pack sizes: 450g bag.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Traction motor gear cases (incorporating appropriate seal designs) where semi-fluid grease-type lubricants are specified. • Older non-sealed traction motor designs that normally use heavy residual-type gear lubricants, where the higher leakage rate that may result is acceptable. • Slow to medium speed industrial gear applications where an EP semi-fluid grease is recommended 	<p>BENEFITS</p> <p>Minimises downtime High film strength and EP additive package protects heavily loaded gears from wear and scuffing. Good low temperature fluidity ensures that effective lubrication is maintained under cold start-up conditions.</p> <p>Long service life Excellent oxidation resistance minimises thickening in high temperature service, while high base oil viscosity and adhesiveness reduce the tendency to leak from the gear case.</p> <p>Enhanced equipment protection Effective corrosion inhibitors protect gear components from rusting in wet conditions.</p> <p>PERFORMANCE STANDARDS General Motors EMD Specification EMS 1045.</p>

<p>Torque Fluid 32 1358</p> <p><i>Specialty Transmission Fluid</i></p> <p>DESCRIPTION Specialty power transmission fluid approved for use in Voith variable speed turbo-couplings and hydrodynamic brakes.</p> <p>Pack size: 205L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Voith turbo-couplings in industrial applications such as circulating pumps, fans, blowers, compressors, crushing machines, mixers, agitators, centrifuges and belt-conveyor drives. • Voith turbo-couplings in marine and railroad equipment. • Voith torque converter transmissions in shunting locomotives and heavy construction equipment. • Voith hydrodynamic brakes in railroad and heavy-duty automotive equipment. <p>BENEFITS Extended turbo-coupling life Ashless dispersant additive system is very effective in keeping all turbo-coupling parts clean and free from sludge. The corrosion inhibitor system protects copper, copper alloy and ferrous metal components, and prevents rusting due to moisture from condensation.</p>	<p>Efficient operation for extended periods Highly refined base oil and oxidation inhibitor system resist the formation of varnish deposits on hydraulic mechanisms and turbo-coupling elements. Good air release properties provide smooth and reliable operation by ensuring that entrained air is rapidly released.</p> <p>Lower maintenance Special EP agents minimise wear and scoring of bearings and other transmission components.</p> <p>Excellent all-temperature performance Extremely good low temperature fluidity and low pour point allow equipment operation under the most severe low temperature conditions. High oxidation stability prevents oil thickening, even in severe high temperature service.</p> <p>PERFORMANCE STANDARDS</p> <p>Voith Turbo Specification 3.625.6072 Approved (for turbo-couplings type S, TP, DTP, and hydrodynamic brakes type VHB)</p> <p>Voith Turbo Specification 3.625.6073 Approved (for variable speed turbo-couplings type R)</p> <p>Voith Meets requirements of Turbo Specification 3.625.6052 for mineral oils in hydrodynamic circuits</p>
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<p>Cetus® DE 100 1350</p> <p><i>Synthetic Air Compressor Oil</i></p> <p>DESCRIPTION Premium performance, synthetic compressor oil based on di-ester technology and containing an inhibitor system to give outstanding oxidation resistance and corrosion protection under severe operating conditions.</p> <p>Pack size: 20L</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Flooded screw compressors • Rotary air compressors. • Reciprocating air compressors. • General industrial applications where non-EP synthetic products with outstanding oxidation properties are required, e.g., hydraulic systems, oil mist lubrication systems, industrial gear cases. <p>Not recommended for use in breathing air compressors. Not recommended to be mixed with PAO or mineral based compressor oils.</p>	<p>BENEFITS</p> <p>Extended oil service life Oxidatively stable di-ester base fluid and inhibitor system resist oil breakdown at the elevated temperatures encountered in compressor service, permitting oil drain intervals to be extended beyond those achieved with conventional lubricants.</p> <p>Minimum maintenance and downtime Di-ester base fluid ensures an effective oil film to protect highly loaded parts against wear under high temperature operating conditions, as well as during low temperature start-up. The inhibitor system provides rust and corrosion protection under all conditions.</p> <p>Trouble-free operation in severe service Outstanding thermal and oxidation stability enable the di-ester lubricant to resist deposit formation in the heat of the compression cycle, even under the most severe service conditions.</p> <p>PERFORMANCE STANDARDS Matsubara Approval Tanabe Approval: H-series reciprocating marine compressors Meets the individual requirements of other major manufacturers of both rotary and reciprocating compressors</p>
<p>Cetus® PAO 46, 68 1632, 1633</p> <p><i>Synthetic Air Compressor Oil</i></p> <p>DESCRIPTION Premium performance, synthetic compressor oil based on polyalphaolefin technology. Contains a rust and oxidation inhibitor system plus anti-wear additives to provide outstanding oxidation resistance, corrosion protection and to minimise wear under severe operating conditions.</p> <p>Pack sizes: 208L, 20L</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Flooded screw compressors. • Rotary air compressors. • Reciprocating air compressors. • Medium-speed marine diesel engine turbochargers. <p>Not recommended for use in breathing air compressors.</p> <p>BENEFITS</p> <p>Extended oil service life Outstanding oxidation stability of the polyalphaolefin base fluid and inhibitor system resists oil breakdown at the elevated temperatures encountered in compressor service, permitting oil drain intervals to be extended beyond those achieved with conventional lubricants.</p>	<p>Minimum maintenance and downtime Polyalphaolefin base fluid ensures an effective oil film to protect highly loaded parts against wear under high temperature operating conditions, as well as during low temperature start-up. Effective inhibitor system provides excellent rust and corrosion protection under all conditions. Anti-wear additive minimises wear under severe operating conditions.</p> <p>Trouble-free operation in severe service Outstanding thermal and oxidation stability enables the polyalphaolefin lubricant to resist deposit formation in the heat of the compression cycle, even under the most severe service conditions.</p> <p>Extended range of applications High viscosity index and low pour points of the polyalphaolefin base fluid permits application in a wider range of ambient operating temperatures than with conventional lubricants.</p> <p>PERFORMANCE STANDARDS ABB Meets the requirements of ABB for use in their turbochargers Atlas Copco ECB 573 for use in GR and GR Pack screw compressors German Standard DIN 51506 VDL</p>
<p>Compressor Oil EP VDL 100, 150 3055, 3054</p> <p><i>Reciprocating Air Compressor Oil</i></p> <p>DESCRIPTION Petroleum-based compressor oil for severe operating conditions. It contains an advanced additive technology that delivers extremely stable oxidation resistance, corrosion protection, foam inhibition, and reduced deposit formation on pistons and valves through the use of superior EP technology.</p> <p>Pack size: 20L. ISO 100 also available in 205L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Single-stage and multi-stage reciprocating and centrifugal compressors, and oil flooded screw compressors operating at high pressures of up to 1000 bar and high temperatures.. • Reciprocating compressors where the manufacturer specifies DIN 51506 VDL oil. • Air or inert gas reciprocating compressors. • Stationary, semi-portable and portable units. • Compressors where the manufacturer specifies a non-detergent, EP oil. • Compression chamber and running gear of drip-feed rotary compressors (as appropriate). <p>Not recommended for use in breathing air compressors.</p>	<p>BENEFITS</p> <p>Saves on maintenance and downtime Excellent oxidation stability and low carbon-forming tendency of the highly refined base oil and special inhibitor system reduces the build-up of harmful deposits on critical areas such as discharge valves, maintaining compressor performance under the severest operating conditions. The highly effective film forming corrosion inhibitor plates out on metal surfaces to protect against rust caused by moisture entering the system, particularly during shutdown and intermittent operation.</p> <p>Long oil service life High oxidation stability also resists oil breakdown at high discharge temperatures in compressor crankcase applications, permitting long oil drain intervals.</p> <p>Trouble-free operation Effective anti-foam properties of the highly refined base oil and inhibitor system protect against the interruption of lubrication due to entrained air, and minimise the possibility of foaming and overflow in tanks and reservoirs.</p> <p>PERFORMANCE STANDARDS German Standard DIN 51506 Group VDL Recommended for use in Teikoku Machinery air compressors Tanabe and Sperre reciprocating type compressors, Hatlapa V-Line piston type compressors, Hamworthy vertical compressors</p>

Rando® HD 32, 46, 68, 100 2048, 2050, 2051, 2044

Anti-Wear Hydraulic Fluid

DESCRIPTION

High quality, anti-wear, hydraulic and lubricating oils fully inhibited against oxidation, rusting and foaming. They have good demulsibility, thermal stability and anti-foam properties. While principally hydraulic oils, these lubricants find some use in compressors.

Pack sizes: 205L, 20L. (ISO 68 also available in 4L.)

APPLICATIONS

- Rando HD 32 is recommended in airline lubricators and some modern screw and rotary vane compressors.
- Rando HD 46, 68 and 100 may be used where antiwear hydraulic oils of these viscosity grades are recommended.

Not recommended for use in breathing air compressors.

BENEFITS

Trouble-free operation

Good hydrolytic stability and water separation characteristics provide excellent filterability in the presence of water contamination. Good anti-foam and air release properties ensure smooth operation and system efficiency.

Longer equipment life

Special anti-wear additive package reduces wear by protecting surfaces when load causes breakdown of the lubricant film.

Reduced downtime

Effective rust and oxidation inhibitor system prevents the production of abrasive particles from rust formation, and deposits, varnishes and sludge from oil breakdown, which can damage equipment surfaces and seals, and block filters prematurely.

Extended oil service life

High oxidation stability resists oil thickening and deposit formation in service, eliminating the need for unscheduled change of hydraulic fluid.

PERFORMANCE STANDARDS

Cincinnati Machine	P-68 (ISO 32), P-70 (ISO 46), P-69 (ISO 68)
David Brown	Industrial Gears 0A, 1A, 2A, 3A
Denison Hydraulics	HF-0 (ISO 32, 46, 68)
German Standard	DIN 51524 Part 2, HLP
ISO	6743 Part 4, Type HM
Bosch Rexroth	RE 07 075
US Steel	126 and 127
Eaton Vickers	M-2952-S, I-286-S [industrial applications], M-2950-S [mobile applications] (ISO 32, 46, 68)
SAE	MS1004 HM

Regal® R&O 32, 46, 68, 100 1334, 1335, 1336, 1333

Industrial Turbine Oil

DESCRIPTION

Premium quality, inhibited turbine oil formulated from highly refined base stocks and special rust, oxidation and foam inhibitors. While principally turbine oils, these lubricants find some use in compressors.

Pack sizes: 205L, 20L. ISO 100 not available in 20L.

APPLICATIONS

- Centrifugal, rotary and reciprocating compressors, turbo-blowers and centrifugal pumps, requiring a rust and oxidation inhibited oil
- Steam and hydraulic turbines operating under all service conditions.
- Industrial gas turbines operating under moderate service conditions where the oil is not exposed to excessively high temperatures, or gearsets requiring enhanced load carrying performance.
- Bath and circulating systems supplying rolling element bearings of all types, lightly loaded gear sets, vacuum pumps, machine tools (including computer controlled units), conveyors, electric motors, and low to moderate pressure hydraulic pumps where anti-wear properties are not required.
- Regal R&O 46 may be used as a heat transfer fluid in open systems operating at temperatures up to 200°C and in closed systems (sealed with cold oil or inert gas) operating at bulk oil temperatures up to 320°C

Not recommended for use in breathing air compressors.

BENEFITS

Prolonged oil service life

Multi-component inhibitor system resists oil oxidation during exposure to high temperature conditions, ensuring longer service life.

Saves on maintenance and downtime

The highly refined base stocks and multi-component oxidation inhibitor system resist the formation of harmful sludge and varnish deposits. The special rust inhibitor protects components against corrosion.

Trouble-free operation

The water separability of Regal R&O allows rapid settling of harmful water accumulated from steam condensate. The non-silicone foam inhibitor allows rapid release of entrained air while minimising foam enabling reliable operation of sensitive hydraulic control devices.

Saves on inventory

The rust and oxidation inhibited formulation has multipurpose capability, simplifying oil inventories and reducing the possibility of misapplication.

PERFORMANCE STANDARDS

ANSI/AGMA	9005-E02: AGMA Lubricant Nos. 1,2,3 (ISO 46, 68, 100, respectively)
British Standard	BS 489:1999 (ISO 32 to 68)
Cincinnati Machine	P-38, P-55, P-54 (ISO 32, 46, 68, respectively)
David Brown	Table M Gear Oil Grades OM, IM, 2M, 3M (ISO 32 to 100, respectively)
German Standard	DIN 51515 Part 1

Meets the requirements of major turbine builders including Alstom (and former ABB), GE, Siemens-Westinghouse.

INDUSTRIAL AIR COMPRESSOR OILS

Typical Characteristics

Product	ISO Grade	CODE	Density @ 15 °C kg/L	Pour Point °C	Flash Point °C *	Viscosity cSt @		VI
						40 °C	100 °C	
Cetus DE 100	100	1350	0.959	-31	246	95.5	10.2	85
Cetus PAO 46	46	1632	0.842	-57	232	46	8.1	136
Cetus PAO 68	68	1633	0.850	-57	240	68	10.3	141
Compressor Oil EP VDL100	100	3055	0.89	-12	246	100	11.0	97
Compressor Oil EP VDL150	150	3054	0.89	-12	256	150	14.6	95
Rando HD 32	32	2048	0.870	-33	210	30.5	5.3	106
Rando HD 46	46	2050	0.876	-33	220	44.0	6.7	106
Rando HD 68	68	2051	0.881	-30	226	65.0	8.6	104
Rando HD 100	100	2044	0.887	-21	240	95.5	10.8	97
Regal R&O 32	32	1334	0.871	-9	212	30.6	5.3	102
Regal R&O 46	46	1335	0.874	-9	224	44.0	6.6	100
Regal R&O 68	68	1336	0.875	-9	234	65.0	8.4	98
Regal R&O 100	100	1333	0.887	-9	254	95.5	10.8	96

* Cleveland Open Cup Flashpoint

INDUSTRIAL REFRIGERATION COMPRESSOR OILS

<p>Suniso 4SA 1626 <i>Refrigeration Compressor Oil</i></p> <p>DESCRIPTION Refrigeration and air conditioning compressor oil formulated on highly refined, dewaxed naphthenic base stock, and refinery treated to enhance thermal stability.</p> <p>Pack sizes: 205L, 20L.</p> <p>APPLICATIONS Suniso 4SA is designed for systems using ammonia as refrigerant, which is immiscible with the oil. It is a modified version of Suniso 4GS developed for ammonia refrigeration systems where temperatures and pressures are frequently higher.</p> <p>Not recommended for use in breathing air compressors.</p> <p>Not designed for systems using hydrofluorocarbon refrigerants such as HFC 134a - refer Emkarate RL Series.</p> <p>BENEFITS Stability Chemical stability resists chemical reaction with refrigerant gases and metals in the refrigeration systems. Thermal stability minimises formation of carbon deposits at compressor hot spots such as valves or discharge ports. Oxidation stability reduces the formation of oxidation products.</p>	<p>Low temperature capability Low wax content prevents precipitation of waxy material at low temperature points in the system which might cause blockages. Low pour point to prevent separated oil from congealing.</p> <p>Maintenance of viscosity Maintains the correct viscosity, even when diluted with refrigerant, to ensure high film strength at the elevated compressor operating temperatures and to provide good fluidity under the coldest operating conditions.</p> <p>High Dielectric Strength High dielectric strength provides insulation in hermetic units where the oil-refrigerant mix serves as an insulator between the motor and compressor body.</p> <p>Cleanliness Free from contamination and moisture to prevent scarring of bearing surfaces, plugging of lines or oil ports and general deterioration.</p> <p>Compatibility Compatible with other mineral refrigeration oils. Note: manufacturers recommend against mixing refrigerator compressor oils and it is to be avoided if possible. Under no circumstances should mineral refrigeration oils be mixed with synthetic refrigeration oils.</p> <p>PERFORMANCE STANDARDS British Standard BS 2626-1992 C Approved by the major compressor and equipment manufacturers.</p>
<p>Capella® WF 68 1291 <i>Refrigeration Compressor Oil</i></p> <p>DESCRIPTION High quality, essentially wax-free oil for the lubrication of refrigeration and air-conditioning compressors when refrigerants other than HFCs (hydrofluorocarbons) are used. Made from special, narrow-cut naphthenic base oils with an extremely low pour point and Freon floc point.</p> <p>Pack sizes: 205L, 20L</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Reciprocating and rotary refrigeration compressors. • Air conditioning systems. • Refrigeration systems using chlorofluoro-carbons (CFCs). • Refrigeration systems using ammonia, hydrochlorofluorocarbons (HCFCs), carbon dioxide, sulfur dioxide or ethylene chloride. <p>Not for use in systems containing HFC refrigerants such as HFC 134a (refer Emkarate RL series).</p> <p>Not recommended for use in breathing air compressors.</p>	<p>BENEFITS Reduced downtime Low pour point and Freon floc point prevents loss of fluidity or formation of wax deposits, ensuring efficient evaporator operation, and cleanliness of equipment lines and refrigerant control devices. Excellent lubricity guards against wear of compressor components.</p> <p>Prolonged compressor and seal life Thermal stability minimises formation of gum, varnish and sludge deposits.</p> <p>Prolonged oil service life Excellent oxidation resistance reduces oil thickening and deposit formation, ensuring extended oil change intervals.</p> <p>Reduced costs Suitability for use with a wide range of refrigerants minimises inventory and reduces chance of misapplication.</p> <p>PERFORMANCE STANDARDS British Standard BS 2626:1992, Type A Lubricants ABB Stal Refrigeration AB APV – Baker Bitzer Kuhlmaschinenbau Bock Gram</p> <p>Grasso Linde McQuay Sabroe Sullair Technofrigo Dell'Osto York</p>

Typical Characteristics

Product	ISO Grade	CODE	Density @ 15 °C kg/L	Pour Point °C	Flash Point °C *	Viscosity cSt @		VI
						40 °C	100 °C	
Suniso 4SA	'54'	1626	0.897	-33	210	54	7.0	68
Capella WF 68	68	1291	0.902	-30	198	65	6.7	24

* Cleveland Open Cup Flashpoint

White Oil Pharma 15, 68

1719, 1720

Pharmaceutical White Oil

DESCRIPTION

Premium quality, colourless, odourless, tasteless white oil, containing a food-grade inhibitor and meeting the purity standards and requirements of international and national authorities for pharmaceutical white oils.

Pack sizes: 205L, 20L.

APPLICATIONS

Medicinal and cosmetic applications:

- Manufacture of ointments, complexion creams, hair care products, laxatives, baby oils, and as a carrier for the preparation of curative drugs.

Food processing and packaging operations where oil used as a processing aid may be included in food or food packaging material, or direct contact between the oil and food or packaging materials may occur:

- Egg processing, meat and fish packaging, fruit and vegetable processing, dairy industry, brewing and bottling, food canning, sugar refining, and the manufacture of paper intended for food packaging.
- Hydraulic fluid, or bearing and gear lubricant.
- Compressors (ISO 68) handling air or gases (except oxygen), or carbon dioxide for carbonated beverages.
- Rust preventive for vats, tanks and machinery.

General industry applications:

- Plasticiser for hydrocarbon resins, process oil where extremely low sulfur content is required, textile industry lubricant, organic synthesis, animal husbandry, etc.
- Compressors in refrigeration systems handling methyl chloride or sulfur dioxide.

Not recommended for use in breathing air compressors.

BENEFITS

Exceeds international quality standards

Compliance with U.S. FDA and major national Pharmacopeia requirements ensures that the product meets the highest standards of purity for all medicinal and cosmetic applications, (even where ingestion by humans and animals is involved), and also for food processing and packaging operations.

Trouble-free operation

In general industrial applications, the U.S. FDA approved inhibitor enhances oxidation stability to resist the formation of gum and sludge deposits, and corrosive acidic by-products. Good lubricity of the highly refined white oil protects against wear, while good miscibility characteristics overcome potential problems in mixing with other petroleum oils, most animal or vegetable fats or oils, and waxes.

Prolonged service and shelf life

U.S. FDA approved inhibitor resists oxidation and resultant oil breakdown in service, and oil darkening in storage.

PERFORMANCE STANDARDS

Australia Department of Primary Industries and Energy, Australian Quarantine & Inspection Service: Approved Lubricant Type A

Germany Deutsches Arzneibuch (DAB)

UK British Pharmacopoeia (BP)

USA U.S. FDA CFR 178.3620(a), CFR 178.3570, CFR 172.878, CFR 573.680

U.S. Pharmacopeia (USP) (ISO 68)

U.S. National Formulary (NF) (ISO 15)

Many other national Pharmacopeia

PROPERTIES

ISO Grade	15	68
Colour, Saybolt	+30	+30
Density, kg/L @ 25 °C	0.850	0.880
Flashpoint, PMCC, °C	188	230
Viscosity, mm ² /s, 40 °C	15.0	68.0

Food Machinery Grease

1086

Food Machinery Grease

DESCRIPTION

Multipurpose, extreme pressure, premium quality NLGI No. 2 grease for lubrication of food machinery and canning equipment, especially where incidental contact with food may occur. Pure white, odourless and tasteless. Manufactured from pharmacopoeia grade white mineral oil with a special aluminium complex thickener and contains rust and oxidation inhibitors and extreme pressure additives. All ingredients meet Section 178-3570 of the US Food and Drug Administration regulations and it is approved by AQIS as a Lubricant Type A - for use wherever food or food products may be subject to incidental contact with the lubricant.

Pack sizes: 20kg.

APPLICATIONS

- Machinery and equipment used in producing, manufacturing, packaging, processing, preparing, treating, transporting or holding food.
 - Plain and anti-friction bearings, slides, guides and other moving parts.
- Usable temperature range in continuous service is -30 to 160 °C.
Maximum temperature for short term exposure is 210 °C.

BENEFITS

No effect on food

Should incidental food contact occur, the grease will not affect the colour, odour or taste of the food product.

Protects Equipment

Protects against rust and corrosion, especially bearings and other moving parts subjected to wet conditions (high humidity, water washing, steam, etc). It also protects during machine downtime. Resists water washout and provides a seal against the entrance of water, and fruit and vegetable juices into bearings.

Rationalisation

Offers the safety and convenience of serving all grease points in the plant due to its high load carrying capacity and multipurpose characteristics. May be used in equipment not associated with food and as such represents an excellent grease for rationalisation.

High mechanical and chemical stability

Compatible with and maintains its consistency in the presence of beverages and food juices. Resists oxidation and has high chemical and mechanical stability. Shear stable and maintains consistency when worked in bearings.

PERFORMANCE STANDARDS

USA USFDA: Approved Type H-1 Grease. Ingredients meet requirements of Section 178-3570
US Dept of Agriculture: Accepted for inspected meat and poultry processing plants.

Australia Department of Primary Industries and Energy, Australian Quarantine & Inspection Service: Approved Lubricant Type A

Snow White Petroleum Jelly

1099

White Petrolatum

DESCRIPTION

A highly purified white petrolatum.

Pack sizes: 175kg, 20kg, 2.5kg.

APPLICATIONS

- Used in leather finishes.
- Softening agent for printing inks.
- Plasticiser for rubber.
- Component of carbon paper.
- A variety of processes and applications where petrolatum characteristics are required.
- Protection of battery terminals and certain military ordnance stores such as torpedoes and torpedo mechanisms.
- May be used for the same applications as DEF-2333 (UK, Australian and New Zealand Defence Standards), although it does not necessarily meet the specification requirements.

BENEFITS

Easy application and removal

It is applied by brushing or smearing, and removed by wiping or by solvents such as kerosene or white spirit (Stoddard solvent).

Non-staining

The purity and chemical inertness of the product reduce staining.

PROPERTIES

Density at 60 °C, kg/L	0.846
Melting Point, °C	65
Acidity/Alkalinity	neutral to litmus
Sulfated Ash, %m	0.05
Congeaing Point, °C	63
Consistency at 25 °C, (USP 1985)	160
Viscosity, cSt at 100 °C	10.7
UV Absorbance at 290 nm	0.08

RPM Borate® EP Lubricant

Extreme Pressure Gear Oil

ISO Grade	68	150	220	320	460	680	1200
Product Code	1344	1340	1341	1342	1343	1345	1339

DESCRIPTION

Industrial EP gear lubricant. Also suitable for automotive applications. Contains a patented Borate EP additive system and supplemental anti-wear agent to provide wear protection superior to conventional EP gear lubricants. Also contains oxidation, corrosion and foam inhibitors. A "problem solver" for severe gear lubrication applications.

Pack sizes: 205L, 20L. ISO 1200 is available only in 205L. ISO 68 and 680 not available in 205L.

APPLICATIONS

- Industrial enclosed gears operating under severe conditions, including steel-on-bronze worm gears.
- Drive and reduction gearboxes on mills, mixers, crushers, extruders, kilns, stenters, pumps and hoists.
- Automotive differentials and gear cases operating under severe service conditions. Particularly for off-highway and heavy-duty trucking fleets.
- Heavy-duty transmissions where manufacturers recommend API GL-5 lubricants. May also be used in transmission applications where non-EP lubricants are normally recommended.

Not recommended where excessive water contamination is likely to occur.

BENEFITS

Reduces operating costs

Borate provides a thick, tenacious film which prevents metal-to-metal contact between sliding surfaces under severe conditions. The physical, rather than chemical, EP action of Borate minimises corrosion of ferrous and copper-alloy components, even under high temperature conditions. Equipment maintenance is minimised and downtime is reduced.

Maximises oil drain intervals

Thermal and oxidation stability reduces oil degradation, prolonging lubricant life.

Saves on fuel and power

Reduced friction of the Borate additive and its high load-carrying ability in lower viscosity grades frequently permit use of a lower viscosity grade than conventional gear oils. This results in reduced power loss, giving fuel savings in automotive applications and reduced power consumption in industrial applications.

Reduces inventory costs

Ability to replace non-EP transmission lubricants can allow a single oil to be used in both transmissions and differentials, with reductions in lubricant inventory.

PERFORMANCE STANDARDS

API	GL-5, GL-4 and GL-2
U.S. Military	MIL-L-2105D (SAE 80W-90, ISO 150)
David Brown	Table E Approved: 2E (ISO 68), 4E to 7E (ISO 150 to 460)

Meropa®

Extreme Pressure Industrial Gear Oil

ISO Grade	68	150	220	320	460	680
Product Code	1234	1229	1230	1231	1233	1235

ISO Grade	1000	4000
Product Code	1228	2702

DESCRIPTION

High performance, mild EP, industrial gear lubricant formulated with a sulfur-phosphorus additive system, which also provides rust and oxidation inhibition, a corrosion and oxidation inhibitor and a metal passivator. Designed primarily for industrial gear lubrication services where loads and shock loadings are high.

Pack sizes: 205L, 20L. ISO 68, 680 and 4000 are available only in 205L.

APPLICATIONS

- Enclosed industrial gear drives.
- Open gear drives (heavy grades).
- Spur, bevel, helical, worm and industrial hypoid gear cases.
- Industrial type reduction gearboxes on mining equipment, cement mills, ball and rolling mills, crushers, conveyors, kilns, winches, machine tools and marine equipment.
- Chain drives, sprockets, slide guides and flexible couplings.
- Plain and rolling element bearings.
- For bath, splash, circulation or spray lubrication, as applicable to the grade.

BENEFITS

Maintains gear set efficiencies

High thermal stability EP system maintains clean gear and bearing surfaces, minimising deposits which interfere with effective lubrication. High oxidation stability limits in-service viscosity increases, which lead to energy losses.

Extends equipment life

Extremely effective EP system forms a protective film in areas of metal-to-metal contact, minimising wear rates and maintaining efficient transfer of power. Good water separation and effective rust inhibitors protect surfaces against rust and corrosion. High thermal stability additive system reduces the formation of high temperature compounds which can be corrosive to bearing materials. The effective corrosion inhibitor provides additional protection for metal components.

Long oil life

Effective oxidation inhibitors and copper passivator minimise oil oxidation, limiting viscosity increase and extending oil drain intervals.

PERFORMANCE STANDARDS

ANSI/AGMA	9005-E02 2EP (ISO 68), 4EP to 8EP (ISO 150 to 680 respectively)
U.S. Steel	224 (Grades 68 to 320)
David Brown	Table E, approved: 2E (ISO 68), 4E to 8E (ISO 150 to 680 respectively)
Germany	DIN 51517 Part 3 CLP (Grades 68 to 680)

INDUSTRIAL GEAR OILS...Mineral

Crater® 2, 5

1060, 1062

Industrial Open Gear, Chain & Wire Rope Lubricant

DESCRIPTION

Black, adhesive, residual oil based lubricant industrial applications where low cost, heavy lubricating oil is required.

Pack sizes: 180kg, 450g bag.

APPLICATIONS

- Open gears (e.g., mining, quarrying, construction and dredging equipment)
- Chains and sprockets.
- Wire ropes.
- Flexible couplings.
- Sliding surfaces (e.g., drag lines and shovels).
- Enclosed gears and traction motor gearcases (where leakage is excessive with conventional lubricants).

Note: Thinning with an appropriate safe solvent may improve ease of application.

BENEFITS

Wear protection under adverse conditions

High load carrying capacity and adhesive properties of the residual base fluid ensures a tough, durable lubricating film is maintained on exposed gears and surfaces.

Good rust protection

Tenacious lubricant coating protects exposed metal surfaces against the elements.

Quiet operation of gears

Cohesive lubricant coating remains pliable and effectively cushions gears and contacting surfaces.

Typical Characteristics

Product	ISO Grade	CODE	Density @ 15 °C kg/L	Pour Point °C	Flash Point °C *	Viscosity cSt @		VI	Timken OK Load kg	FZG Pass Stage
						40 °C	100 °C			
RPM Borate EP Lube 68	68	1344	0.901	-33	> 190	65	8.6	103	43	12+
RPM Borate EP Lube 150	150	1340	0.910	-30	> 190	143	14.6	101	36	12+
RPM Borate EP Lube 220	220	1341	0.913	-21	> 190	210	18.8	100	36	12+
RPM Borate EP Lube 320	320	1342	0.917	-18	> 200	306	23.8	98	32	12+
RPM Borate EP Lube 460	460	1343	0.922	-18	> 200	440	30	97	32	12+
RPM Borate EP Lube 680	680	1345	0.936	-9	> 200	660	40	99	-	12+
RPM Borate EP Lube 1200	-	1339	0.952	-6	> 220	1150	53	92	-	12+
Meropa 68	68	1234	0.886	-15	200	68	8.8	101	31.8	12
Meropa 150	150	1229	0.897	-15	215	150	14.9	99	31.8	12
Meropa 220	220	1230	0.901	-15	215	220	19.2	98	34.0	12
Meropa 320	320	1231	0.903	-15	215	320	24.3	97	34.0	12
Meropa 460	460	1233	0.906	-15	285	439	29.8	96	34.0	12
Meropa 680	680	1235	0.917	-12	285	650	36.5	91	34.0	12
Meropa 1000	1000	1228	0.933	-3	285	955	44	85	34.0	12
Meropa 4000	-	2702	0.958	-6	285	3940	108	85	-	-
Crater 2	-	1060	0.988	36	284	-	395	-	18	-
Crater 5	-	1062	1.004	-	290	-	1015	-	22	-

* Cleveland Open Cup Flashpoint

Meropa® Synthetic EP 220, 320

3000, 3001

Synthetic Extreme Pressure Industrial Gear Oil

DESCRIPTION

Premium performance, synthetic EP gear oil and circulating oil designed for use in a wide range of industrial equipment operating under severe conditions, such as heavy and/or shock loading and elevated temperatures, where short service life with conventional lubricants can be expected. Formulated with a combination of poly-alpha-olefin and synthetic ester base fluids and selected additives to provide outstanding EP performance and wear protection, increased thermal/oxidation stability and protection against corrosion and rust.

Pack sizes: 208L, 20L.

APPLICATIONS

- All types of gear systems in mobile and stationary industrial equipment where an EP lubricant is specified, including spur, bevel and worm gears.
- Plain and anti-friction bearings subjected to heavy-duty operating conditions.
- Circulating oil systems where an EP lubricant is required.
- Outdoor machinery exposed to wide ambient temperature conditions, such as crane, hoist and winch gearboxes.
- Speed reducers, chain drives, sprockets and flexible couplings.
- Bath, splash, circulating and spray lubrication systems.

BENEFITS

Minimises unscheduled maintenance

Excellent thermal and oxidation stability provides resistance to deposit formation, maintaining a cleaner gear/circulating oil system.

Extends equipment life in severe service

Special EP additive provides protection against wear of bearing and gear surfaces during heavy-duty operation. Effective rust and corrosion inhibitors protect all system components.

Trouble-free operation

Excellent air and water separation characteristics reduce the risk of surface wear caused by loss of lubricating oil film. Compatibility with all conventional seal materials and mineral-type circulating oils eliminates operational problems if changing oil types.

Long lubricant life

Improved thermal and oxidation stability ensures longer service life under adverse conditions than is possible with conventional mineral oils.

PERFORMANCE STANDARDS

ANSI/AGMA	9005-E02 for synthetic gear lubricants 5S (ISO 220), 6S (ISO 320)
David Brown	Table H approval: 5H (ISO 220), 6H (ISO 320)
US Steel	Specification No. 224
German Standard	DIN 51517 Part 3 CLP

Synthetic Wheel Motor

2961, 2962

Lubricant EP 460, 680

Synthetic Industrial EP Gear Lubricant

DESCRIPTION

Premium performance, synthetic gear oil specially designed for use in severe duty wheel motor gear applications in off-highway haul trucks used in the mining industry. Formulated with fully synthetic base fluid and advanced additives to provide outstanding thermal and oxidation stability, excellent load carrying and antiwear performance and protection against corrosion and rust.

Pack sizes: 208L.

APPLICATIONS

- Motorised wheel drive systems used in certain off-highway haul trucks (also known as electric wheel motors or motorised wheels).
- AC and DC type electric wheel motors.
- Mine haul trucks manufactured by Komatsu, Hitachi, Liebherr and Terex where fitted with GE electric wheel motor drive systems.
- Rolling element bearings incorporated in motorised wheel drive systems.
- Other moderate and heavily loaded industrial equipment where a synthetic EP gear lubricant of this type and viscosity is required.

BENEFITS

Minimises unscheduled maintenance

Superior thermal and oxidation stability provides resistance to formation of deposits and sludge, maintaining cleanliness of gears and bearings, and prolonging life of seals.

Extends equipment life in severe service

Special EP additive system provides protection against wear of gear and bearing surfaces during heavy-duty operation. Effective corrosion inhibitors protect all system components.

Trouble-free operation

Excellent water separation characteristics reduce risk of surface wear caused by loss of oil film. Compatible with all conventional seal materials.

Extended lubricant service life

Highly stable synthetic formulation resists breakdown under severe conditions and high temperatures, ensuring longer service life than is possible with conventional mineral oils.

PERFORMANCE STANDARDS

GE	General Electric Transportation Systems (Off-Hwy) Approved for use in GE Motorised Wheels
ANSI/AGMA	9005-E02
US Steel	224

Typical Characteristics

Product	ISO Grade	CODE	Density @ 15 °C kg/L	Pour Point °C	Flash Point °C	Viscosity cSt @		VI	Timken OK Load kg	FZG Pass Stage
						40 °C	100 °C			
Meropa Synthetic EP 220	220	3000	0.856	-36	212	220	26.2	152	36	-
Meropa Synthetic EP 320	320	3001	0.859	-36	216	320	35.4	157	36	-
Synthetic Wheel Motor Lubricant EP 460	460	2961	0.913	-15	238	460	37	124	31.7	12
Synthetic Wheel Motor Lubricant EP 680	680	2962	0.916	-18	238	680	49	122	31.7	12

* Cleveland Open Cup Flashpoint

Rando® HD

Anti-Wear Hydraulic Fluid

ISO Grade	10	22	32	46
Product Code	2703	2046	2048	2050

ISO Grade	68	100	150	320
Product Code	2051	2044	2045	2049

DESCRIPTION

High quality, anti-wear hydraulic and lubricating oils fully inhibited against oxidation, rusting and foaming. They have good demulsibility, thermal stability and anti-foam properties. While principally hydraulic oils, these lubricants find some use in compressors.

Pack sizes: 205L, 20L. ISO 68 also available in 4L. ISO 10 not available in 205L. ISO 320 not available in 20L.

APPLICATIONS

- Industrial hydraulic systems.
- Hydraulics of mobile and construction equipment.
- Hydraulic systems with vane, gear or piston pumps.
- Plastic injection moulding machines.
- Machine tools.
- Enclosed gear systems.
- Industrial circulating systems.
- Rando HD 32 is recommended in airline lubricators and some modern screw and rotary vane compressors..

Not recommended for use in breathing air compressors.

BENEFITS

Longer equipment life

Special anti-wear additive package reduces wear by protecting surfaces when load causes breakdown of the lubricant film.

Reduced downtime

Effective rust and oxidation inhibitor system prevents the production of abrasive particles from rust formation, and deposits, varnishes and sludge from oil breakdown, which can damage equipment surfaces and seals, and block filters prematurely.

Trouble-free operation

Good hydrolytic stability and water separation characteristics provide excellent filterability in the presence of water contamination. Good anti-foam and air release properties ensure smooth operation and system efficiency.

Extended oil service life

High oxidation stability resists oil thickening and deposit formation in service, eliminating the need for unscheduled change of hydraulic fluid.

PERFORMANCE STANDARDS

Denison Hydraulics	HF-0 (ISO 32, 46, 68)
Eaton Vickers	M-2952-S, I-286-S [industrial applications], M-2950-S [mobile applications] (ISO 32, 46, 68)
Cincinnati Machine	P-68 (ISO 32), P-70 (ISO 46), P-69 (ISO 68)
Bosch Rexroth	RE 07 075
ISO	6743 Part 4, Type HM
German Standard	DIN 51524 Part 2, HLP
SAE	MS1004 HM
US Steel	126 and 127
David Brown	Industrial Gears 0A to 5A (ISO 32 to 220)

NOTE: Blue dyed versions of Rando HD 46 and 68 are available in bulk for greater visibility under product codes 2930 and 1679 respectively.

Rando® HDZ

Wide Temperature Range Hydraulic Fluid

ISO Grade	15	32	46	68	100
Product Code	1328	1329	1330	1331	2706

DESCRIPTION

Premium quality, shear stable, HVI, anti-wear hydraulic fluid, designed for use in hydraulic systems subjected to wide variations in ambient and operating temperatures.

Pack sizes: 205L, 20L. ISO 15 and 100 not available in 20L.

APPLICATIONS

- Industrial hydraulic systems.
- Industrial hydraulic equipment subject to wide variation in temperatures.
- Hydraulics of mobile, construction and agricultural equipment.
- Hydraulic systems with vane, gear or piston pumps.
- Fork-lift trucks (in refrigerated areas).
- Plastic injection moulding machines.
- Marine deck equipment, steering gears, bow thrusters and automatic controls.
- Numerically controlled (NC) machine tools.
- Enclosed gear systems.

BENEFITS

Wide temperature application

Shear stable, multi-viscosity characteristics reduce the risk of breakdown in high pressure/high load hydraulic systems which operate over a wide temperature range.

Longer equipment life

Anti-wear additive package reduces wear by protecting surfaces when load causes breakdown of the lubricant film.

Reduced downtime

Rust and oxidation inhibitor system prevents the production of abrasive particles from rust formation, and deposits, varnishes and sludge from oil breakdown, which can damage equipment surfaces and seals, and block filters prematurely.

Trouble-free operation

Good hydrolytic stability and water separation characteristics provide excellent filterability in the presence of water contamination. Good anti-foam and air release properties ensure smooth operation and system efficiency.

Extended oil service life

High oxidation stability resists oil thickening and deposit formation in service, eliminating the need for unscheduled change of hydraulic fluid.

PERFORMANCE STANDARDS

Denison Hydraulics	HF-0 (ISO 32, 46, 68)
Eaton Vickers	M-2952-S, I-286-S [industrial applications], M-2950-S [mobile applications] (ISO 32, 46, 68)
Cincinnati Machine	P-68 (ISO 32), P-69 (ISO 68), P-70 (ISO 46)
Bosch Rexroth	RE 07 075
ISO	6743 Part 4, Type HV
German Standard	DIN 51524 Part 3, HVLP
SAE	MS1004 HV
US Steel	126 and 127

Regal® R&O 32, 46, 68, 100 1334, 1335, 1336, 1333

Industrial Turbine Oil

DESCRIPTION

Premium quality, inhibited turbine oil formulated from highly refined base stocks and special rust, oxidation and foam inhibitors. While principally turbine oils, these lubricants find some use in compressors.

Pack sizes: 205L, 20L. ISO 100 not available in 20L.

APPLICATIONS

- Bath and circulating systems supplying rolling element bearings of all types, lightly loaded gear sets, vacuum pumps, machine tools (including computer controlled units), conveyors, electric motors, and low to moderate pressure hydraulic pumps where anti-wear properties are not required.
- Steam and hydraulic turbines operating under all service conditions.
- Industrial gas turbines operating under moderate service conditions where the oil is not exposed to excessively high temperatures, or gearsets requiring enhanced load carrying performance.
- Centrifugal, rotary and reciprocating compressors, turbo-blowers and centrifugal pumps, requiring a rust and oxidation inhibited oil.
- Regal R&O 46 may be used as a heat transfer fluid in open systems operating at temperatures up to 200°C and in closed systems (sealed with cold oil or inert gas) operating at bulk oil temperatures up to 320°C

Not recommended for use in breathing air compressors.

BENEFITS

Prolonged oil service life

Multi-component inhibitor system resists oil oxidation during exposure to high temperature conditions, ensuring longer service life.

Saves on maintenance and downtime

The highly refined base stocks and multi-component oxidation inhibitor system resist the formation of harmful sludge and varnish deposits. The special rust inhibitor protects components against corrosion.

Trouble-free operation

The water separability of Regal R&O allows rapid settling of harmful water accumulated from steam condensate. The non-silicone foam inhibitor allows rapid release of entrained air while minimising foam enabling reliable operation of sensitive hydraulic control devices.

Saves on inventory

The rust and oxidation inhibited formulation has multipurpose capability, simplifying oil inventories and reducing the possibility of misapplication.

PERFORMANCE STANDARDS

ANSI/AGMA	9005-E02: AGMA Lubricant Nos. 1,2,3 (ISO 46, 68, 100, respectively)
British Standard	BS 489:1999 (ISO 32 to 68)
Cincinnati Machine	P-38, P-55, P-54 (ISO 32, 46, 68, respectively)
David Brown	Table M Gear Oil Grades OM, IM, 2M, 3M (ISO 32 to 100, respectively)
German Standard	DIN 51515 Part 1

Meets the requirements of major turbine builders including Alstom (and former ABB), GE, Siemens-Westinghouse.

Torque Fluid 32 1358

Specialty Transmission Fluid

DESCRIPTION

Specialty power transmission fluid approved for use in Voith variable speed turbo-couplings and hydrodynamic brakes.

Pack size: 205L.

APPLICATIONS

- Voith turbo-couplings in industrial applications such as circulating pumps, fans, blowers, compressors, crushing machines, mixers, agitators, centrifuges and belt-conveyor drives.
- Voith turbo-couplings in marine and railroad equipment.
- Voith torque converter transmissions in shunting locomotives and heavy construction equipment.
- Voith hydrodynamic brakes in railroad and heavy-duty automotive equipment.

BENEFITS

Extended turbo-coupling life

Ashless dispersant additive system is very effective in keeping all turbo-coupling parts clean and free from sludge. The corrosion inhibitor system protects copper, copper alloy and ferrous metal components, and prevents rusting due to moisture from condensation.

Efficient operation for extended periods

Highly refined base oil and oxidation inhibitor system resist the formation of varnish deposits on hydraulic mechanisms and turbo-coupling elements. Good air release properties provide smooth and reliable operation by ensuring that entrained air is rapidly released.

Lower maintenance

Special EP agents minimise wear and scoring of bearings and other transmission components.

Excellent all-temperature performance

Extremely good low temperature fluidity and low pour point allow equipment operation under the most severe low temperature conditions. High oxidation stability prevents oil thickening, even in severe high temperature service.

PERFORMANCE STANDARDS

Voith	Turbo Specification 3.625.6072 Approved (for turbo-couplings type S, TP, DTP, and hydrodynamic brakes type VHB)
Voith	Turbo Specification 3.625.6073 Approved (for variable speed turbo-couplings type R)
Voith	Meets requirements of Turbo Specification 3.625.6052 for mineral oils in hydrodynamic circuits

INDUSTRIAL HYDRAULIC OILS

Typical Characteristics

Product	ISO Grade	CODE	Density @ 15 °C kg/L	Pour Point °C	Flash Point °C *	Viscosity cSt @		VI	FZG Pass Stage
						40 °C	100 °C		
Rando HD 10	10	2703	0.842	-36	150	9.9	2.7	108	10
Rando HD 22	22	2046	0.861	-36	190	21	4.2	101	10
Rando HD 32	32	2048	0.870	-33	210	30.5	5.3	106	10
Rando HD 46	46	2050	0.876	-33	220	44.0	6.7	106	10
Rando HD 68	68	2051	0.881	-30	226	65	8.6	104	10
Rando HD 100	100	2044	0.887	-21	240	95.5	10.8	97	10
Rando HD 150	150	2045	0.891	-15	250	143	14.3	97	10
Rando HD 320	320	2049	0.900	-6	277	320	23.9	95	10
Rando HDZ 15	15	1328	0.849	-42	154	16	4.0	155	10
Rando HDZ 32	32	1329	0.869	-36	210	34	6.6	154	10
Rando HDZ 46	46	1330	0.873	-33	214	44	8.0	154	10
Rando HDZ 68	68	1331	0.879	-33	220	65	10.6	153	10
Rando HDZ 100	100	2706	0.886	-27	228	100	14.6	152	10
Regal R&O 32	32	1334	0.871	-9	212	30.6	5.3	102	-
Regal R&O 46	46	1335	0.874	-9	224	44.0	6.6	100	-
Regal R&O 68	68	1336	0.875	-9	234	65.0	8.4	98	-
Regal R&O 100	100	1333	0.887	-9	254	95.5	10.8	96	-
Torque Fluid 32	32	1358	0.875	-27	210	32	5.4	102	12+

* Cleveland Open Cup Flashpoint

Timber Sealer

1101

Wax in Water Emulsion Timber Sealer

DESCRIPTION

An off-white emulsion of waxes and water formulated for use as a log end sealer. It is applied to the ends of freshly sawn logs to retard moisture release from the end grain, thus reducing splitting. Treated timber cannot be painted. Timber Sealer has a shelf life of 12 months.

Pack sizes: 180kg, 20kg.

APPLICATIONS

- Control of moisture loss from the ends of the timber.

Timber Sealer should be applied at approximately one litre per 4 m² i.e. comparable to one heavy coat of paint. However it may not be painted over after application. Timber Sealer is stable for a shelf life of 12 months. However, packages should not be exposed to temperatures near or below freezing point, as this may cause the emulsion to break, leading to separation of the wax and water components. Roll container before using contents.

BENEFITS

Increased yield

The reduced cracking yields more sound timber from each log.

Easy application

Easily applied by brushing, dipping or spraying with conventional paint spraying equipment.

Low cost

Lower cost than regular paint type materials.

Non-staining

Non staining and does not damage clothing like paint. Any splashes are readily and completely removed from clothing with a petroleum solvent.

Reduced fire hazard

Reduced fire hazard compared with the use of products containing a volatile solvent.

PROPERTIES

Density at 15 °C, kg/L	0.920
Water Content, %m	51.0
Melting Point of Wax, °C	73

Propar and Pronap

Process Oil

DESCRIPTION

A range of unadditised mineral oils, their prime uses being for other than lubrication. They are used in various manufacturing processes where they may, or may not, form a component of the finished product and where their chemical composition may be of particular importance. Sales of Pronap oils are subject to usage and occupational health and safety audit.

Pack sizes: 205L. (320 is available only in bulk).

APPLICATIONS

The applications for Pronap and Propar Oils are varied. The final means of evaluating which product is best suited for a particular application is the performance in actual practice. Even in a particular process, an oil suitable in one instance at one location may not be entirely satisfactory in another due to changes in variables such as raw material, climatic conditions, process methods and equipment. Some uses for Pronap and Propar Oils, either straight or as a component in manufacture are as follows:

Adhesives	Mould release
Agricultural sprays	Plastic extenders
Carbon Black manufacture	Plywood manufacture
Floor polish dressing	Polishes manufacture
Floor oils	Rope and cordage oils
Furniture polishing oils	Rubber manufacture
Gas holder filming	Rust preventives
Ink manufacture	Shoe polishes
Leather dressing	Upholstery manufacture
Mattress manufacture	Wood treating etc
Mineral wool manufacture	

BENEFITS

Uniform characteristics

Uniformity of physical and chemical characteristics of the series ensures satisfactory application of oils.

Wide range

Range of viscosities permits wide flexibility and use in any finished products.

Typical Characteristics

Product	ISO Grade	CODE	Density @ 15 °C kg/L	Pour Point °C	Flash Point °C *	Viscosity cSt @		VI
						40 °C	100 °C	
Propar 12	'12'	4914	0.846	-18	190	11.6	2.95	107
Propar 22	22	4916	0.859	-12	210	21.5	4.28	104
Propar 32	32	4917	0.868	-9	220	28.1	5.07	107
Propar 68	68	4919	0.879	-9	234	68.0	8.8	102
Propar 100	100	4913	0.889	-9	262	89.1	10.5	100
Propar 320	320	4931	0.900	-6	262	320	24	95
Propar 460	460	4918	0.906	-9	286	536	33.6	95
Propar 1800	'1800'	4915	0.949	-3	298	1764	62.9	83
Pronap 280	'280'	4912	0.928	-9	200	257	18.5	80

* Cleveland Open Cup Flashpoint

<p>Gernol 220X, 320X 3023, 1419</p> <p><i>Compounded Process Oil</i></p> <p>DESCRIPTION Gernol 220X and 320 X are mineral oil based machine and circulating oils containing fatty compounding to improve metal wetting and adhesion properties.</p> <p>Pack size: 220X is available only in bulk, 320X is available only in 205L.</p>	<p>APPLICATIONS</p> <ul style="list-style-type: none"> • Circulating oil systems of heavy industrial machinery which incorporate clay filters to remove high levels of contamination. • Also used in once through or high loss industrial systems. • General industrial lubrication where loads are light. <p>BENEFITS General purpose Multipurpose lubricant where loads are light, with adhesion and metal wetting properties</p>
<p>Summit AX 1623</p> <p><i>Compounded Process Oil</i></p> <p>DESCRIPTION An ISO 460 viscosity mineral oil, compounded with a fatty oil to improve lubricity in the presence of wet steam to ensure adequate lubrication and low wear rates in all types of reciprocating steam engines.</p> <p>Pack size: 205L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Steam cylinder and valve lubrication of non-condensing steam engines where the steam is wet or of low quality. It provides lubrication for the sliding surfaces of pistons, valves and piston and valve rods where they pass through glands in steam and valve chests. • Designed for saturated steam in the 700 to 1000 kPa pressure range and temperatures up to 260 °C. • Where steam is generated for purposes other than for use in engines, such as hospital boiler installations, processing plants such as canneries, etc., Summit AX may be used in lubricators fitted to boiler ancillary equipment, e.g. the lubricators fitted to the shuttle valve chests of "Weir" boiler feed water pumps. • As a worm gear lubricant in industrial gearboxes where an ISO 460 non-extreme pressure gear oil is allowable. <p>Not recommended for worm-drive differentials in automotive vehicles.</p>	<p>BENEFITS Excellent lubricity and wettability High viscosity mineral oil compounded with selected fatty oils provides high film strength and ensures oil adheres to cylinders and other sliding surfaces.</p> <p>Emulsifies readily Compounding agent gives it the ability to emulsify readily with the water in saturated steam and to resist being washed off cylinder and valve faces and thus maintain lubrication.</p> <p>Separates readily from condensate Choice and low concentration of compounding matter gives it the ability to separate readily from condensate, provided efficient filtering systems are used. This ensures boiler heating surfaces and heaters are maintained at efficient levels and are not impaired by oily deposits.</p> <p>Long service life Good oxidation and thermal stability of the refined fatty compounding material resists oil breakdown with heat.</p> <p>Improved load carrying ability The compounding matter in Summit AX improves its load carrying capacity when used as a gear lubricant, particularly in industrial worm-drive gearboxes where the action is completely sliding.</p> <p>PERFORMANCE STANDARDS ANSI / AGMA 7 Comp requirements.</p>

Typical Characteristics

Product	ISO Grade	CODE	Density @ 15 °C kg/L	Pour Point °C	Flash Point °C *	Viscosity cSt @		VI
						40 °C	100 °C	
Gernol 220X	220	3023	0.890	-3	260	220	19	97
Gernol 320X	320	1419	0.895	-3	260	320	24.1	96
Summit AX	460	1623	0.905	-6	240	430	28.5	93

* Cleveland Open Cup Flashpoint

<p>Way Lubricant X 68 1359</p> <p><i>Machine Tool Slideway Lubricant</i></p> <p>DESCRIPTION High quality, machine tool slideway lubricant. Formulated from highly refined mineral oil, with EP, friction modifier, rust and corrosion inhibitors, and tackiness additives, together with good demulsibility properties for coolant separation.</p> <p>Pack size: 205L, 20L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Machine tool slideways and guides: <ul style="list-style-type: none"> - Combined slideway/machine tool hydraulic systems (ISO 32) - Horizontal slideways (ISO 68) - Light-to-moderate applications (ISO 68) - Vertical slideways (ISO 220) - More severe applications (ISO 220) • Suitable for use with Bijur Automatic Lubricant delivery systems. • Other industrial applications requiring an adhesive, corrosion inhibited lubricant with EP properties. 	<p>BENEFITS</p> <p>Reduced downtime EP additive produces a protective film under heavily loaded conditions to prevent wear and scoring of slideways and guides. Rust and corrosion inhibitor protects machine components.</p> <p>Smooth, chatter-free, accurate operation Friction modifier provides high lubricity to reduce friction and drag which can cause stick-slip and machine tool chatter, adversely affecting surface finish on machined pieces. Tackifier provides a high strength, thick oil film that enables accurate table positioning.</p> <p>Stays in place Tackifier prevents fluid from draining away from lubricated surfaces, particularly on vertical ways. Tackiness and high film strength minimises squeeze-out of the lubricant on heavily-loaded ways, and prevents fluid wash-out by emulsifiable cutting fluids.</p> <p>Extends coolant bath life Excellent demulsibility and coolant separability properties enable rapid separation of the way oil from the coolant reducing the tendency of bacteria growth from oil contamination.</p> <p>PERFORMANCE STANDARDS Cincinnati Machine P-47 Heavy-Medium Way Oil</p>
<p>Chain Bar Premium 1518</p> <p><i>Higher Viscosity Chain Oil</i></p> <p>DESCRIPTION Chain Bar Premium is a good quality chain and bar lubricant intended to provide cost effective lubrication of chains, sprockets and guide bars of chain saws with either automatic or hand oilers.</p> <p>Pack size: Bulk only.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Lubrication of the chain, bar and sprocket of all types of chainsaws, using either hand-operated or automatic oilers, where a cost effective product is required. <p>Not recommended for use in severe service conditions. Use Caltex Chain and Bar Oil in these applications.</p>	<p>BENEFITS</p> <p>Reduces wear Reduces wear on the chain, bar and sprocket.</p> <p>Less waste Tackifier minimises sling-off from the chain.</p> <p>Reduced downtime Keeps the saw clean by flushing away wood chips, gum and dust and by removing pitch and preventing further pitch build-up on the chain and bar. Minimises chain adjustment and chain replacement.</p>
<p>Chain & Bar Oil 1367</p> <p><i>Chain Oil</i></p> <p>DESCRIPTION Chain and Bar Oil is a tough, tacky lubricant designed for lubrication of the chain, bar and sprocket on all types of chainsaws and chain-driven machinery. It is made from highly refined high viscosity index base oils along with a highly effective tackiness agent to resist throw-off.</p> <p>Pack size: 205L, 20L, 4L, 1L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Lubrication of the chain, bar and sprocket on all types of chainsaws, using either hand-operated or automatic oilers. It is particularly recommended for use in severe service conditions. • Other chain driven machinery, including motorcycles, lawnmowers, timber jinkers and farm equipment. 	<p>BENEFITS</p> <p>Reduces wear Antiwear additives increase working life of the chain, bar and sprocket.</p> <p>Less waste Tackifier minimises sling-off from the chain.</p> <p>Reduces downtime Keeps the saw clean by flushing away wood chips, gum and dust and by removing pitch and preventing further pitch build-up on the chain and bar. Minimises chain adjustment and chain replacement.</p>

Typical Characteristics

Product	ISO Grade	CODE	Density @ 15 °C kg/L	Pour Point °C	Flash Point °C *	Viscosity cSt @		VI
						40 °C	100 °C	
Way Lubricant X 68	68	1359	0.881	-27	215	64.6	8.42	110
Chain Bar Premium	-	1518	0.894	-12	230	142	15.0	100
Chain & Bar Oil	-	1367	0.892	-12	234	127	-	-

* Cleveland Open Cup Flashpoint

<p>Regal® R&O 46 1335</p> <p><i>Industrial Heat Transfer Oil</i></p> <p>DESCRIPTION Premium quality, inhibited turbine oil also ideally suited to use as a heat transfer fluid in both closed and open heat transfer systems with forced circulation.</p> <p>Pack size: 205L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Heat transfer systems in industrial drying applications, rubber and plastics manufacture, heating of asphalt and fuel oil tanks, food processing, cooking and canning, factory heating, manufacture of soap, resin, glue, dyes, paints, pharmaceuticals and grease, wood laminate, fibre board and veneer manufacture, agricultural heating and drying, and chemical, petroleum and wax processing. • Open systems operating at temperatures up to 200 °C. • Closed systems (sealed with cold oil or inert gas) operating at bulk oil temperatures up to 320 °C. <p>For long, trouble-free service in closed systems, the maximum film temperature on the heater surfaces should be limited to 340 °C. Systems must have forced circulation of the heat transfer fluid.</p>	<p>BENEFITS</p> <p>Maximum energy efficiency Excellent heat transfer properties enable easy circulation and efficient transfer of heat.</p> <p>Resists deposit formation Oxidation and thermal stability resists formation of sludge and coke deposits, providing long oil service life.</p> <p>Rapid response at start-up Low temperature flow characteristics allow prompt circulation.</p> <p>Economical low pressure operation Low vapour pressure at elevated temperatures minimises evaporation, vapour lock and pump cavitation, allowing efficient operation at lower system pressures, avoiding the need for expensive high pressure piping and heat exchangers.</p> <p>PROPERTIES</p> <table border="0"> <tr> <td>Autoignition Temperature, °C</td> <td>-</td> <td>360</td> <td>-</td> </tr> <tr> <td>Properties versus temperature</td> <td>100 °C</td> <td>200 °C</td> <td>300 °C</td> </tr> <tr> <td>Density, kg/L</td> <td>0.83</td> <td>0.77</td> <td>0.70</td> </tr> <tr> <td>Dynamic Viscosity, mPa.s</td> <td>5.40</td> <td>1.20</td> <td>0.52</td> </tr> <tr> <td>Specific Heat, kJ/kg.°C</td> <td>2.12</td> <td>2.50</td> <td>2.87</td> </tr> <tr> <td>Thermal Conductivity, W/m.°C</td> <td>0.126</td> <td>0.119</td> <td>0.112</td> </tr> <tr> <td>Vapour Pressure, mmHg</td> <td>-</td> <td>2.0</td> <td>100</td> </tr> </table>	Autoignition Temperature, °C	-	360	-	Properties versus temperature	100 °C	200 °C	300 °C	Density, kg/L	0.83	0.77	0.70	Dynamic Viscosity, mPa.s	5.40	1.20	0.52	Specific Heat, kJ/kg.°C	2.12	2.50	2.87	Thermal Conductivity, W/m.°C	0.126	0.119	0.112	Vapour Pressure, mmHg	-	2.0	100
Autoignition Temperature, °C	-	360	-																										
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Typical Characteristics

Product	ISO Grade	CODE	Density @ 15 °C kg/L	Pour Point °C	Flash Point °C *	Viscosity cSt @		VI
						40 °C	100 °C	
Regal R&O 46	46	1335	0.874	-9	224	44.0	6.6	100

* Cleveland Open Cup Flashpoint

INDUSTRIAL METALWORKING FLUIDS

<p>Drill Flute Grinding Oil 1527</p> <p><i>Neat Grinding Fluid</i></p> <p>DESCRIPTION A special grinding fluid developed for grinding the flutes on twist drills.</p> <p>Pack size: Bulk only.</p> <p>APPLICATIONS Grinding and honing of</p> <ul style="list-style-type: none"> • Nickel and high nickel alloys. • Low alloy and low Carbon mild steels. • High tensile steels. • Stainless and heat resistant steels. 	<p>BENEFITS</p> <p>Visibility Fairly transparent oil aids visibility of the workpiece.</p> <p>Tool life Good lubricity properties aid tool life.</p> <p>Low foaming Inhibited against foaming and with the ability to separate readily from the very fine swarf.</p>																							
<p>Trusol GP 1704</p> <p><i>General Purpose Soluble Metalworking Fluid</i></p> <p>DESCRIPTION A general purpose, broad spectrum, soluble, cutting oil formulated on paraffinic basestocks with emulsifying agents, anti-rust and anti-corrosion additives. It forms a green emulsion with water and is inhibited against bacterial spoilage.</p> <p>Pack size: 20L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Milling, drilling, turning of low and medium tensile steels, cast iron, brass bronze and aluminium • As a grinding fluid where component finish is a high priority <p>DILUTION RATIO</p> <table> <tr> <td>Turning, milling, drilling</td> <td>1:20</td> </tr> <tr> <td>General machining</td> <td>1:20</td> </tr> <tr> <td>Grinding</td> <td>1:50</td> </tr> <tr> <td>Tapping, screwing</td> <td>1:10 to 1:15</td> </tr> </table>	Turning, milling, drilling	1:20	General machining	1:20	Grinding	1:50	Tapping, screwing	1:10 to 1:15	<p>BENEFITS</p> <p>Stable safe concentrate Concentrate exhibits good shelf life and is free of phenol, cresol and nitrite.</p> <p>Stable safe emulsion Mixes readily with water to form a stable oil-in-water emulsion. Resistant to bacterial growth and consequent rancidity. Disposable through conventional acid splitting techniques.</p> <p>Protects and cools Inhibits rust and corrosion. Trusol GP exhibits good wetting and heat transfer properties, and a low foaming tendency.</p> <p>PROPERTIES</p> <table> <tr> <td>Colour,</td> <td>Neat</td> <td>Green</td> </tr> <tr> <td></td> <td>Emulsion</td> <td>Pale green</td> </tr> <tr> <td>pH,</td> <td>Concentrate</td> <td>10.1</td> </tr> <tr> <td></td> <td>5.0% dilution</td> <td>9.4</td> </tr> <tr> <td></td> <td>10.0% dilution</td> <td>9.6</td> </tr> </table>	Colour,	Neat	Green		Emulsion	Pale green	pH,	Concentrate	10.1		5.0% dilution	9.4		10.0% dilution	9.6
Turning, milling, drilling	1:20																							
General machining	1:20																							
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	Emulsion	Pale green																						
pH,	Concentrate	10.1																						
	5.0% dilution	9.4																						
	10.0% dilution	9.6																						
<p>Trusol EP 1703</p> <p><i>Extreme Pressure Soluble Metalworking Fluid</i></p> <p>DESCRIPTION An extreme pressure soluble cutting oil formulated on paraffinic basestocks with emulsifying agents, anti-rust and anti-corrosion additives and an extreme pressure additive. It forms a white emulsion of high lubricity when diluted with water and is inhibited against bacterial spoilage.</p> <p>Pack size: 20L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Heavy duty machining such as tapping and threading of high carbon alloy and stainless steels. <p>DILUTION RATIO</p> <table> <tr> <td>Heavy duty machining</td> <td>1:8</td> </tr> <tr> <td>General machining</td> <td>1:20 to 1:30</td> </tr> <tr> <td>Grinding</td> <td>1:40</td> </tr> <tr> <td>Tapping, screwing</td> <td>1:8</td> </tr> </table>	Heavy duty machining	1:8	General machining	1:20 to 1:30	Grinding	1:40	Tapping, screwing	1:8	<p>BENEFITS</p> <p>Stable safe concentrate Concentrate exhibits good shelf life and is free of phenol, cresol and nitrite.</p> <p>Stable safe emulsion Mixes readily with water to form a stable oil-in-water emulsions. Resistant to bacterial growth and consequent rancidity. Disposable through conventional acid splitting techniques.</p> <p>Protects and cools Inhibits rust and corrosion. Good wetting and heat transfer properties. Low foaming tendency.</p> <p>PROPERTIES</p> <table> <tr> <td>Colour</td> <td>Neat</td> <td>Medium brown</td> </tr> <tr> <td></td> <td>Emulsion</td> <td>white</td> </tr> <tr> <td>pH</td> <td>Concentrate</td> <td>10.9</td> </tr> <tr> <td></td> <td>5.0% dilution</td> <td>9.5</td> </tr> <tr> <td></td> <td>10.0% dilution</td> <td>9.3</td> </tr> </table>	Colour	Neat	Medium brown		Emulsion	white	pH	Concentrate	10.9		5.0% dilution	9.5		10.0% dilution	9.3
Heavy duty machining	1:8																							
General machining	1:20 to 1:30																							
Grinding	1:40																							
Tapping, screwing	1:8																							
Colour	Neat	Medium brown																						
	Emulsion	white																						
pH	Concentrate	10.9																						
	5.0% dilution	9.5																						
	10.0% dilution	9.3																						

Typical Characteristics

Product	CODE	Density @ 15 °C kg/L	Flash Point °C	Viscosity @ 40 °C
Drill Flute Grinding Oil	1527	0.872	190 ¹	22
Trusol GP	1704	0.906	-	31.5
Trusol EP	1703	0.945	-	40

¹ Cleveland Open Cup Flashpoint

INDUSTRIAL MOULD RELEASE OILS

There are numerous factors influencing the selection of a mould release agent, i.e., the type of clay or concrete mix, the size, shape and type of the mould or form, the surface finish required and the rate of production. Caltex markets a wide variety of mould oils

<p>Erdol CRA 91 1403</p> <p>DESCRIPTION A premium quality, general purpose concrete release oil incorporating additives which give an "architectural" finish with minimum patchwork when formwork is removed. Applied by brush, swab, spray or dipping.</p> <p>Pack size: 205L.</p>	<p>Mould Oil 22 1325</p> <p>DESCRIPTION A concrete release oil for steel and plastic moulds with effective coverage by spray application.</p> <p>Pack size: Bulk only.</p>
<p>Mould Oil 010 1449</p> <p>DESCRIPTION A concrete and clay release agent for spray application on concrete and steel moulds and especially for use on vertical steel moulds. It is also suitable for clay extrusion. It may be diluted with distillate as required. Applied by brush, swab or spray. The product may darken and take on a pink or reddish tinge over time. This colour change will not affect the performance of the product.</p> <p>Pack size: 205L.</p>	<p>Mould Oil 275 1452</p> <p>DESCRIPTION A product similar to Mould Oil 3, but more highly concentrated.</p> <p>Pack size: Bulk only.</p>
<p>Mould Oil 20 1450</p> <p>DESCRIPTION A general purpose high quality concrete release agent for formwork covering a wide usage range, from ornamental work to large surface areas. It is particularly suited to the precast industry. Consists of a mineral oil base plus a "fatty" surface active release agent and is designed with a high viscosity such that it will not run off or absorb into wood and masonite formwork. Applied by spray, brush or swab at a rate of 65-75 m² per 4 litres.</p> <p>Pack size: 205L, 20L.</p>	<p>Mould Oil 3 1453</p> <p>DESCRIPTION A low viscosity die lubricant for clay extrusion (bricks, tiles, pavers and pipes) and a release agent for concrete. It prevents pick-up of clay on the die and clay surface imperfections. It is used extensively in concrete pipe manufacture. Applied by brush, swab or spray.</p> <p>Pack size: 205L.</p>

Typical Characteristics

Product	CODE	Density @ 15 °C kg/L	Flash Point °C	Viscosity cSt @ 40 °C	Saponification Number mgKOH/g
Erdol CRA 91	1403	0.850	70	2.5	4.0
Mould Oil 010	1449	0.867	190	21	21
Mould Oil 20	1450	0.860	70	6.8	7.0
Mould Oil 22	1325	0.870	70	18.9	21
Mould Oil 275	1452	0.846	70	3.9	16
Mould Oil 3	1453	0.845	70	4.0	10.0

INDUSTRIAL ROCK DRILL OILS

Rock Drill Lube 100, 320, 460 1608, 1609, 2593

Pneumatic Percussion Tool Lubricant

DESCRIPTION

High performance lubricant for percussion-type air tools. Formulated from highly refined mineral oils, EP, oiliness and tackiness additives, emulsifiers, rust and corrosion inhibitors, and anti-foam and anti-fogging agents.

Pack sizes: 20L. ISO 100 also available in 205L.

APPLICATIONS

Percussion-type air tools operating under wet or dry conditions, including:

- Rock drills.
- Concrete/pavement breakers (jackhammers).
- Tampers.
- Rammers.
- Riveting and chipping hammers, etc.

BENEFITS

Maximum working life of equipment

Special EP and high film strength oiliness additives withstand shock loads under boundary lubrication conditions and protect components against wear.

Protects surfaces in wet conditions

Superior emulsification properties prevent water wash-off from critical areas when operating with wet air, or during hollow rod "wet drilling" operations. Effective rust and corrosion inhibitor system protects critical components in wet air or "wet drilling" operation.

Trouble-free operation

Highly refined base oils with low carbon forming characteristics and special oxidation inhibitor prevent the formation of sludge and deposits which can produce sluggish valve action. Effective anti-foam inhibitor resists foaming in air-line lubricators to enable easy control of oil feed by ensuring regular supply of lubricant to the tool. Special anti-misting additive minimises oil fog formation in equipment exhausts.

PERFORMANCE STANDARDS

Rock Drill Lubes are suitable for use with equipment from Atlas Copco, Consolidated Pneumatic, Gardner Denver, Ingersoll Rand, Yamamoto and other manufacturers except for Holman and Broomwade - use Rando HD 32 or Delo Silver SAE 10W.

Typical Characteristics

Product	ISO Grade	CODE	Density @ 15 °C kg/L	Pour Point °C	Flash Point °C *	Viscosity cSt @		VI	Timken OK Load kg	4 Ball Weld Load Kg
						40 °C	100 °C			
Rock Drill Lube 100	100	1608	0.927	-24	204	100	11.1	95	25.4	320
Rock Drill Lube 320	320	1609	0.934	-15	232	301	23.2	96	25.4	320
Rock Drill Lube 460	460	2593	0.904	-9	232	462	30.7	96	25.4	320

* Cleveland Open Cup Flashpoint

Regal® R&O 32, 46, 68, 100 1334, 1335, 1336, 1333

Industrial Turbine Oil

DESCRIPTION

Inhibited turbine oil formulated from highly refined base stocks and special rust, oxidation and foam inhibitors. While principally turbine oils, these lubricants find some use in compressors.

Pack sizes: 205L, 20L. ISO 100 not available in 20L.

APPLICATIONS

- Steam and hydraulic turbines operating under all service conditions.
- Industrial gas turbines operating under moderate service conditions where the oil is not exposed to excessively high temperatures, or gearsets requiring enhanced load carrying performance.
- Bath and circulating systems supplying rolling element bearings of all types, lightly loaded gear sets, vacuum pumps, machine tools (including computer controlled units), conveyors, electric motors, and low to moderate pressure hydraulic pumps where anti-wear properties are not required.
- Centrifugal, rotary and reciprocating compressors, turbo-blowers and centrifugal pumps, requiring a rust and oxidation inhibited oil.
- Regal R&O 46 may be used as a heat transfer fluid in open systems operating at temperatures up to 200°C and in closed systems (sealed with cold oil or inert gas) operating at bulk oil temperatures up to 320°C

Not recommended for use in breathing air compressors.

BENEFITS

Prolonged oil service life

Multi-component inhibitor system resists oil oxidation during exposure to high temperature conditions, ensuring longer service life.

Saves on maintenance and downtime

The highly refined base stocks and multi-component oxidation inhibitor system resist the formation of harmful sludge and varnish deposits. The special rust inhibitor protects components against corrosion.

Trouble-free operation

The water separability of Regal R&O allows rapid settling of harmful water accumulated from steam condensate. The non-silicone foam inhibitor allows rapid release of entrained air while minimising foam enabling reliable operation of sensitive hydraulic control devices.

Saves on inventory

The rust and oxidation inhibited formulation has multipurpose capability, simplifying oil inventories and reducing the possibility of misapplication.

PERFORMANCE STANDARDS

ANSI/AGMA	9005-E02: AGMA Lubricant Nos. 1,2,3 (ISO 46, 68, 100, respectively)
British Standard	BS 489:1999 (ISO 32 to 68)
Cincinnati Machine	P-38, P-55, P-54 (ISO 32, 46, 68, respectively)
David Brown	Table M Gear Oil Grades OM, IM, 2M, 3M (ISO 32 to 100, respectively)
German Standard	DIN 51515 Part 1

Meets the requirements of major turbine builders including Alstom (and former ABB), GE, Siemens-Westinghouse.

Regal® EP 32 2724

Industrial Anti-Wear Type Gas Turbine Oil

DESCRIPTION

Anti-wear turbine oil formulated from severely refined turbine-grade base stocks, an ashless anti-wear additive system and special rust, oxidation and foam inhibitors, and metal passivators. Specifically designed for use in gas turbines with reduction gear sets.

Pack sizes: 205L.

APPLICATIONS

- Stationary industrial gas turbines with reduction gear sets.
- Other gas turbines in moderate service where the lubricant is not exposed to extremely high temperatures. For high severity applications, Gas Turbine Oil is recommended.
- Steam and hydraulic turbines under all operating conditions.
- All rotating machinery in gas and steam combined-cycle cogeneration units.
- Bath and circulating systems supplying moderately loaded gear sets, moderate pressure hydraulic pumps, vacuum pumps, rolling element bearings, machine tools, conveyors, and electric motors.
- Air compressors, turbo-blowers and centrifugal pumps requiring a rust and oxidation inhibited oil.

Not recommended for aviation-type gas turbines.

BENEFITS

Prolonged life of reduction gear sets

Anti-wear additive system forms a protective chemical film on heavily loaded gear tooth surfaces to minimise wear and scuffing.

Prolonged oil service life

Severely refined base stocks and special inhibitor system provide long-term oxidation stability to resist oil breakdown under severe, high temperature conditions. The metal passivators minimise the catalytic effect of copper components on oil breakdown.

Saves on maintenance and downtime

Severely refined base stocks and special oxidation inhibitor system resist the formation of harmful deposits in high temperature bearings and other hot areas of the turbine. The highly effective rust inhibitor protects system components against corrosion. Good water separability ensures rapid settling of water accumulated from steam condensate, or leakage from salt water cooling.

Minimum operational problems

Non-silicone foam inhibitor allows rapid release of entrained air while minimising foam formation to enable reliable operation of sensitive hydraulic control devices. The multipurpose nature of the formulation enables use in a wide range of industrial applications, simplifying oil inventories and reducing the possibility of using the wrong lubricant.

PERFORMANCE STANDARDS

British Standard	BS 489:1999
German Standard	DIN 51515 Part 1
Siemens-Westinghouse	(approved)
Alstom (former ABB)	
EGT	

Regal® Marine 77 (OEP 89)

1332

Extreme Pressure Marine Turbine Oil

DESCRIPTION

Inhibited EP-type marine turbine oil formulated from highly refined base stocks, and a special additive package that provides turbine performance with EP properties.

Pack sizes: 205L, 20L.

APPLICATIONS

- Steam turbine bearings and reduction gearing on modern design geared turbine vessels where gear loads are heavy.
- Steam turbine bearings and reduction gearing on older vessels where gear wear has been experienced with conventional turbine oils.
- Auxiliary turbines and marine hydraulic equipment not normally exposed to very low ambient temperatures.
- General shipboard lubrication.
- Industrial geared turbine applications where wear on the gears has been a problem.

BENEFITS

Prolonged life of reduction gear sets

The special EP additive system forms a protective film on heavily loaded gear tooth surfaces to minimise wear and scuffing, even under shock loading conditions.

Saves on maintenance and downtime

The highly refined base stocks and special oxidation inhibitor system resist the formation of harmful sludge and varnish deposits. The highly effective rust inhibitor protects components against corrosion in the presence of both fresh and salt water.

Trouble-free operation

The water separability of the highly refined base stocks and special inhibitor system ensure rapid settling of both fresh and salt water contamination. The non-silicone foam inhibitor allows rapid release of entrained air while minimising foam formation to enable reliable operation of sensitive hydraulic control devices.

Saves on shipboard inventory

The rust and oxidation inhibited, EP formulation has multipurpose capability aboard ship, simplifying oil inventories and reducing the possibility of using the wrong lubricant.

PERFORMANCE STANDARDS

U.S. Military MIL-PRF-17331J

Typical Characteristics

Product	ISO Grade	CODE	Density @ 15 °C kg/L	Pour Point °C	Flash Point °C *	Viscosity cSt @		VI
						40 °C	100 °C	
Regal R&O 32	32	1334	0.871	-9	212	30.6	5.3	102
Regal R&O 46	46	1335	0.874	-9	224	44.0	6.6	100
Regal R&O 68	68	1336	0.875	-9	234	65.0	8.4	98
Regal R&O 100	100	1333	0.887	-9	254	95.5	10.8	96
Regal EP 32	32	2724	0.855	-30	230	30.6	5.4	111
Regal Marine 77	"77"	1332	0.883	-9	240	78.4	9.5	98

* Cleveland Open Cup Flashpoint

INDUSTRIAL TRANSFORMER OILS

<p>Transformer Oil BSI 1692</p> <p><i>Electrical Insulating Oil</i></p> <p>DESCRIPTION Highly refined, naphthenic transformer oil. For use where insulating oils meeting IEC 60296-2003 Class I, BS148:1998 Class I or Australian Standard AS 1767.1- 1999 transformer oil specifications are recommended. Does not contain polychlorinated biphenyls (PCBs).</p> <p>Pack sizes: 205L, 20L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Transformers. • Oil-immersed switchgear. • Circuit breakers. • Oil-filled capacitors. • Tap changers. • Electrical reclosures. • Fuses. 	<p>BENEFITS</p> <p>Prolongs transformer life Excellent conductive heat transfer properties improve cooling of transformer components. Low solvency protects electrical wire enamels.</p> <p>Maximises life of oil-immersed switches Rapid quenching of arcs reduces contact erosion.</p> <p>Maintains transformer efficiency High dielectric strength and low dissipation factor provide excellent insulating characteristics.</p> <p>Long service life Highly refined base fluids limit the formation of sludge, deposits and soluble compounds which lead to a breakdown of the oil's electrical properties.</p> <p>PERFORMANCE STANDARDS Australian Standard AS1767.1-1999 Class I IEC 60296-2003</p>
<p>Transformer Oil BSI Inhibited 1693</p> <p><i>Electrical Insulating Oil</i></p> <p>DESCRIPTION Highly refined, inhibited, naphthenic transformer oil. For use in severe conditions, such as high ambient temperatures, where oxidation resistant and thermally stable insulating oils meeting IEC 60296-2003 Class IA or BS148:1998 Class IA transformer oil specifications are recommended. Does not contain poly-chlorinated biphenyls (PCBs).</p> <p>Pack size: 205L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Transformers. • Oil-immersed switchgear. • Circuit breakers. • Oil-filled capacitors. • Tap changers. • Electrical reclosures. • Fuses. 	<p>BENEFITS</p> <p>Extended service life Effective anti-oxidation inhibitor limits the formation of sludge, deposits and soluble compounds which break down the electrical properties of the oil in severe, high ambient temperature or extended service conditions.</p> <p>Prolongs transformer life Excellent conductive heat transfer properties improve cooling of transformer components. Low solvency protects electrical wire enamels.</p> <p>Maximises life of oil-immersed switches Rapid quenching of arcs reduces contact erosion.</p> <p>Maintains transformer efficiency High dielectric strength and low dissipation factor provide excellent insulating characteristics.</p> <p>PERFORMANCE STANDARDS Australian Standard AS1767.1-1999 Class IA IEC 60296-2003</p>

Typical Characteristics

Product	ISO Grade	CODE	Density @ 15 °C kg/L	Pour Point °C	Flash Point °C *	Viscosity cSt @	
						40 °C	-30 °C
Transformer Oil BSI	10	1692	0.884	-48	146	10.2	1045
Transformer Oil BSI Inhibited	10	1693	0.884	-48	146	10.2	1226

* Cleveland Open Cup Flashpoint

INDUSTRIAL VACUUM PUMP OIL

<p>Vacuum Pump Oil R31 1595</p> <p><i>Vacuum Pump Oil</i></p> <p>DESCRIPTION Vacuum Pump Oil R31 is an ISO 68 oil blended from high quality solvent refined paraffinic basestocks. It does not contain additives and hence eliminates the possibility of vapour pressure increases due to additive introduced volatility.</p> <p>Pack size: 4L.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Vacuum pumps, particularly those associated with the refrigeration trade and milk primary producers. • Only for use in clean machines. • Originally designed for Robinaire vacuum pumps which were widely used in the refrigeration industry for vacuum down to 0.01 mmHg. 	<p>BENEFITS</p> <p>Additive free: Highly refined straight mineral oil, eliminates the possibility of vapour pressure increases due to additives.</p> <p>Trouble free operation: Offers excellent filterability and water separation properties and minimises deposit formation.</p> <p>PERFORMANCE STANDARDS ISO 68</p>
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Typical Characteristics

Product	ISO Grade	CODE	Density @ 15 °C kg/L	Pour Point °C	Flash Point °C *	Viscosity cSt @		VI
						40 °C	100 °C	
Vacuum Pump Oil R31	68	1595	0.881	-9	232	68	8.8	97

* Cleveland Open Cup Flashpoint

<p>Delo® Grease EP2 2909</p> <p><i>Heavy Duty Wheel Bearing & Chassis and Specialty Industrial Grease</i></p> <p>DESCRIPTION Premium performance technically advanced multipurpose EP automotive wheel bearing, chassis and heavy duty industrial grease. Delo Grease EP 2 is engineered to minimise friction and wear providing exceptional protection and performance. NLGI grade 2 and brilliant blue in colour.</p> <p>Pack size: 180kg, 20kg, 450g.</p> <p>APPLICATIONS</p> <table border="0"> <tr> <td style="vertical-align: top;"> <p>Automotive</p> <ul style="list-style-type: none"> • Heavy-duty on-road truck and bus wheel bearings • Truck and bus chassis lubrication • Heavy-duty off-road vehicle wheel bearings • General automotive wheel bearing and chassis lubrication • Fifth wheel lubrication </td> <td style="vertical-align: top;"> <p>Industrial</p> <ul style="list-style-type: none"> • Heavy Duty Industrial greasing • General Industrial greasing • Construction equipment • Agricultural tractors • Heavy-duty transport </td> </tr> </table> <p>Usable temperature range in continuous service is -40 to 177 °C. Maximum temperature for short term exposure is 220 °C.</p>	<p>Automotive</p> <ul style="list-style-type: none"> • Heavy-duty on-road truck and bus wheel bearings • Truck and bus chassis lubrication • Heavy-duty off-road vehicle wheel bearings • General automotive wheel bearing and chassis lubrication • Fifth wheel lubrication 	<p>Industrial</p> <ul style="list-style-type: none"> • Heavy Duty Industrial greasing • General Industrial greasing • Construction equipment • Agricultural tractors • Heavy-duty transport 	<p>BENEFITS</p> <p>Minimise fleet maintenance costs Advanced ISOSYN™ technology provides longer service life and improved temperature stability for wheel bearings operating near the high temperature of disk brakes, enabling regreasing intervals to be extended when compared to standard products in this category.</p> <p>Minimises downtime and operating costs Excellent wear protection under severe conditions and shock loading due to specially formulated EP additives. Natural water resistance of the lithium complex thickener, combined with the additional tackiness additive, prevents water washout. Effective rust and corrosion inhibitors protect metal surfaces under conditions of severe water exposure.</p> <p>Extends equipment life High level of anti-wear and extreme pressure additives protect against component damage by wear and shock loading. Highly loaded parts operating under boundary lubrication conditions are protected, giving longer equipment life and improved reliability.</p> <p>Minimises inventory costs Multipurpose capability allows use in a wide range of automotive and industrial applications, reducing the number of different greases required and eliminating product misapplication.</p> <p>PERFORMANCE STANDARDS</p> <table border="0"> <tr> <td>NLGI</td> <td>Service Category GC-LB</td> </tr> <tr> <td>Mack</td> <td>Meets MG-C specification</td> </tr> </table>	NLGI	Service Category GC-LB	Mack	Meets MG-C specification
<p>Automotive</p> <ul style="list-style-type: none"> • Heavy-duty on-road truck and bus wheel bearings • Truck and bus chassis lubrication • Heavy-duty off-road vehicle wheel bearings • General automotive wheel bearing and chassis lubrication • Fifth wheel lubrication 	<p>Industrial</p> <ul style="list-style-type: none"> • Heavy Duty Industrial greasing • General Industrial greasing • Construction equipment • Agricultural tractors • Heavy-duty transport 						
NLGI	Service Category GC-LB						
Mack	Meets MG-C specification						
<p>Liplex EP2 1090</p> <p><i>Multipurpose EP Lithium Complex Grease</i></p> <p>DESCRIPTION Multipurpose EP high melting point lithium complex grease offering shear stability, thermal stability, water resistance and pumpability. It has an NLGI grade 2 consistency. It contains a tackiness agent and is blue-green in colour.</p> <p>Pack size: 180kg, 20kg, 55kg, 2.5kg, 500g, 450g.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Where high thermal and oxidation stability and high water resistance is required. • Where either soap based or clay based greases are recommended, particularly where rationalisation of grease types is required. • These applications include automotive, industrial, mining, earthmoving and marine applications such as wheel bearings, chassis, pre-packed and sealed-for-life bearings in steel, cement, sugar, mining and other heavy industries, boat trailer wheel bearings, outboard motor fittings, winches, splines, cables, rollers and linkages. 	<p>Usable temperature range in continuous service is -25 to 140 °C. Maximum temperature for short term exposure is 220 °C.</p> <p>BENEFITS</p> <p>Extends equipment life and reduces maintenance costs Film strength and extreme pressure additive package reduces component wear under severe conditions and shock loading. The tackifier and mechanically stable soap structure ensure that the grease stays in place to lubricate and seal against ingress of dirt and dust.</p> <p>Resists effects of water Rust and corrosion inhibitors protect metal surfaces under wet conditions. Soap structure and polymeric additives resist water washout.</p> <p>Wide temperature operability Oxidation resistance and thermal stability aid operation at elevated temperature while good pumpability assists operation at cold temperatures.</p> <p>PERFORMANCE STANDARDS</p> <table border="0"> <tr> <td>NLGI</td> <td>Service Category GC-LB</td> </tr> </table>	NLGI	Service Category GC-LB				
NLGI	Service Category GC-LB						
<p>Liplex Heavy Duty 2 3043</p> <p><i>Heavy Duty Industrial and Automotive Grease</i></p> <p>DESCRIPTION Premium, multipurpose EP, heavy-duty industrial and automotive grease containing an ISO 680 mineral base oil, a lithium complex thickener, EP additives, rust and oxidation inhibitors and polymer additives. Brown in colour. It is available only in an NLGI grade 2.</p> <p>Pack size: 180kg, 20kg, 450g.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Industrial applications, construction equipment and agricultural tractors where, due to extremely heavy loads, a more viscous base oil is required to provide a thicker lubricating film. • Heavy duty automotive service such as wheel bearings and chassis on trucks and buses. 	<p>Usable temperature range in continuous service is -15 to 130 °C. Maximum temperature for short term exposure is 210 °C.</p> <p>BENEFITS</p> <p>Saves maintenance costs Effective EP additive protects against component wear under severe conditions and shock loading. Rust and corrosion inhibitors protect metal surfaces, even in conditions of severe water exposure.</p> <p>Minimises downtime High dropping point minimises leakage at elevated temperatures, and excellent oxidation resistance ensures long grease life. Natural water resistance of the lithium complex thickener impedes water wash-out.</p> <p>Minimises inventory costs Multipurpose capability allows use in a wide range of heavy-duty automotive and industrial applications where a higher oil viscosity is preferred.</p>						

<p>Mine Grease Premium 3021</p> <p><i>Specialty Industrial Grease</i></p> <p>DESCRIPTION NLGI grade 2 lithium complex grease formulated with high viscosity base oils, EP additives, rust and oxidation inhibitors and molybdenum disulfide. Strong tackiness promotes good adherence. Designed for slow to medium speed bearings. Suitable for heavy-duty industrial, mining, construction and agricultural equipment, particularly where high loads and shock loads are encountered.</p> <p>Pack size: 180kg, 20kg, 450g.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Mining, earthmoving and quarrying • Construction equipment • Agricultural equipment • Centralised lubrication systems • Heavy-duty industrial greasing • Industrial plain and rolling element bearings <p>Usable temperature range in continuous service is -20 to 130 °C Maximum temperature for short term exposure is 220 °C.</p>	<p>BENEFITS</p> <p>Saves maintenance costs Effective EP additive, high base fluid viscosity and molybdenum disulfide solid lubricant film protect against component wear under severe and shock loading. Rust and corrosion inhibitors protect metal surfaces, even in conditions of severe water exposure.</p> <p>Minimises losses Heavy base oil and tackiness minimises leakage and fling off and provides superior adhesion on pins and shackle joints. High dropping point minimises leakage at elevated temperatures.</p> <p>Minimises downtime Excellent oxidation resistance ensures long grease life. Natural water resistance of the lithium complex thickener, very effective tackiness properties and the additional molybdenum disulfide solid film lubricant prevent lubricant failure, even under the wettest conditions.</p> <p>Easy of Application Good pumpability characteristics of the lithium complex thickener provide suitable flow properties for most centralised lubrication system applications.</p> <p>Minimises inventory costs Multipurpose capability allows use in a wide range of heavy-duty industrial applications where a higher oil viscosity is preferred.</p> <p>PERFORMANCE STANDARDS Komatsu Mining Germany Works Standard.</p>
<p>Miltex® EP 15001 LX 2872</p> <p><i>Specialty Industrial Grease</i></p> <p>DESCRIPTION NLGI grade 1 lithium complex based grease. It is formulated with high viscosity base oils and blended with EP additives, rust and oxidation inhibitors and molybdenum disulfide. Designed to be used in slow to medium speed bearings due to the high base oil viscosity. Suitable for heavy industrial, mining, steel and construction application.</p> <p>Pack size: Available in IBV.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Industrial plain and rolling element bearings • Centralised lubrication systems • Construction equipment • Earthmoving, quarrying and mining • Agricultural equipment • Heavy-duty industrial greasing • Steel industry <p>Usable temperature range in continuous service is -20 to 130 °C Maximum temperature for short term exposure is 220 °C.</p>	<p>BENEFITS</p> <p>Saves maintenance costs Effective EP additive, high base fluid viscosity and additional molybdenum disulfide solid film lubricant protect against component wear under severe conditions and shock loading. Rust and corrosion inhibitors protect metal surfaces, even in conditions of severe water exposure.</p> <p>Minimises downtime High dropping point minimises leakage at elevated temperatures, and excellent oxidation resistance ensures long grease life. Natural water resistance of the lithium complex thickener, plus additional tackiness additive, and the additional molybdenum disulfide solid film lubricant prevent lubricant failure, even under the wettest conditions.</p> <p>Easy of Application Good pumpability characteristics of the lithium complex thickener provide suitable flow properties for most centralized lubrication system applications.</p> <p>Minimises inventory costs Multipurpose capability allows use in a wide range of heavy-duty industrial applications where a higher oil viscosity is preferred.</p>

Ultra-Duty® Grease 1, 2

1076, 1077

Automotive Chassis & Bushing and Specialty Industrial Grease

DESCRIPTION

Premium, heavy-duty EP grease containing a high viscosity mineral oil, lithium thickener, special EP additive, rust and oxidation inhibitors and tackiness agent. Stay-in-place properties make it particularly suitable for automotive and industrial equipment operating in wet, muddy or dusty conditions. Red in colour.

Pack size: 180kg, 20kg. NLGI 2 also available in 55kg, 2.5kg and 450g.

APPLICATIONS

Automotive

- Heavy-duty transport.
- Chassis lubrication.
- Construction equipment.
- Agricultural tractors.
- Off-highway construction.
- Mining.
- Logging and forestry.
- Quarrying.

Industrial

- Pulp and paper machinery.
- Mining.
- Logging and forestry.
- Quarrying.
- Material handling equipment.
- Dredging equipment.
- Offshore oil drilling.
- Marine deck equipment.
- General industrial greasing.

Usable temperature range in continuous service is -20 to 140 °C for the NLGI 1 grade and -10 to 140 °C for the NLGI 2 grade. Maximum temperature for short term exposure is 155 °C for NLGI 1 and 165 °C for NLGI 2.

Not recommended for wheel bearing lubrication of on-highway vehicles.

BENEFITS

Reduces maintenance costs

Outstanding film strength and effective EP additive protect against component wear under severe conditions and shock loading. Extreme tackiness maintains sealing collar of grease around bushings which prevents the ingress of abrasive dirt. Excellent resistance to water wash out ensures lubrication is maintained under extremely wet and muddy conditions.

Extended service lubrication

Superior adhesiveness ensures grease stays in place and resists leakage, even in the most severe and shock load conditions, making it possible to extend relubrication intervals.

Protects against corrosion

Highly effective rust and corrosion inhibitors protect metal surfaces, even under extremely wet conditions.

EP Grease C

Multipurpose Extreme Pressure Grease

NLGI Grade	000	00	0	1	2	3
Product Code	1082	1081	1080	1083	1084	1085

DESCRIPTION

EPC Greases are multipurpose extreme pressure, industrial and automotive greases made from lithium soap, sulfur phosphorus extreme pressure additives, high quality base oils and rust and oxidation inhibitors.

EPC Greases have excellent load carrying capacity and good resistance to water washing. They are stable in storage and do not soften excessively under severe working, or harden in high temperature service. They are manufactured in NLGI grades 000, 00, 0 1, 2 and 3.

Pack size: 180kg (all grades except NLGI 000), 20kg (all grades), 450g (NLGI 2 and 3 only).

APPLICATIONS

- General purpose grease applications on passenger cars, trucks, buses, trailers and farm tractors and industrial equipment. These include wheel bearings (where lower operational temperatures occur), anti-friction bearings, ball joints, all chassis points, universal joints, splines, linkages, water pumps and steering gears.
- General industrial and agricultural use, including needle and plain bearings, cranes, pumps, winches and other equipment, particularly where heavy or shock loads require the use of extreme pressure greases with good retention properties.

- Used in prepacked and sealed for life bearings.
- EPC2 is a general multipurpose bearing grease for automotive and industrial equipment and EPC3 for larger bearings subject to vibration (trucks and tractors).
- EPC 000, 00 and 0 are popular in centralised systems on underground coal mining machinery, as track roller lubricants and in rotary slasher gearboxes.
- Not recommended for use in high temperature applications, e.g. wheel bearings fitted with disk brakes.

Operating temperatures as per table at end of section.

Maximum temperature for short term exposure for NLGI 1, 2 and 3 is 175 °C

BENEFITS

Reduced Inventory

Simplifies inventory since one product can be used for many automotive and industrial grease application points.

Longer component life

Increases bearing and ball joint life by ensuring low wear rates under severe service conditions. Good oxidation stability provides long service life, especially where extended relubrication intervals are followed. Effectively lubricates and protects even under overload or shock load conditions frequently encountered in automotive service.

Lubricates in wet conditions

Resists water washing to provide satisfactory lubrication under the most adverse conditions.

PERFORMANCE STANDARDS

GMH	HN1729, HN1421
Ford	ESN-MIC-160A/B, ESB-MIC-119A.

<p>Molygrease EP 2 1093</p> <p><i>Extreme Pressure Grease</i></p> <p>DESCRIPTION Molygrease EP2 is a multipurpose, extreme pressure, lithium soap based grease containing molybdenum disulfide. It contains rust and oxidation inhibitors and sulfur phosphorus EP additives. It possesses good mechanical stability, water resistance and low temperature properties. It is black in colour.</p> <p>Pack size: 180kg, 55kg, 20kg, 2.5kg, 450g.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Heavily loaded industrial and automotive applications. • Mining and construction vehicles such as scrapers, loaders, shovels and off-highway trucks in dusty or wet conditions. • All grease lubricated chassis points on passenger cars, trucks, buses, trailers, and farm equipment, including kingpins, shackle pins, steering joints, universal joints and fifth wheels (semi-trailer support turntables) on trucks. • Ball joint suspensions on passenger cars where the presence of molybdenum disulfide may reduce noise and steering effort. • Industrial applications such as low to medium load bearings, steam turbine pedestal slides, screw threads, screw railway couplings, adjustable tension rods and steam valves. • Particularly recommended for applications where movement is slow, restricted or intermittent and where movement is small but of high frequency. In these applications the solid film of molybdenum disulfide will provide protection against wear, fretting corrosion and stick-slip effects. 	<ul style="list-style-type: none"> • High temperature conditions, such as conveyor belts in ovens, because even though the grease chars or evaporates, the molybdenum disulfide is left behind to provide lubrication. <p>Usable temperature range in continuous service is -30 to 130 °C. Maximum temperature for short term exposure is 175 °C.</p> <p>BENEFITS</p> <p>Saves on heavy-duty maintenance Effective EP additive and molybdenum disulfide solid film lubricant protect against component wear under high load conditions and/or shock loading. Rust and corrosion inhibitors protect metal surfaces in wet operating conditions.</p> <p>Solid film lubrication Molybdenum disulfide component which plates out and resists wiping from lubricated surfaces, providing a solid lubricating film that reduces wear and friction.</p> <p>Reduced inventory Multipurpose capability allows use in a wide range of heavy-duty automotive and industrial applications, reducing the number of different greases required and eliminating product misapplication.</p> <p>Lubrication in dusty or wet conditions Resists water washing and continues to provide effective lubrication in dusty or wet conditions.</p> <p>PERFORMANCE STANDARDS</p> <table border="0"> <tr> <td>GMH</td> <td>HN 1416</td> </tr> <tr> <td>Ford</td> <td>ESA-MIC-75A/B</td> </tr> </table>	GMH	HN 1416	Ford	ESA-MIC-75A/B
GMH	HN 1416				
Ford	ESA-MIC-75A/B				
<p>Molygrease Heavy 1094</p> <p><i>Heavy Duty Extreme Pressure Grease</i></p> <p>DESCRIPTION Molygrease Heavy is a high quality, NLGI grade 2, multipurpose, lithium based grease. It is formulated with high viscosity base oils and fortified with extreme pressure additives and molybdenum disulfide to provide protection where high and shock loads are encountered, especially in heavy industrial, mining and agricultural equipment.</p> <p>Molygrease Heavy resists oxidation and corrosion and has excellent mechanical and thermal stability together with good water resistance and pumpability. Molygrease Heavy supplements Molygrease EP2.</p> <p>Pack size: 180kg, 20kg.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Heavy industrial, agricultural, mining and automotive equipment particularly where high loads and shock loads are encountered. • Slower speed, heavily loaded bearings in mining and industrial applications such as haul trucks, loaders, dozers, sugar mills, roll mills and crushers. • Wheel bearings, anti-friction bearings, linkages, pins, bushes, turntables, chassis, shackle joints, universal joints, ball joints and other applications in mining, agricultural and construction equipment such as tractors, scrapers, loaders, shovels and off-highway trucks. 	<p>Usable temperature range in continuous service is -20 to 120 °C. Maximum temperature for short term exposure is 160 °C.</p> <p>BENEFITS</p> <p>Saves on heavy-duty maintenance Effective EP additive and molybdenum disulfide solid film lubricant protect against component wear under high load conditions and/or shock loading. Rust and corrosion inhibitors protect metal surfaces in wet operating conditions. Good pumpability ensures equipment protection at cold temperatures. High base fluid viscosity aids lubrication at low speeds.</p> <p>Solid film lubrication Molybdenum disulfide component plates out and resists wiping from lubricated surfaces, providing a solid lubricating film that reduces wear and friction.</p> <p>Reduced inventory Multipurpose capability allows use in a wide range of heavy-duty mining and industrial applications, reducing the number of different greases required and reducing product misapplication.</p> <p>Lubrication in dusty or wet conditions Heavy base oil minimises leakage and fling off and provides superior adhesion. Resists water washing and continues to provide effective lubrication in dusty or wet conditions.</p>				

<p>Premium Cotton Picker Grease 1056</p> <p><i>Cotton Picker Grease</i></p> <p>DESCRIPTION Light green, smooth textured grease formulated to provide protection from wear, rust and corrosion as well as ensuring freedom from sticky, water soluble deposits. An extreme pressure additive helps reduce sliding wear throughout the mechanisms of the cotton picker.</p> <p>Pack size: 175 kg..</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Picker spindles, picker bars and chassis bearings of Case, IHC and John Deere mechanical cotton pickers. <p>Usable temperature range in continuous service is -30 to 100 °C.</p> <p>BENEFITS</p> <p>Low consumption Consistency provides full lubrication, while reducing wastage.</p> <p>Less cotton stain Grease does not leak or splash on cotton.</p>	<p>Corrosion resistance Prevents corrosion due to its good metal surface adhesion, resists corrosive action of plant juices and leaves a protective coating when pickers are not in use. It is specially inhibited to resist corrosion of copper and brass. Resists water washing therefore protecting the bearings from moisture and corrosion.</p> <p>Longer component life Reduces wear, providing longer life for bearings and spindle gears.</p> <p>Low starting resistance Ensures low starting resistance in colder weather and correct picker speed operation, as good penetration into bearings is provided by the use of a low viscosity base oil, allowing the picker to start easily with minimum wear and permitting high speed operation even at low ambient temperatures.</p> <p>PERFORMANCE STANDARDS</p> <table> <tr> <td>Jl Case</td> <td>B-27</td> </tr> <tr> <td>John Deere</td> <td>JD 305, JD 360</td> </tr> </table>	Jl Case	B-27	John Deere	JD 305, JD 360
Jl Case	B-27				
John Deere	JD 305, JD 360				
<p>Spray Grease 1100</p> <p><i>Aerosol Specialty Grease</i></p> <p>DESCRIPTION Specially formulated lithium soap based grease available only in an aerosol pressure packs. It dries to a NLGI 2 grade after application.</p> <p>Pack size: 350g aerosol.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Marine and industrial applications where access is difficult. • Where protection from rust and corrosion is essential, such as shackles, blocks, slides, hinges and turnbuckles 	<p>BENEFITS</p> <p>Protects equipment Special additive package provides rust and corrosion resistance, especially in a salt water environment. Grease formulation provides good resistance to water washout. Exhibits good mechanical and shear stability.</p> <p>Easy application Aerosol form aids application in difficult to reach locations.</p>				
<p>TM Gear Lube Premium 1075</p> <p><i>Traction Motor Gear Lubricant</i></p> <p>DESCRIPTION Black, adhesive, semi-fluid grease specifically designed for lubrication of traction motor gear cases of diesel-electric locomotives. Contains a lithium thickener, very high viscosity base fluid and special EP additive system</p> <p>Pack size: 450g bag.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Traction motor gear cases (incorporating appropriate seal designs) where semi-fluid grease-type lubricants are specified. • Older non-sealed traction motor designs that normally use heavy residual-type gear lubricants, where the higher leakage rate that may result is acceptable. • Slow to medium speed industrial gear applications where an EP semi-fluid grease is recommended 	<p>BENEFITS</p> <p>Minimises downtime High film strength and EP additive package protects heavily loaded gears from wear and scuffing. Good low temperature fluidity ensures that effective lubrication is maintained under cold start-up conditions.</p> <p>Long service life Excellent oxidation resistance minimises thickening in high temperature service, while high base oil viscosity and adhesiveness reduce the tendency to leak from the gear case.</p> <p>Enhanced equipment protection Effective corrosion inhibitors protect gear components from rusting in wet conditions.</p> <p>PERFORMANCE STANDARDS</p> <table> <tr> <td>General Motors</td> <td>EMD Specification EMS 1045.</td> </tr> </table>	General Motors	EMD Specification EMS 1045.		
General Motors	EMD Specification EMS 1045.				

Food Machinery Grease

1086

Food Machinery Grease

DESCRIPTION

Multipurpose, extreme pressure, premium quality NLGI No. 2 grease for lubrication of food machinery and canning equipment, especially where incidental contact with food may occur. Pure white, odourless and tasteless. Manufactured from pharmacopoeia grade white mineral oil with a special aluminium complex thickener and contains rust and oxidation inhibitors and extreme pressure additives. All ingredients meet Section 178-3570 of the US Food and Drug Administration regulations and it is approved by AQIS as a Lubricant Type A - for use wherever food or food products may be subject to incidental contact with the lubricant.

Pack sizes: 20kg.

APPLICATIONS

- Machinery and equipment used in producing, manufacturing, packaging, processing, preparing, treating, transporting or holding food.
 - Plain and anti-friction bearings, slides, guides and other moving parts.
- Usable temperature range in continuous service is -30 to 160 °C.
Maximum temperature for short term exposure is 210 °C.

BENEFITS

No effect on food

Should incidental food contact occur, the grease will not affect the colour, odour or taste of the food product.

Protects Equipment

Protects against rust and corrosion, especially bearings and other moving parts subjected to wet conditions (high humidity, water washing, steam, etc). It also protects during machine downtime. Resists water washout and provides a seal against the entrance of water, and fruit and vegetable juices into bearings.

Rationalisation

Offers the safety and convenience of serving all grease points in the plant due to its high load carrying capacity and multipurpose characteristics. May be used in equipment not associated with food and as such represents an excellent grease for rationalisation.

High mechanical and chemical stability

Compatible with and maintains its consistency in the presence of beverages and food juices. Resists oxidation and has high chemical and mechanical stability. Shear stable and maintains consistency when worked in bearings.

PERFORMANCE STANDARDS

USA	USFDA: Approved Type H-1 Grease. Ingredients meet requirements of Section 178-3570 US Dept of Agriculture: Accepted for inspected meat and poultry processing plants.
Australia	Department of Primary Industries and Energy, Australian Quarantine & Inspection Service: Approved Lubricant Type A

GREASE CALCIUM AND CALCIUM COMPLEX

<p>Grease 904 1066</p> <p><i>Railroad Specialty Grease</i></p> <p>DESCRIPTION Smooth, black railroad track grease designed to reduce friction and wear between curved steel rails and railcar wheels. Contains a water-stabilised calcium thickener and 12 mass percent graphite. It resists water washing and has good antiwear properties. It is an NLGI grade 1 consistency and blue-black in appearance.</p> <p>Pack size: 20kg.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Trackside (wayside) lubricators for curved rail sections. Generally applied by an automatic lubricator located at the side of the rail such that the wheel flange picks up the grease and spreads it on the side of the rail. Feeds easily through automatic lubricators and has good "carry" on long curves to ensure against metal-to-metal contact. This assists in reducing wear on locomotive and rail-car wheels, as well as the rail itself, and greatly reduces the noise generally associated with curved rail layouts. • Industrial applications requiring a water-resistant, high graphite content grease of this consistency and oil viscosity (such as worm, pinion and spur gear drives of stokers and for air brake cylinders), and where temperatures do not exceed 80 °C. 	<ul style="list-style-type: none"> • Construction equipment where grease of this consistency and oil viscosity is recommended. • Automotive applications where a graphite grease is required such as brake cables, springs, door handles and locks. <p>Usable temperature range in continuous service is -25 to 80 °C.</p> <p>BENEFITS</p> <p>Saves on maintenance High level of solid graphite lubricant protects rails and wheel flanges from wear.</p> <p>Controls running costs Pumps easily and is readily spread along the side of the rail by the wheel flanges to provide economical coverage. Superior water resistance ensures continuing effective lubrication.</p> <p>Reduces noise Excellent lubricity characteristics of solid graphite minimises noisy metal-to-metal contact between curved rails and rolling wheel flanges.</p> <p>PERFORMANCE CHARACTERISTICS Suitable for use in track lubricators manufactured by Portec Ltd (P&M) and Exors of James Mills Ltd (Hurcol).</p>
<p>Texclad® 2 1072</p> <p><i>Specialty Industrial Grease</i></p> <p>DESCRIPTION Heavy duty, NLGI grade 2, adhesive open gear grease based on a water-stabilised calcium thickener and high viscosity mineral oils, fortified with graphite and molybdenum disulfide. Smooth and buttery texture, black in colour.</p> <p>Pack size: 180kg, 20kg.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Exposed gears in construction, mining and industrial equipment • Dipper sticks on excavating shovels • Automotive fifth wheels (tractor-trailer turntables) • Steel girth gears (girth tires) on rotary kilns and crushing mills • Sugar mill plain bearings, when fluid lubricants tend to leak • Underwater dredging buckets • Jacking legs on offshore drilling rigs • Marine wire ropes 	<p>Usable temperature range in continuous service is -10 to 80 °C. (May be used at much higher temperatures where the carrier grease is thermally decomposed, leaving the solid mineral additives to afford lubrication.)</p> <p>BENEFITS</p> <p>Reduces running costs Good adhesive properties and excellent resistance to water wash out minimise loss of lubricant in service. Resistance to flaking at low temperatures maintains surface protection.</p> <p>Saves on maintenance High load-carrying capacity and anti-wear additives extend gear tooth life in heavy duty service.</p> <p>Protects equipment in severe conditions Graphite and molybdenum disulfide provide solid-film protection in event of loss or degradation of the fluid lubricant.</p>
<p>Texando® FO 20 EP 1071</p> <p><i>Specialty Industrial Grease</i></p> <p>DESCRIPTION Premium, heavy duty NLGI grade 2 industrial bearing grease suitable for use over a wide temperature range, containing calcium complex thickener, ISO 100 mineral oil, high temperature antioxidants and corrosion inhibitors. Yellow-brown in colour with a smooth, tacky texture.</p> <p>Pack size: 180kg.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Plain and anti-friction bearings in high temperature industrial applications • Rolling and casting machinery in steel and other metals manufacturing • Rotary cement kiln shafts • Extrusion presses, calendars and other rolling equipment in rubber, plastics and paper manufacturing • Other industrial applications where equipment may be subject to high temperatures, heavy loads and/or water wash out • Washing and pressing machines in commercial laundries • Suitable for centralised lubrication systems 	<p>Usable temperature range in continuous service is -30 to 145 °C. Maximum temperature for short term exposure is 250 °C.</p> <p>BENEFITS</p> <p>Minimises downtime Very high dropping point reduces leakage from bearings at elevated temperatures. Tacky calcium complex thickener resists wash out even under conditions of mildly acidic or alkaline boiling water.</p> <p>Reduces running costs Superior thermal and oxidative stability extends grease service life.</p> <p>Saves on maintenance EP additive protects against bearing wear in heavily loaded conditions. Effective rust and corrosion inhibitors protect bearing surfaces, even in conditions of severe water exposure.</p> <p>Simplifies inventory Multipurpose suitability over wide temperature range permits use in many industrial applications, reducing the number of different greases required.</p>

<p>Anti-Seize Grease 3056</p> <p><i>Anti-seize Compound</i></p> <p>DESCRIPTION Formulated with a high content of selected solid lubricants for the lubrication and protection of metal to metal parts. The synergistic mixture of solid particles gives the product good performance as an anti-seize compound impeding wear, welding and thus allowing easy assembly and disassembly of parts. In addition, it contains extreme pressure, antiwear, and anti oxidation additives that assist in providing protection in highly corrosive environments and in high temperature conditions. It protects assemblies exposed to extreme temperatures (to 900°C).</p> <p>Pack size: 20kg, 500g, 450g.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • As an anti-seize compound/lubricant in areas where high temperatures, high torque, high pressure, sealing or corrosion present a problem. Such areas include the mining, exploration, industrial, marine, automotive and transportation fields and also domestic and handyman applications. 	<ul style="list-style-type: none"> • As a gasket coating and thread lubricant for industrial boiler, oven and furnace fittings, valves and flanges. Similarly for automotive cylinder head gaskets, exhaust manifold threads, exhaust system joints and other applications where very high temperatures are encountered. • As an anti-seize lubricant for drill collars, tool joints and wire line dressing in the mineral and oil exploration fields. • As a lubricant/corrosion preventive in areas of acidic or salt attack such as threads around acid baths in plating works, sulfuric acid plants and timber processing plants where acetic acid in wood sap is particularly corrosive. • For numerous domestic and handyman applications such as wood screws, nuts and bolts, hinges exposed to weather, heating stove fittings, etc. • As a lubricant for feed screws, adjusting screws, brake linkages, drive chains etc, particularly on earthmoving equipment and in similar applications. <p>Useable temperature range in continuous service is -25 to 130°C. May be used at much higher temperatures (up to 900°C) where the carrier grease is decomposed, leaving the solid additives to afford lubrication.</p> <p>BENEFITS Protection under highly adverse conditions. Provides anti-seize protection up to 900°C. Acts as a lubricant/corrosion preventative in areas of acidic or salt attack.</p>
<p>Multipurpose Grease Green 2998</p> <p><i>Bentone Non-melt Grease</i></p> <p>DESCRIPTION Non-melting grease formulated from a highly refined ISO 460 mineral base oil and an organoclay (bentonite) thickener with effective oxidation resistance for high temperature applications</p> <p>Pack size: 180kg, 20kg, 450g.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Automotive and industrial use especially where high temperatures are encountered. • Automotive wheel bearings. • Industrial ball and roller bearings in high temperature applications. • Exhaust fan bearings. • Furnace door bearings. • Kiln car wheel bearings. • Roll neck bearings. 	<ul style="list-style-type: none"> • High temperature conveyor bearings. • Rotary kiln bearings. <p>Usable temperature range for continuous service is -20 to 135 °C. Maximum temperature with frequent relubrication is 260 °C.</p> <p>This product must not be mixed with any grease other than similar bentonite clay based products.</p> <p>BENEFITS Minimises equipment failure The special non-melting organoclay thickener prevents grease loss from bearings at high temperature.</p> <p>Wide temperature range May be used in applications up to 135 °C with normal re-greasing, and up to 260 °C with very frequent re-greasing, making it suitable for use in a wide range of high temperature applications.</p> <p>Prevents failure in wet conditions Organoclay thickener gives excellent resistance to water washout.</p>

SRI Grease NLGI 2

1055

High Temperature Ball & Roller Bearing Grease

DESCRIPTION

Specially formulated NLGI grade 2 grease containing a highly refined paraffinic base oil, synthetic polyurea ashless organic thickener and high performance rust and oxidation inhibitors, for the lubrication of anti-friction ball, needle and roller bearings operating at speeds up to and above 10,000 rpm, operating at higher temperatures, or where water or salt water may penetrate bearings.

Pack size: 180kg, 20kg, 450g.

APPLICATIONS

- High speed bearings operating under high or low temperature conditions
- Unsealed bearings where there is the likelihood of fresh or salt water getting into the bearings
- Sealed-for-life bearings
- Industrial ball and roller bearings
- Electric motor, fan and air-conditioning unit bearings
- Automotive alternator, generator and starter motor bearings
- Water pump bearings
- Boat trailer wheel bearings

Usable temperature range in continuous service is -30 to 150 °C.
Maximum temperature for short term exposure is 175 °C.

BENEFITS

Longer service life at high temperatures

Synthetic polyurea thickener is very oxidatively stable at elevated temperatures, and being ashless, does not catalyze oxidation as do soap thickeners. This, coupled with its high dropping point and the highly refined base oil and high performance anti-oxidant components, enables operation for extended periods at high temperatures.

Longer bearing life under all conditions

Special rust and corrosion inhibitors provide protection to metal surfaces in wet conditions, even in a salt water environment. Outstanding oxidation stability prevents the formation of corrosive oxidation by-products.

Superior resistance to water washout

Synthetic polyurea thickener has excellent inherent water resistance.

Wide application range

Wide temperature range capability and excellent water resistance allows use in a wide variety of operating conditions.

Typical Characteristics

Product	NLGI Grade	Code	Thickener Type	Colour	Pen. Worked	Drop Point °C	Operating Temp °C	Base Oil Vis. cSt @ 40 °C	Timken OK Load kg	Additives ³
Anti-Seize Grease	2	3056	Bentone	Dk Grey		>270	-25 to 130 ⁴	520	-	Anti-seize
Delo Grease EP2	2	2909	Lithium Complex	Blue	280	>230	-40 to 177	202	30	EP
EP Grease C 000	000	1082	Lithium	Brown	460	Semi-Fluid	-30 to 60	153	25	EP
EP Grease C 00	00	1081	Lithium	Brown	415	Semi-Fluid	-30 to 70	153	25	EP
EP Grease C 0	0	1080	Lithium	Brown	370	180	-30 to 100	153	25	EP
EP Grease C 1	1	1083	Lithium	Brown	325	188	-30 to 130	153	25	EP
EP Grease C 2	2	1084	Lithium	Brown	280	188	-30 to 130	153	25	EP
EP Grease C 3	3	1085	Lithium	Brown	235	188	-20 to 130	153	25	EP
Food Machinery Grease	2	1086	Alumin.Complex	White	280	265	-30 to 160	220	18	EP
Grease 904	"1.5"	1066	Calcium	Grey/Black	310	100	-25 to 80	68	-	Graphite
Liplex EP2	2	1090	Lithium Complex	Blue/Green	280	265	-25 to 140	185	16	EP
Liplex Heavy Duty 2	2	3043	Lithium Complex	Brown	280	> 230	-15 to 130	680	>18	EP
Miltex EP 15001 LX	1	2872	Lithium Complex	Black	325	> 232	-20 to 130	1550	27.2	Moly, EP
Mine Grease Premium	2	3021	Lithium Complex	Black	280	> 220	-20 to 130	580	29.5	Moly, EP
Molygrease EP2	2	1093	Lithium	Black	280	188	-30 to 130	153	25	Moly, EP
Molygrease Heavy	2	1094	Lithium	Black	280	188	-20 to 120	430	25	Moly, EP
Multi-purpose Grease Green	2	2998	Bentone	Green	280	Non-Melt	-20 to 135 ²	460	-	-
Premium Cotton Picker Grease	00	1056	Lithium	L. Green	415	Semi-Fluid	-30 to 100	23	-	EP
Spray Grease ¹	2	1100	Lithium	Brown	280	182	-30 to 130	153	-	EP
SRI Grease NLGI 2	2	1055	Polyurea	Blue/Green	280	243	-30 to 150	116	-	-
Texando FO 20 EP	2	1071	Calcium Complex	Yellow/Brown	280	280	-30 to 145	100	20	EP
Texclad 2	2	1072	Calcium	Black	280	100	-10 to 80	820	-	Graphite
TM Gearlube Premium	-	1075	Lithium	Black	-	Semi-Fluid	-5 to 100	367	18	EP
Ultra-Duty Grease 1	1	1076	Lithium	Red	325	174	-20 to 140	334	32	EP, Tack
Ultra-Duty Grease 2	2	1077	Lithium	Red	280	180	-10 to 140	380	32	EP, Tack

¹ Spray Grease without solvent or aerosol propellant
² Up to 250° with frequent re-lubrication

³ Most greases also contain rust and oxidation inhibitors

⁴ May be used up to 900°C where carrier grease is decomposed, leaving solid additives to afford lubrication

CLEANERS DEGREASERS

Degreasers are specifically formulated to have minimum possible adverse effects on operators. However, as with all petroleum solvents, care should be taken not to inhale the spray or vapour and skin contact should be avoided as much as possible. The use by operators of a reputable brand of barrier cream or of protective gloves is recommended. Degreasers should be employed only in a well ventilated area and away from naked flames. The emulsifiers are biodegradable. However the grease, dirt and solvent are not. Attention must be paid to local, State and other ordinances, rules and regulations governing the discharge of effluent into sewers and waterways. It may be necessary to treat the effluent material before discharge.

Kwik-D-Grease

1439

Aerosol Degreaser

DESCRIPTION

A high quality aerosol degreaser manufactured from high power petroleum solvents combined with a selected biodegradable emulsifier system for quick, efficient operation. It has an extremely low flashpoint (-60°C) due to the propellant gas.

Pack size: 400g aerosol.

APPLICATIONS

- Rapid cleaning and removal of grease and oily residues from tools, machinery, engine parts, chassis, motor bikes, chain saws etc.

• Not to be used for bath or dipping type cleaning methods or for cleaning bitumen roads, paths or driveways.

BENEFITS

High solvent power

Ensures that oil and grease is removed from tools, machinery and floors. Where oily/greasy residues have accumulated and aged over long periods of time, more than one application may be necessary.

Washes off readily

After the degreaser has dissolved the oil or grease from a surface, it may be removed by swabbing or hosing with cold water.

Not harmful to paintwork

Painted surfaces are not damaged provided the degreaser is not permitted to be in contact with the surface longer than is necessary to dissolve grease and dirt, and is washed away promptly.

WARNING

Kwik-D-Grease is a Packaging Group III Flammable Liquid. Care in use and handling must be exercised in accordance with the SAA flammable and combustible liquids code AS1940-1993.

Safe-D-Grease

1618

High Flash Degreaser

DESCRIPTION

A high quality soluble degreaser which emulsifies rapidly for quick removal with water. It is manufactured from a high power solvent combined with a selected biodegradable emulsifier system for quick, efficient operation. Undyed, with a flashpoint of more than 61 °C.

Pack size: 205L, 20L.

APPLICATIONS

- Cleaning and removal of grease and oily residues from tools, machinery, engines, concrete paving and floors.
- Recommended when bath or sink type cleaning methods are used.

Not to be used for cleaning bitumen roads, paths or driveways.

The method of application depends on the size and number of the articles being cleaned. Tools and small parts can be soaked in a container or sink, while machines or large floor areas may be cleaned by applying the oil through spraying, brushing or swabbing.

BENEFITS

High solvent power

Ensures that oil and grease is removed from tools, machinery and floors. Where oily/greasy residues have accumulated and aged over long periods of time, more than one application may be necessary.

Washes off readily

After the degreaser has dissolved the oil or grease from a surface, it may be removed by swabbing or hosing with cold water.

Does not harm paintwork

Painted surfaces are not damaged provided the degreaser is not permitted to be in contact with the surface longer than is necessary to dissolve grease and dirt, and is washed away promptly.

Safer application

Based on high flash point solvent for safer application.

WARNING

Safe-D-Grease is a Class C1 Combustible Liquid. Care in use and handling must be exercised in accordance with the SAA flammable and combustible liquids code AS1940-1993.

Safe-D-Grease QB

2620

Quick Break High Flash Degreaser

DESCRIPTION

A high quality, water soluble degreaser which emulsifies rapidly for quick removal with water. It is a rapid quick break degreaser manufactured from a high power solvent combined with a selected biodegradable emulsifier system for quick, efficient operation and is ideal for use with waste recovery systems where separators or oil skimmers are installed. Red in colour with a flashpoint of more than 65 °C.

Pack size: 205L, 20L.

APPLICATIONS

- Cleaning and removal of grease and oily residues from tools, machinery, engines, concrete paving and floors.

Not to be used for bath or dipping type cleaning methods, due to the quick break technology used

Not to be used for cleaning bitumen roads, paths or driveways.

BENEFITS

High solvent power

Ensures that oil and grease is removed from tools, machinery and floors. Where oily/greasy residues have accumulated and aged over long periods of time, more than one application may be necessary.

Washes off readily

After the degreaser has dissolved the oil or grease from a surface, it may be removed by swabbing or hosing with cold water.

Does not harm painted surfaces

Painted surfaces are not damaged provided the degreaser is not permitted to be in contact with the surface longer than is necessary to dissolve grease and dirt, and is washed away promptly.

Safer application

Based on high flash point solvent for safer application.

Compatible with skimmers

Ideal for use with waste recovery systems where separators or oil skimmers are installed.

WARNING

Safe-D-Grease QB is a Combustible Liquid. Care in use and handling must be exercised in accordance with the SAA flammable and combustible liquids code AS1940-1993.

CLEANERS DEGREASERS

Typical Characteristics

Product	Colour	CODE	Density @ 15 °C kg/L	PMCC Flash Point °C
Kwik-D-Grease Aerosol	Slightly coloured	1439	0.76 to 0.79	-60 (gas)
Safe-D-Grease	Colourless	1618	0.83	>61
Safe-D-Grease QB	Red	2620	0.83	>61

ToughWash

2949

Heavy-duty Industrial Detergent

DESCRIPTION

Heavy-duty, quick-break, multipurpose industrial detergent degreaser specially formulated with a blend of synthetic wetting agents, alkaline detergents and water soluble solvents to provide superior removal of tough stains from a wide range of surfaces and equipment. Coloured Red.

Pack size: 200L, 20L.

APPLICATIONS

- Agricultural equipment
- Engines and other vehicular components
- Industrial equipment
- Mining, quarrying and earthmoving equipment
- Mobile and stationary equipment
- Transport fleets
- Waste management
- Concrete floors
- Plastic, painted, baked enamel, stainless steel, laminated & other similar inert surfaces
- Walls & tiles.

Not suitable for use on sensitive surfaces such as aluminium, zinc and tin.

BENEFITS

Lowers operating costs

Quick Break technology facilitates the separation and trapping of effluent at interceptors and settling tanks, minimising the amount of contaminated waste produced which requires costly disposal. Multipurpose properties allow use in a wide range of cleaning applications and equipment and minimise inventory.

Reduces inventory costs

Multipurpose properties allow use in a wide range of cleaning applications and equipment and reduce the chance of problems arising through the use of inappropriate cleaning products and methods.

Lessens environmental impact

Synthetic wetting agents, surfactants and water soluble solvents are biodegradable, minimising environmental damage from leakage and disposal.

DIRECTIONS FOR USE

ToughWash can be used at a range of dilutions to suit the nature and severity of the surfaces to be cleaned.

As a general guide:

Recommended Applications	Manual Washing	High Pressure Sprayer	Foamer * Dry/Wet
General cleaning- walls, floors, benches	1:100	1:100	
Mining and agricultural plant and equipment	1:50	1:80	1:40/1:80
Spray on/ wipe off spot cleaning (hard surfaces)	1:10 to 1:20		
Workshop floor and undercarriage degreasing	1:5 to 1:40	1:80	
Degreasing engine parts	1:5 to 1:10	1:50	

* Use "dry" when foam is required to stick for longer retention time, especially on vertical or overhanging surfaces. Caltex recommends that air induced foamers are used when "dry" foam is required.

ToughWash Ultra

2617

Heavy-duty Industrial Cleaner

DESCRIPTION

A foaming solvent detergent complex formulated for the removal of soils, light oils and greases from vehicles, heavy equipment and workshop floors in the transport and mining industries. Coloured green.

Pack sizes: Bulk only

APPLICATIONS

- Vehicles.
- Heavy equipment.
- Workshop floors.

BENEFITS

Reduces inventory costs

Multipurpose properties allow use on heavy equipment and workshop floors minimising inventory.

Reduces equipment repair

Safe to use on painted surfaces, glass, rubber and normal vehicle components but may cause aluminium and its alloys to become dull.

Effective formulation

May be applied as a foam to prolong contact time on vertical surfaces. Works well in hard water. Specially formulated to remove coal based road grime without rubbing or brushing.

DIRECTIONS FOR USE

ToughWash Ultra may be applied by hand, brushed or swabbed onto the surface to be cleaned; however, it is recommended that it be applied as a wet foam using an auto mix detergent application system. After cleaning, rinse surfaces with water.

CLEANERS DETERGENTS

TruckWash

2948

Automobile Detergent

DESCRIPTION

TruckWash is an economical, heavy duty, solvent free detergent for cleaning vehicles and equipment without damaging paint work. It emulsifies instantly to remove dirt, mud, oil film, grime and insects. It is biodegradable and is dyed blue.

Pack size: 200L, 20L, 4L.

APPLICATIONS

- Cleaning of heavily soiled vehicles and equipment used in road transport and other heavy industries, especially where hard to move substances such as coal dust, insects and road grime may be a problem.
- Cleaning passenger cars, light commercials etc.

BENEFITS

Lowers operating costs

Multipurpose properties allow use on a wide range of equipment cleaning applications, minimising inventory.

Lessens environmental impact

Biodegradable components reduce environmental damage from leakage and disposal.

Reduces equipment repair

Solvent free formulation prevents damage to sealing rubbers, plastic mouldings, paintwork and adhesive decals, but may cause aluminium and its alloys to become dull.

Increases operator health and safety

Mild pH and solvent free formulation reduces risk of reaction with sensitive skin.

DIRECTIONS FOR USE

Recommended Applications	Manual Washing	High Pressure Sprayer	Foamer * Dry/Wet
Trucks, buses and heavy vehicle washing	1:80	1:100	1:40/1:80
Cars and light commercial vehicle washing	1:100	1:100	1:40/1:80
General cleaning- walls, floors, benches	1:100	1:100	
Mining and agricultural plant and equipment	1:50	1:80	1:40/1:80
Workshop floor and undercarriage degreasing	1:5 to 1:40	1:80	

* Use "dry" when foam is required to stick for longer retention time, especially on vertical or overhanging surfaces. Caltex recommends that air induced foamers are used when "dry" foam is required.

Typical Characteristics

Product	Colour	CODE	Density @ 15 °C kg/L	pH
ToughWash	Red	2949	1.06	10 - 11
ToughWash Ultra	Green	2617	1.0	~ 10
TruckWash	Blue	2948	1.0	7.5 – 8.5

CLEANERS HAND CLEANERS

<p>Handolin 1088 <i>Hand Cleaner</i></p> <p>DESCRIPTION Water soluble solvent based, cream hand cleaner designed to remove dirt, grease and grime from hands and at the same time soothe skin ailments caused by bacteria and dirt. Handolin consists of a balanced blend of solvents, emulsifiers and soaps with lanolin esters and agents to assist in controlling dermatitis and skin infections. It meets the strictest cleaning and hygiene standards. Easy to use and has a mild pleasant perfume.</p> <p>Pack size: 20kg, 2.5kg.</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Removal of grease, ingrained metal dust, dirt, undried paint, carbon, oil, printers ink, bitumen, tar and other contaminants from the skin. • Restoration of vinyl furniture and vinyl vehicle upholstery which has become dull through ingrained dirt. • Cleaning hard surfaces such as floors and wall tiles, working surfaces, paintwork and bare metal. 	<p>BENEFITS Safe and economical Prevents dry hands and assists in healing cuts and scratches. Leaves no residual odour. Non-drip, no wastage.</p> <p>DIRECTIONS FOR USE Hands Apply a small quantity of Handolin into the palm of the hand, rub in well with special emphasis on skin crevices and fingernails. Rinse off with water (including salt water) or wipe clean with a cloth or paper towel.</p> <p>Vinyl Apply using a dry cloth and rub well into the upholstery. Wipe off with a clean damp cloth or paper towel.</p> <p>Hard Surfaces Apply using a dry cloth and then wash or wipe off with a wet or dry cloth or paper towel.</p>
<p>HandWash 3051 <i>Hand Cleaner</i></p> <p>DESCRIPTION Hand cleanser containing natural citrus based solvent and polymer beads. It is petroleum solvent free and does not contain ammonia, alkalis or harsh chemicals which may cause skin damage.</p> <p>Pack size: 20L, 4L. (Pump kits available for each size).</p> <p>APPLICATIONS</p> <ul style="list-style-type: none"> • Abattoirs • Assembly plants • Carwash and valet facilities • Furniture and woodworking factories • Mobile repair vehicles • Office washrooms • Printing plants • Trucks and other transport equipment • Tyre fitting workshops • Tyre manufacturing factories • Workshops 	<p>BENEFITS Lowers operating costs Cleans hands thoroughly and reduces volume of hand cleaner used. Free rinsing reduces need for additional washing.</p> <p>Increases operator health and safety Formulation free of harsh chemicals to avoid skin irritation due to use.</p> <p>Lessens environmental impact Biodegradable components minimise damage to the environment from leakage and disposal.</p> <p>DIRECTIONS FOR USE Apply a small quantity to into the palm of the hand, rub in well with special emphasis on skin crevices and fingernails. Rinse off with water or wipe clean with a cloth or paper towel..</p>

CLEANERS SPILL ABSORBENTS

Enretech is a range of products designed for the absorption and remediation of oil and fuel spills. They are manufactured from recycled cellulose waste from the cotton industry (cotton linters) and are 100% biodegradable, non-carcinogenic, non-toxic and non-volatile. These products totally encapsulate the spill and contain naturally occurring micro-organisms which biodegrade the absorbed hydrocarbons into their non-harmful constituent parts. Spent absorbents may be safely disposed of as compost or land fill.

Enretech-1

3008

DESCRIPTION

A site remediation product which acts as a dual purpose oil/fuel absorbent and bioremediation agent. For use on direct spills or on hydrocarbon contaminated soil. It is applied by blending the dry absorbent with the contaminated soil as evenly as possible and dispersed by tilling. Enretech-1 will also absorb up to six times its own weight in oil based product and bioremediation takes place in situ. There is no requirement for washing or milling. The encapsulated oil will not leak into ground waters or migrate to water ways. Enretech-1 will not biodegrade itself until all of the encapsulated hydrocarbons have been bioremediated..

Pack size: 10kg bag.

Enretech Cellusorb

2759

DESCRIPTION

An oil and fuel absorbent for use on water, which readily attaches itself to hydrocarbons even if partially emulsified or dissolved. It will absorb up to 18 times its own weight in oil based products and can be used in harbours, docks, wharves, marinas, refuelling depots, beaches, bird sanctuaries, reefs and mangrove areas or wherever an oil spill might occur or could wash ashore. It can be spread over the spill surface from the side of vessels, used in high pressure blowers or deployed from low flying aircraft. Wind and wave action assists its ability to wick up hydrocarbons and it can be retrieved by skimming or the use of a net. It is environmentally inert posing no danger to fauna, flora or aquatic life making it ideally suited to sensitive ecosystems. If a spill has been washed ashore it is recommended that Enretech-1 be spread over the surface of any rocks or sand that are oil covered.

Pack size: 10kg bag.

Enretech Floor Sweep 10kg, 5kg

2690, 2689

DESCRIPTION

An oil and fuel absorbent that uses capillary absorbent technology, designed for hard surfaces in the industrial, commercial and automotive markets such as highways and factory, laboratory and workshop floors. It can be used on animal, vegetable, mineral and synthetic oils along with blood, urine and vomit and can absorb up to six times its weight of liquid. It is applied by spreading over the surface and sweeping back and forth until the surface is dry. The absorbent is then swept aside leaving the surface clean and dry with no surface slick. No secondary detergent or solvent washes are necessary. The used absorbent may be disposed of as compost or land fill.

Pack size: 10kg bag, 5kg bag.

Enretech Spill Kits

	Depot	Service Station	Transport	Workshop
Code	2676	2623	2536	2537
Description				
Floor Sweep 5 kg bag	3	3	1	3
Sock 1.2m x 10cm	2	2	1	2
Absorbent Pillow	2	2	1	-
Absorbent Wipes	50	50	25	50
Instruction Card (hydrocarbon)	1	1	1	1
Nylon Transport Kit Bag	-	-	1	-
Disposable Overalls	2	-	-	-
Waste Disposal Bags	2	-	-	-
Dustpan & Brush Set	1	1	-	-
Dust Goggles	2	2	-	-
Scoop 500 g Yellow	-	-	-	1
PVC Gloves	2 Pair	2 Pair	-	1 Pair
Caltex Spill Kit Labelling	1	1	-	1
120 L Bin Yellow	-	-	-	1
120 L Bin Red	1	-	-	-
Absorbs oil up to	80 L	80 L	30 L	64 L

FUELS

<p>Vortex® 98</p> <p>Vortex 98 is a specially formulated, Research Octane 98 Premium Unleaded Petrol that is exclusive to Caltex. Vortex 98 has been proven to clean up deposits from an engine's intake and fuel system to provide better all around performance. Vortex 98 meets all requirements of the current Australian Fuel Standard (Petrol) Determination. Vortex 98 is coloured pale yellow. Vortex 98 helps the engine deliver maximum power, better acceleration, enhanced driveability and smoothness.</p>	103
<p>Vortex®</p> <p>Vortex is a specially formulated, Research Octane 95 Premium Unleaded Petrol that is exclusive to Caltex. Vortex has been proven to clean up deposits from your engine's intake and fuel system to provide better all around performance. Vortex meets all requirements of the current Australian Fuel Standard (Petrol) Determination. Vortex is coloured yellow. Vortex helps the engine deliver maximum power, better acceleration, enhanced driveability and smoothness.</p>	102
<p>Unleaded Petrol</p> <p>Unleaded fuel for spark ignition engines blended to meet the requirements of modern automotive engines fitted with catalytic converters. Unleaded petrol provides easy starting, quick warm up and full power under all climatic conditions. It has a research octane rating of 91 minimum, and is coloured purple. It meets all requirements of the current Australian Fuel Standard (Petrol) Determination.</p>	200
<p>E10 Unleaded Petrol</p> <p>E10 Unleaded Petrol is enhanced with 10% ethanol, a renewable non-fossil fuel. It helps reduce greenhouse gas emissions and reliance on fossil fuels. E10 Unleaded Petrol is carefully blended to meet Caltex's strict quality standards so it can be used with confidence. The 10% ethanol content of E10 Unleaded Petrol complies with the limit set under the Australian Government's national fuel standards. E10 Unleaded Petrol is suitable for use in most new and many older cars, utes and vans without affecting the manufacturer's warranty. Where there is uncertainty as to whether ethanol blended petrol is suitable for a particular vehicle, the list on the Federal Chamber of Automotive Industries (FCAI) website should be consulted. E10 Unleaded Petrol should not be used in marine craft, or other equipment without first consulting the manufacturer. Caltex fuels are not recommended for use in petrol fuelled aircraft.</p>	202
<p>Automotive LPG (Autogas)</p> <p>A premium quality, clean burning, liquefied petroleum gas. It is a high octane fuel suitable for all currently available automotive LPG engines or dual fuel LPG/petrol engines. It is composed mainly of propane and butane, with minor amounts of propene and butene and is the cleanest, most inexpensive car fuel on the market.</p>	900
<p>Heating Oil</p> <p>A premium quality heating oil designed to meet the volatility, viscosity and clean burning requirements of vaporising oil burners and domestic space heating equipment. It has a gross energy content of approximately 37.2 MJ/L.</p>	700
<p>Jet A-1</p> <p>A kerosene type aviation turbine fuel for civil, commercial and military aircraft use. Manufacture and distribution are closely controlled to ensure that the product meets or exceeds all requirements of the applicable specifications, including DEF STAN 91-91 and the Joint Fuelling System Checklist.</p>	500
<p>Kerosene</p> <p>A premium quality product for use in all kerosene burning applications. It is suitable for kerosene space heaters with wick or sleeve type burners where it burns cleanly and uniformly with no objectionable odours or deposits. In lamps it gives a bright dependable light with no tendency to flicker. It is coloured pale blue.</p>	600
<p>Vortex Premium Diesel</p> <p>Vortex Premium Diesel has been formulated to clean a diesel car's fuel system while it is driven. Over time, deposits may build up on fuel injectors. The deposits build up slowly, so decreases in engine performance may not be noticed. Deposits reduce combustion efficiency, leading to power loss, slower acceleration, increased fuel consumption and higher exhaust emissions. By removing these deposits, Vortex Premium Diesel helps restore lost power, economy and smoothness. Vortex Premium Diesel is designed for use with new common rail diesel technology and is ideal for the most advanced turbo-diesel engines. Vortex Premium Diesel contains an anti-foam agent that significantly reduces the risk of splashing and reduces the odour that can be left on hands when filling.</p>	422
<p>New Generation Diesel</p> <p>New Generation Diesel is suitable for use in all diesel-fuelled engines in mobile, portable and stationary applications. It is enhanced with 2% biodiesel, which reduces reliance on fossil fuels and helps to support regional and rural Australia. New Generation Diesel is carefully blended to meet Caltex's strict fuel quality standards and the Australian Fuel Standard (Diesel). Biodiesel is made from renewable feedstock, such as canola oil and tallow.</p>	430
<p>Extra Low Sulfur Diesel</p> <p>Designed for use in all diesel-fuelled engines in mobile, portable and stationary applications. It has a maximum Sulfur content of 10 mg/kg. Extra Low Sulfur Diesel has excellent lubricity properties and meets or exceeds the Fuel Injection Equipment Manufacturers recommendation for diesel fuel lubricity. Extra Low Sulfur Diesel meets all requirements of the Australian Fuel Standard (Diesel) Determination for 2009.</p> <p>Note: The colour of Extra Low Sulfur Diesel ranges from water white through to a straw colour with, in some instances, a fluorescent green tinge. The fluorescent green is not cause for concern. It results from the refining process and has no impact on the operability or performance of the fuel.</p>	429

FUELS

Typical Characteristics

Product	Code	Density @15 °C kg/L	Flash Point °C *	Research Octane Number	Cetane Index	Sulfur mg/kg	Colour	Energy	
								MJ/L	MJ/kg
Vortex 98	103	0.76	<ambient	98	-	25	Pale Yellow	32.5	42.8
Vortex	102	0.76	<ambient	95	-	40	Pale Yellow	32.7	43.0
Unleaded Petrol	200	0.74	<ambient	91	-	90	Purple	31.8	43.0
E10 Unleaded Petrol	202	0.745	<ambient	94	-	81	Purple	30.8	41.9
Automotive LPG	900	0.54	<ambient	-	-	-	-	25.7	49.9
Heating Oil	700	0.82	67	-	-	-	-	35.2	43.0
Jet A-1	500	0.80	40	-	-	-	-	34.5	43.3
Kerosene	600	0.80	40	-	-	-	Blue	34.5	43.3
Vortex Premium Diesel	422	0.83	78	-	50	<50	-	35.9	43.3
New Generation Diesel	430	0.83	78	-	51	<50	-	35.8	43.2
Extra Low Sulfur Diesel	429	0.83	78	-	50	<10	-	35.7	43.0

• Pensky-Martens Closed Cup

TYPICAL CHARACTERISTICS

Engine Oils

Product	SAE Grade	CODE	API	ACEA	Density @ 15 °C kg/L	Pour Point °C	Flash Point °C *	Viscosity cSt @		VI	BN mgKOH/g D2896	Sulfated Ash %m
								40 °C	100 °C			
Delo 1000 Marine 30	30	1294	-	-	0.893	-21	>220	96	11.0	99	12	1.6
Delo 1000 Marine 40	40	1295	-	-	0.898	-18	>220	137	14.0	99	12	1.6
Delo 400 LE	15W-40	3006	CJ-4	E7-04	0.886	-30	204	125	15.7	131	9.6	1.0
Delo 400 Multigrade	15W-40	2696	CI-4+	E7-04	0.886	-33	230	125	15.1	125	12.2	1.4
Delo 6130 CFO 20W-40	20W-40	2852	-	-	0.893	-15	>220	132	15.0	116	13	1.5
Delo 6130 CFO 40	40	2982	-	-	0.897	-15	>220	144	14.7	101	13	1.5
Delo Gold Multigrade	15W-40	2894	CH-4	E3-96	0.889	-27	220	115	15.1	137	9.5	1.3
Delo Gold Plus	15W-40	3052	CI-4	E7	0.89	< -24	>215	113	15.1	139	10.1	1.4
Delo HDD 40	40	1796	CF-2	-	0.903	-18	230	142	14.4	99	6.0	0.8
Delo HDD 50	50	1797	CF-2	-	0.900	-12	240	219	19.1	98	6.0	0.8
Delo Silver 10W	10W	2896	-	-	0.886	-33	210	41.9	6.5	105	10.2	1.4
Delo Silver 30	30	2897	CF	-	0.904	-21	225	102	11.5	98	10.2	1.4
Delo Silver 40	40	2898	CF	-	0.909	-18	230	142	14.4	97	10.2	1.4
Delo Silver Multigrade	15W-40	2895	CG-4	E2	0.889	-27	220	115	15.1	137	10.2	1.4
Delo XLD Multigrade	10W-40	2691	CF	E4-99	0.896	-27	220	90	13.8	155	14.1	1.8
Four Stroke Lawnmower Oil	30	2699	SJ/CF	-	0.894	-21	225	102	11.5	100	10.7	1.5
Geotex Ashless	40	2955	-	-	0.89	-18	>225	119	12.7	99	2.2	0.01
Geotex HD	40	3020	CD	-	0.895	-18	>220	126	13.0	96	7.0	0.77
Geotex LA	40	2954	CD	-	0.896	-18	>225	125	13.2	99	5.2	0.49
Geotex LF	40	2952	CD	-	0.899	-15	>225	139	14.0	97	8.0	0.99
Havoline Classic	25W-60	2946	SG/CD	-	0.90	-21	≥220	276	25.0	115	5.3	0.72
Havoline Extra	15W-40	2887	SL/CF	-	0.89	-27	≥215	117	15.1	137	7.1	0.93
Havoline Fully Synthetic	5W-40	3032	SM/CF	C3-04	0.86	-30	205	90	14.5	168	7.9	0.8
Havoline Fully Synthetic C3	5W-30	3042	SM/CF	C3-04	0.852	-36	200	72	12.2	167	7.9	0.8
Havoline LPG	20W-50	2869	SL/CF	-	0.889	-24	≥215	172	19.5	130	7.1	0.93
Havoline Multigrade	20W-50	1459	SG/CD	-	0.89	-24	≥215	167	19.2	130	5.3	0.71
Havoline Premium	20W-50	1320	SL/CF	-	0.889	-24	≥215	172	19.5	130	7.1	0.93
Havoline Premium Plus	10W-30	2967	SM/GF-4	-	0.890	-27	200	77	11.1	133	7.6	0.88
Havoline Super 2T	-	3050	TC	-	0.878	-30	91	64.2	9.8	136	0.13	0.12
Havoline Synthetic Blend	10W-40	3031	SM/CF	A3/B3	0.865	-30	205	99.5	14.5	151	8.0	1.1
Havoline Ultra V	5W-30	3029	VW 504.00 VW 507.00		0.848	-42	230	71	11.5	155	5.8	0.60
HDAX LFG Gas Engine Oil	40	2913	CD	-	0.886	-18	>215	144	15.1	105	6.0	0.7
HDAX Low Ash Gas Engine Oil	40	2916	CF	-	0.881	-18	>225	124	13.5	104	4.2	0.5
HDAX Medium Ash Gas Engine Oil	40	2951	CD	-	0.886	-18	>230	129	13.6	100	6.2	0.7
RPM Gas Engine Oil	15W-40	3046	-	-	0.876	-36	230	115	15	136	5.1	0.55
Super Outboard 3	-	2709	NMMA TC-W3®		0.876	-33	100	44	7.2	125	5.5	<0.01
Super Tractor SAE 15W-40	15W-40	2710	CF-4	-	0.889	-33	220	113	15.1	139	10.1	1.4
Taro 20 DP 30	30	2737	-	-	0.897	-12	>220	97.5	11.0	98	20	2.5
Taro 20 DP 40	40	2734	-	-	0.904	-15	>230	139	14.0	97	20	2.5
Taro 30 DP 30	30	2739	-	-	0.901	-18	>220	96.8	11.1	100	30	3.6
Taro 30 DP 40	40	2738	-	-	0.906	-18	>230	139	14.0	97	30	3.6
Taro 40 XL 40	40	2735	-	-	0.911	-18	>230	139	14.0	97	40	4.8
Taro 50 XL 40	40	2736	-	-	0.918	-18	>230	126	14.0	109	51	6.1
Taro Special HT 70	50	2873	-	-	0.93	-15	>230	220	20.0	105	70	9.0
Taro Special HT LS 40	50	3003	-	-	0.92	-15	>250	247	21.0	100	40	5.1
Two Stroke Lawnmower Oil	-	2701	JASO FB		0.877	-18	91	52	7.5	100	1.3	0.09

TYPICAL CHARACTERISTICS

Product	SAE Grade	CODE	API	ACEA	Density @ 15 °C	Pour Point	Flash Point	Viscosity cSt @		VI	BN mgKOH/g	Sulfated Ash
Veritas 800 Marine	30	1388	-	-	0.89	-9	>220	108	11.9	95	5.4	0.7

* Cleveland Open Cup Flashpoint

Automotive Gear and Transmission Lubricants

Product	SAE Grade		ISO Grade	CODE	Density @ 15 °C kg/L	Pour Point °C	Flash Point °C *	Viscosity cSt @		VI
	Gear	Engine						40 °C	100 °C	
Autotrans Fluid BW	70W	10W	-	1275	0.862	-39	218	38	7.0	149
Delo Gear Lubricant ESI	80W-90	-	-	2876	0.887	-33	210	140	14.2	99
Delo Synthetic Transmission Fluid SAE 50	90	50	-	3038	0.86	< -45	221	132	17.5	146
Delo Synthetic Gear Lubricant SAE 75W-90	75W-90	-	-	3039	0.87	-54	180	106	14.9	146
Delo Synthetic Gear Lubricant SAE 80W-140	80W-140	-	-	3040	0.88	-39	192	275	27.2	130
EasyShift	75W-90	-	-	1418	0.876	-39	>165	95.9	16.4	186
Final Drive SAE 60	60	-	-	2944	0.910	-18	>220	335	25.1	97
Gear Oil LSD 90	90	-	-	1835	0.912	-18	>180	203	18.3	99
Gear Oil LSD 140	140	-	-	2700	0.917	-12	>198	387	27.8	98
Havoline ATF-J	70W	10W	-	2988	0.870	-51	>190	36.9	7.3	165
RPM Borate EP Lube 68	80W	-	68	1344	0.901	-33	> 190	65	8.6	103
RPM Borate EP Lube 150	80W-90	-	150	1340	0.910	-30	> 190	143	14.6	101
RPM Borate EP Lube 220	85W-90	-	220	1341	0.913	-21	> 190	210	18.8	100
RPM Borate EP Lube 320	90	-	320	1342	0.917	-18	> 200	306	23.8	98
RPM Borate EP Lube 460	85W-140	-	460	1343	0.922	-18	> 200	440	30	97
RPM Borate EP Lube 680	-	-	680	1345	0.936	-9	> 200	660	40	99
RPM Borate EP Lube 1200	250	-	"1200"	1339	0.952	-6	> 220	1150	53	92
Super Tractor SAE 15W-40	-	15W-40	-	2710	0.886	-33	>215	113	15.1	139
Synthetic ATF Heavy Duty	70W	10W	-	2915	0.854	-45	228	35.3	7.4	183
Synthetic Gear Lubricant FM 75W-140	75W-140	-	-	3083	0.87	-48	200	190	24	155
Texamatic 1888	70W	10W	-	2940	0.855	-51	190	35.8	7.2	168
Texamatic Type F	70W	10W	-	1356	0.863	-45	185	39	8.1	193
Textran TDH Premium	-	-	-	2069	0.889	-39	>205	57.5	9.5	148
Thuban GL-5 EP 80W-90	80W-90	-	-	2116	0.900	-30	>165	140	15	108
Thuban GL-5 EP 85W-140	85W-140	-	-	2117	0.908	-15	>180	344	26	97
Torque Fluid 414	70W	10W	-	2711	0.880	-39	220	40.8	6.5	110
Torque Fluid 434	80W	30	-	2119	0.903	-30	250	92.6	10.9	102
Torque Fluid 454	90	50	-	2120	0.909	-18	270	224	19.1	96
Torque Fluid 464	140	60	-	2712	0.911	-6	270	317	24.0	96

* Cleveland Open Cup Flashpoint

Coolants

Product	CODE	Density @ 15 °C kg/L	Inhibitor type	Glycol type	Colour	Recommended Treat Rate
Anti-Freeze Anti-Boil Coolant	1268	1.12	Hybrid	Ethylene	Green	50%
Delo Extended Life Coolant Pre-Mixed 50/50	2981	1.07	OAT	Ethylene	Red	100%
Extended Life Coolant	1308	1.11	OAT	Ethylene	Orange	50%
Radiator Protector	2043	1.02	Conventional	-	Green	100%
XL Corrosion Inhibitor Concentrate	1602	1.06	OAT	-	Red	7.5%

OAT: Carboxylate (Organic Acid) Technology.

TYPICAL CHARACTERISTICS

Industrial Lubricants

Product	ISO Grade	CODE	Density @ 15 °C kg/L	Pour Point °C	Flash Point °C	Viscosity cSt @		VI	Timken OK Load kg	FZG Pass Stage
						40 °C	100 °C			
Capella WF 68	68	1291	0.902	-30	198	65	6.7	24	-	-
Cetus DE 100	100	1350	0.959	-31	246	95.5	10.2	85	-	-
Cetus PAO 46	46	1632	0.842	-57	232	46	8.1	136	-	-
Cetus PAO 68	68	1633	0.850	-57	240	68	10.3	141	-	-
Chain & Bar Oil	-	1367	0.892	-12	234	127	-	-	-	-
Chain Bar Premium	-	1518	0.894	-12	230	142	15.0	100	-	-
Compressor Oil EP VDL	100	3055	0.89	-12	246	100	11.0	97	-	-
Compressor Oil EP VDL	150	3054	0.89	-12	256	150	14.6	95	-	-
Concrete Form Oil 424		1522	0.854	-	70	5.2	-	-	-	-
Crater 2	-	1060	0.988	36	284	-	395	-	18	-
Crater 5	-	1062	1.004	-	290	-	1015	-	22	-
Daphne Punch Oil AF-3N	-	2009	0.793	-	-	2.6	-	-	-	-
Drill Flute Grinding Oil	-	1527	0.872	-	190	22	-	-	-	-
Erdol CRA 91		1403	0.850	-	200	2.5	-	-	-	-
Gernol 220X	220	3023	0.890	-3	260	220	19	97	-	-
Gernol 320X	320	1419	0.895	-3	260	320	24.1	96	-	-
Meropa 68	68	1234	0.886	-15	200	68	8.8	101	31.8	12
Meropa 150	150	1229	0.897	-15	215	150	14.9	99	31.8	12
Meropa 220	220	1230	0.901	-15	215	220	19.2	98	34.0	12
Meropa 320	320	1231	0.903	-15	215	320	24.3	97	34.0	12
Meropa 460	460	1233	0.906	-15	285	439	29.8	96	34.0	12
Meropa 680	680	1235	0.917	-12	285	650	36.5	91	34.0	12
Meropa 1000	1000	1228	0.933	-3	285	955	44	85	34.0	12
Meropa 4000	-	2702	0.958	-6	285	3940	108	85	-	-
Meropa Synthetic EP 220	220	3000	0.856	-36	212	220	26.2	152	36	-
Meropa Synthetic EP 320	320	3001	0.859	-36	216	320	35.4	157	36	-
Mould Oil 010	-	1449	0.867	-	70	21	-	-	-	-
Mould Oil 20	-	1450	0.860	-	150	6.8	-	-	-	-
Mould Oil 22	-	1325	0.870	-	70	18.9	-	-	-	-
Mould Oil 275	-	1452	0.846	-	70	3.9	-	-	-	-
Mould Oil 3	-	1453	0.845	-	70	4.0	-	-	-	-
Premium Harvester Hydraulic Oil	(68)	1498	0.882	-33	226	74	12.1	161	-	10
Propar 12	'12'	4914	0.846	-18	190	11.6	2.95	107	-	-
Propar 22	22	4916	0.859	-12	210	21.5	4.28	104	-	-
Propar 32	32	4917	0.868	-9	220	28.1	5.07	107	-	-
Propar 68	68	4919	0.879	-9	234	68.0	8.8	102	-	-
Propar 100	100	4913	0.889	-9	262	89.1	10.5	100	-	-
Propar 320	320	4931	0.900	-6	262	320	24	95	-	-
Propar 460	460	4918	0.906	-9	286	536	33.6	95	-	-
Propar 1800	'1800'	4915	0.949	-3	298	1764	62.9	83	-	-
Pronap 280	'280'	4912	0.928	-9	200	257	18.5	80	-	-
Rando HD 10	10	2703	0.842	-36	150	9.9	2.7	108	-	10
Rando HD 22	22	2046	0.861	-36	190	21	4.2	101	-	10
Rando HD 32	32	2048	0.870	-33	210	30.5	5.3	106	-	10
Rando HD 46	46	2050	0.876	-33	220	44.0	6.7	106	-	10
Rando HD 68	68	2051	0.881	-30	226	65	8.6	104	-	10
Rando HD 100	100	2044	0.887	-21	240	95.5	10.8	97	-	10

TYPICAL CHARACTERISTICS

Product	ISO Grade	CODE	Density @ 15 °C kg/L	Pour Point °C	Flash Point °C	Viscosity cSt @		VI	Timken OK Load kg	FZG Pass Stage
						40 °C	100 °C			
Rando HD 150	150	2045	0.891	-15	250	143	14.3	97	-	10
Rando HD 320	320	2049	0.900	-6	277	320	23.9	95	-	10
Rando HDZ 15	15	1328	0.849	-42	154	16	4.0	155	-	10
Rando HDZ 32	32	1329	0.869	-36	210	34	6.6	154	-	10
Rando HDZ 46	46	1330	0.873	-33	214	44	8.0	154	-	10
Rando HDZ 68	68	1331	0.879	-33	220	65	10.6	153	-	10
Rando HDZ 100	100	2706	0.886	-27	228	100	14.6	152	-	10
Regal EP 32	32	2724	0.855	-30	230	30.6	5.4	111	-	-
Regal Marine 77	"77"	1332	0.883	-9	240	78.4	9.5	98	-	-
Regal R&O 32	32	1334	0.871	-9	212	30.6	5.3	102	-	-
Regal R&O 46	46	1335	0.874	-9	224	44.0	6.6	100	-	-
Regal R&O 68	68	1336	0.875	-9	234	65.0	8.4	98	-	-
Regal R&O 100	100	1333	0.887	-9	254	95.5	10.8	96	-	-
Rock Drill Lube 100	100	1608	0.927	-24	204	100	11.1	95	25.4	320
Rock Drill Lube 320	320	1609	0.934	-15	232	301	23.2	96	25.4	320
Rock Drill Lube 460	460	2593	0.904	-9	232	462	30.7	96	25.4	320
Rolling Oil HH	-	1612	0.810	-	43 ¹	1.4	-	-	-	-
RPM Borate EP Lube 68	68	1344	0.901	-33	> 190	65	8.6	103	43	12+
RPM Borate EP Lube 150	150	1340	0.91	-30	> 190	143	14.6	101	36	12+
RPM Borate EP Lube 220	220	1341	0.913	-21	> 190	210	18.8	100	36	12+
RPM Borate EP Lube 320	320	1342	0.917	-18	> 200	306	23.8	98	32	12+
RPM Borate EP Lube 460	460	1343	0.922	-18	> 200	440	30	97	32	12+
RPM Borate EP Lube 680	680	1345	0.936	-9	> 200	660	40	99	-	12+
RPM Borate EP Lube 1200	"1200"	1339	0.952	-6	> 220	1150	53	92	-	12+
Summit AX	460	1623	0.905	-6	240	430	28.5	93	-	-
Suniso 4SA	'54'	1626	0.897	-33	210	54	7.0	68	-	-
Synthetic Wheel Motor Lubricant EP 460	460	2961	0.913	-12	238	460	37	122	31.7	12
Synthetic Wheel Motor Lubricant EP 680	680	2962	0.916	-18	238	680	49	122	31.7	12
Texatherm 46	46	1357	0.874	-9	224	44.0	6.6	100	-	-
Torque Fluid 32	32	1358	0.875	-27	210	32	5.4	102		12+
Transformer Oil BSI	10	1692	0.884	-48	146	10.2	-	-	-	-
Transformer Oil BSI Inhibited	10	1693	0.884	-48	146	10.2	-	-	-	-
Trusol EP	-	1703	0.945	-	-	40	-	-	-	-
Trusol GP	-	1704	0.906	-	-	31.5	-	-	-	-
Vacuum Pump Oil R31	68	1595	0.881	-9	232	68	8.8	97	-	-
Way Lubricant X 68	68	1359	0.881	-27	215	64.6	8.42	110	-	-

¹ Pensky Marten Flash Point

TYPICAL CHARACTERISTICS

Greases

Product	NLGI Grade	Code	Thickener Type	Colour	Pen. Worked	Drop Point °C	Operating Temp °C	Base Oil Vis. cSt @ 40 °C	Timken OK Load kg	Additives ³
Anti-Seize Grease	2	3056	Bentone	Dk Grey		>270	-25 to 130 ⁴	520	-	Anti-seize
Delo Grease EP2	2	2909	Lithium Complex	Blue	280	>230	-40 to 177	202	30	EP
EP Grease C 0	0	1080	Lithium	Brown	370	180	-30 to 100	153	25	EP
EP Grease C 00	00	1081	Lithium	Brown	415	Semi-Fluid	-30 to 70	153	25	EP
EP Grease C 000	000	1082	Lithium	Brown	460	Semi-Fluid	-30 to 60	153	25	EP
EP Grease C 1	1	1083	Lithium	Brown	325	188	-30 to 130	153	25	EP
EP Grease C 2	2	1084	Lithium	Brown	280	188	-30 to 130	153	25	EP
EP Grease C 3	3	1085	Lithium	Brown	235	188	-20 to 130	153	25	EP
Food Machinery Grease	2	1086	Alumin.Complex	White	280	265	-30 to 160	220	18	EP
Grease 904	"1.5"	1066	Calcium	Grey/Black	310	100	-25 to 80	68	-	Graphite
Liplex EP2	2	1090	Lithium Complex	Blue/Green	280	265	-25 to 140	185	16	EP
Liplex Heavy Duty 2	2	3043	Lithium Complex	Brown	280	> 230	-15 to 130	680	>18	EP
Miltex EP 15001 LX	1	2872	Lithium Complex	Black	325	> 232	-20 to 130	1300	27.2	Moly, EP
Mine Grease Premium	2	3021	Lithium Complex	Black	280	> 220	-20 to 130	580	29.5	Moly, EP
Molygrease EP2	2	1093	Lithium	Black	280	188	-30 to 130	153	25	Moly, EP
Molygrease Heavy	2	1094	Lithium	Black	280	188	-20 to 120	430	25	Moly, EP
Multi-purpose Grease Green	2	2998	Bentone	Green	280	Non-Melt	-20 to 135 ²	460	-	-
Premium Cotton Picker Grease	00	1056	Lithium	L. Green	415	Semi-Fluid	-30 to 100	23	-	EP
Spray Grease ¹	2	1100	Lithium	Brown	280*	182	-30 to 130	153	-	EP
SRI Grease NLGI 2	2	1055	Polyurea	Blue/Green	280	243	-30 to 150	116	-	-
Texando FO 20 EP	2	1071	Calcium Complex	Yellow/Brown	280	280	-30 to 145	100	20	EP
Texclad 2	2	1072	Calcium	Black	280	100	-10 to 80	820	-	Graphite
TM Gearlube Premium	-	1075	Lithium	Black	-	Semi-Fluid	-5 to 100	367	18	EP
Ultra-Duty Grease 1	1	1076	Lithium	Red	325	174	-20 to 140	334	32	EP, Tack
Ultra-Duty Grease 2	2	1077	Lithium	Red	280	180	-10 to 140	380	32	EP, Tack

¹ Spray Grease without solvent or aerosol propellant
² Up to 250° with frequent re-lubrication
³ Most greases also contain rust and oxidation inhibitors
⁴ May be used up to 900°C where carrier grease is decomposed, leaving solid additives to afford lubrication

Cleaners

Product	Colour	CODE	Density @ 15 °C kg/L	PMCC Flash Point °C	pH
Kwik-D-Grease	Slightly coloured	1439	0.76 to 0.79	-60 (gas)	-
Safe-D-Grease	Colourless	1618	0.83	>61	-
Safe-D-Grease QB	Red	2620	0.83	>61	-
ToughWash	Red	2949	1.06	-	10 - 11
ToughWash Ultra	Green	2617	1.0	-	~ 10
TruckWash	Blue	2948	1.0	-	7.5 – 8.5

REFERENCE

API Engine Service Classification

C 'COMMERCIAL' CLASSIFICATION (FOR HEAVY-DUTY DIESEL ENGINES)

	DESCRIPTION	RELATED SPECIFICATIONS & TESTS
CJ-4	Introduced in 2006 for high-speed four-stroke cycle diesel engines designed to meet U.S. 2007 model year on-highway exhaust emission standards as well as for previous model years. These oils are especially effective at sustaining emission control system durability where particulate filters and other advanced aftertreatment systems are used.	Cummins CES 20081, Mack EO-O Premium Plus 07
CI-4 PLUS	Introduced in 2004 for the latest generation of North American 4-stroke heavy-duty diesel engines. May be used in place of CD, CE, CF-4, CG-4, CH-4 and CI-4 oils.	Cummins CES 20078, Mack EO-N Premium Plus (03)
CI-4	Introduced in 2002 for 4-stroke heavy-duty diesel engines meeting 2004 exhaust standards implemented in 2002 and to provide improvements in engine durability where exhaust gas recirculation (EGR) is used. May be used in place of CD, CE, CF-4, CG-4 and CH-4 oils.	Cummins CES 20078, Mack EO-N Premium Plus
CH-4	For 4-stroke diesel engines designed to meet 1998 emission standards. May be used in place of CD, CE, CF-4 and CG-4 oils.	Cummins M11, Mack EO-M, EO-M Plus, Caterpillar IP
CG-4	Introduced in 1994 for 4-stroke heavy-duty diesel engines meeting 1994 U.S. exhaust emission standards. Can be used in engines requiring CD, CE and CF-4 oils.	Caterpillar 1N, Mack EO-L
CF-4*	For 4-stroke heavy-duty diesel engines manufactured since 1990. CF-4 oils may be used in place of CE, CD or CC oils. CF-4 oils provide improved control of oil consumption and piston deposits.	Caterpillar 1K
CF-2	Introduced in 1994 for 2-stroke diesel engines requiring improved control of cylinder and ring-face scuffing and deposits. May also be used in place of CD-II oils. CF-2 oils do not necessarily meet the requirements of CF or CF-4 unless passing test requirements for these categories.	Caterpillar 1M-PC, Detroit Diesel 6V-92TA
CF	Introduced in 1994 for indirect injected diesel engines. CF oils can be used when CD is recommended.	Caterpillar 1M-PC
CE*	For 4-stroke heavy-duty diesel engines manufactured since 1983. Can be used when previous API Engine Diesel Category oils are recommended.	MIL-L-2104D/E, MIL-L-45199, Mack: EO-K/2, Cummins: NTC 400
CD-II*	For severe duty two stroke diesel engines. CD-II oils meet all the performance requirements of CD.	MIL-L-2104D, Detroit Diesel: 6V-53T
CD*	For severe naturally aspirated, turbocharged or supercharged diesel engines. Introduced in 1955.	MIL-L-2104C/D, MIL-L-45199
CC*	For moderate duty diesel and petrol engines. Introduced in 1961.	MIL-L-2104B
CB*		MIL-L-2104A Supp. 1
CA*		MIL-L-2104A

S 'SERVICE' CLASSIFICATION (PRIMARILY FOR PETROL ENGINES)

	DESCRIPTION	RELATED SPECIFICATIONS & TESTS
"SN"	Expected that this may be introduced in 2010.	"ILSAC GF-5"
SM	Introduced in 2004 to provide improvements in oxidation resistance, deposit control, antiwear and low temperature performance.	ILSAC GF-4
SL	Introduced in 2001 to provide improvements in high temperature deposit control and oil consumption.	ILSAC GF-3
SJ	Introduced in 1997 (First available 15 October 1996) to provide improvements in oil volatility, filterability, gelation, deposits and catalyst compatibility.	ILSAC GF-2, MIL-L-46152E
SH*	Introduced in 1994 to provide improvements in deposit control, oil oxidation, wear, rust and corrosion.	ILSAC GF-1
SG*	Introduced in 1989 to provide improvements in engine deposits, oil oxidation, and engine wear. Also provides protection against rust and corrosion.	Ford: ESE-M2C-153E, GM: 6048M, MIL-L-46152D
SF*	Introduced in 1980 to provide improvements in oxidation stability and anti-wear performance. Also provides protection against engine deposits, rust and corrosion.	Ford: ESE-M2C-153B/C/D, GM 6048M, Chrysler MS 6395, MIL-L-46152B/C
SE*	Introduced in 1972 to provide improvements in oil oxidation, high temperature engine deposits, rust and corrosion.	Ford: ESE-M2C-101C, GM 6136M, MIL-L-46152A
SD*	Introduced in 1968	
SC*	Introduced in 1964	
SB*	For minimum Duty Petrol Engines.	Inhibited oil (non-detergent).
SA*	For Utility Petrol and Diesel Engines.	Straight mineral oil.

ILSAC Engine Service Classification

	DESCRIPTION
GF-5	Proposed for introduction in 2010
GF-4	Effectively API SM plus the Sequence VI B fuel economy test with tighter limits. Also tightened limits on phosphorus and introduced limits on sulfur. Released in 2004.
GF-3	Effectively API SL plus the Sequence VI B fuel economy test. Released in 2000.
GF-2	Effectively API SJ plus the Sequence VI A fuel economy test. Released in 1996.
GF-1	Effectively API SH plus the Sequence VI fuel economy test. Released 1990 & revised 1992.

REFERENCE

ACEA Engine Service Classification

A/B : GASOLINE AND DIESEL ENGINE OILS

	DESCRIPTION
A1/B1	Oil intended for use in gasoline and car + light van diesel engines specifically designed to be capable of using low friction low viscosity oils with a High temperature / High shear rate viscosity of 2.6 to 3.5 mPa.s. These oils may be unsuitable for use in some engines. Consult owner manual or handbook if in doubt.
A3/B3	Stable, stay-in-grade oil intended for use in high performance gasoline and car + light van diesel engines and/or for extended drain intervals where specified by the engine manufacturer, and/or for year-round use of low viscosity oils, and/or for severe operating conditions as defined by the engine manufacturer.
A3/B4	Stable, stay-in-grade oil intended for use in high performance gasoline and direct injection diesel engines, but also suitable for applications described under B3.
A5/B5	Stable, stay-in-grade oil intended for use at extended drain intervals in high performance gasoline and car + light van diesel engines designed to be capable of using low friction low viscosity oils with a High temperature / High shear rate viscosity of 2.9 to 3.5 mPa.s. These oils may be unsuitable for use in some engines. Consult owner manual or handbook if in doubt.

C: CATALYST COMPATABILITY OILS

	DESCRIPTION
C1	Stable, stay-in-grade oil intended for use as catalyst compatible oil in vehicles with DPF and TWC in high performance car and light van diesel and gasoline engines requiring low friction, low viscosity, low SAPS oils with a HTHS higher than 2.9 mPa.s. These oils will increase the DPF and TWC life and maintain the vehicle's fuel economy. Warning : these oils have the lowest SAPS limits and may be unsuitable for use in some engines. Consult owner manual or handbook if in doubt.
C2	Stable, stay-in-grade oil intended for use as catalyst compatible oil in vehicles with DPF and TWC in high performance car and light van diesel and gasoline engines designed to be capable of using low friction, low viscosity oils with a HTHS higher than 2.9 mPa.s. These oils will increase the DPF and TWC life and maintain the vehicle's fuel economy. Warning : these oils may be unsuitable for use in some engines. Consult owner manual or handbook if in doubt.
C3	Stable, stay-in-grade oil intended for use as catalyst compatible oil in vehicles with DPF and TWC in high performance car and light van diesel and gasoline engines. These oils will increase the DPF and TWC durability. Warning : these oils may be unsuitable for use in some engines. Consult owner manual or handbook if in doubt.
C4	Stable, stay-in-grade oil intended for use as catalyst compatible oil in vehicles with DPF and TWC in high performance car and light van diesel and gasoline engines requiring low SAPS oil with HTHS higher than 3.5mPa.s. These oils will increase the DPF and TWC life. Warning: these oils may be unsuitable for use in some engines. Consult owner manual or handbook if in doubt.

SAPS is Sulfated Ash, Phosphorus, Sulfur.

DPF is Diesel Particulate Filter.

TWC is Three Way Catalyst.

HTHS is High Temperature / High Shear rate viscosity

E: HEAVY DUTY DIESEL ENGINE OILS

	DESCRIPTION
E2	General purpose oil for naturally aspirated and turbocharged heavy duty diesel engines, medium to heavy duty cycles and mostly normal oil drain intervals.
E4	Stable, stay-in-grade oil providing excellent control of piston cleanliness, wear, soot handling and lubricant stability. It is recommended for highly rated diesel engines meeting Euro 1, Euro 2, Euro 3 and Euro 4 emission requirements and running under very severe conditions, e.g. significantly extended oil drain intervals according to the manufacturer's recommendations. It is suitable for engines without particulate filters, and for some EGR engines and some engines fitted with SCR NOx reduction systems. However, recommendations may differ between engine manufacturers so Driver Manuals and/or Dealers should be consulted if in doubt.
E6	Stable, stay-in-grade oil providing excellent control of piston cleanliness, wear, soot handling and lubricant stability. It is recommended for highly rated diesel engines meeting Euro 1, Euro 2, Euro 3 and Euro 4 emission requirements and running under very severe conditions, e.g. significantly extended oil drain intervals according to the manufacturer's recommendations. It is suitable for EGR engines, with or without particulate filters, and for engines fitted with SCR NOx reduction systems. E6 quality is strongly recommended for engines fitted with particulate filters and is designed for use in combination with low sulfur diesel fuel (max 50 ppm). However, recommendations may differ between engine manufacturers so Driver Manuals and/or Dealers should be consulted if in doubt.
E7	Stable, stay-in-grade oil providing effective control with respect to piston cleanliness and bore polishing. It further provides excellent wear and turbocharger deposit control, soot handling and lubricant stability. It is recommended for highly rated diesel engines meeting Euro 1, Euro 2, Euro 3 and Euro 4 emission requirements and running under severe conditions, e.g. extended oil drain intervals according to the manufacturer's recommendations. It is suitable for engines without particulate filters, and for most EGR engines and most engines fitted with SCR NOx reduction systems. However, recommendations may differ between engine manufacturers so Driver Manuals and/or Dealers should be consulted if in doubt.
E9	Stable, stay-in-grade oil providing effective control with respect to piston cleanliness and bore polishing. It further provides excellent wear control, soot handling and lubricant stability. It is recommended for highly rated diesel engines meeting Euro I, Euro II, Euro III, Euro IV and Euro V emission requirements and running under severe conditions, e.g. extended oil drain intervals according to the manufacturer's recommendations. It is suitable for engines with or without particulate filters, and for most EGR engines and for most engines fitted with SCR NOx reduction systems. E9 is strongly recommended for engines fitted with particulate filters and is designed for use in combination with low sulphur diesel fuel. However, recommendations may differ between engine manufacturers so Drivers Manuals and/or Dealers should be consulted if in doubt

More detail is available at http://www.acea.be/images/uploads/files/20090105_081211_ACEA_Oil_Sequences_Final.pdf

REFERENCE

JASO Classifications

TWO CYCLE GASOLINE ENGINE OIL PERFORMANCE CLASSIFICATION

The performance level of two cycle oils is classified into three grades FB, FC and FD according to test results in four engine tests (a lubricity test, a detergency test, a smoke test and an exhaust system blocking test); and three properties (kinematic viscosity at 100°C, flash point and sulfated ash). FA was an earlier classification that is now obsolete.
FB is the base grade.
FC is superior to FB in exhaust smoke and exhaust system blocking.
FD is superior to FC in high temperature detergency

FOUR STROKE MOTORCYCLE GASOLINE ENGINE OIL CLASSIFICATION

Oils are classified into four grades (MA, MA1, MA2, MB) according to their performance in a clutch friction test. Additionally, oils must meet one of the following performance categories: API SG, SH, SJ, SL, SM, or ILSAC GF-1, GF-2, GF-3, ACEA A1/B1, A3/B3, A3/B4, A5/B5, C2, C3 and must meet certain limits on sulfated ash, phosphorus content, evaporative loss, foaming, shear stability and high temperature high shear viscosity.

AUTOMOTIVE DIESEL ENGINE OIL CLASSIFICATION

The JASO DH-1, DH-2 and DL-1 categories are defined in the Automotive Diesel Engine Oil Standard "JASO M 355: 2008".

The JASO DH-1 category was developed for four stroke automotive diesel engines subject to the Japanese long-term exhaust emission regulations. The DH-1 classification stipulates wear prevention, corrosion prevention, high-temperature oxidation stability, and soot control etc. DH-1 oils are targeted at the suppression of deterioration of piston detergency, formation of deposits at high temperature, foaming, oil consumption due to evaporative loss, viscosity decrease by shear, deterioration of oil seals. etc. Such oils may also be used in engines which predate the Japanese long-term exhaust emission regulations. When the appropriate engine manufacturers' recommendations on drain interval are followed, DH-1 oils may be used with fuel in excess of 500 ppm sulfur.

The JASO DH-2 and JASO DL-1 classifications were developed for four stroke automotive diesel engines equipped with after-treatment devices such as Diesel Particulate Filters (DPF) and catalysts in compliance with exhaust emission regulations subsequent to the Japanese new short-term regulations. DH-2 and DL-1 oils are eminently suitable for DPF and catalyst equipped vehicles and provide the same performance level as the DH-1 classification.

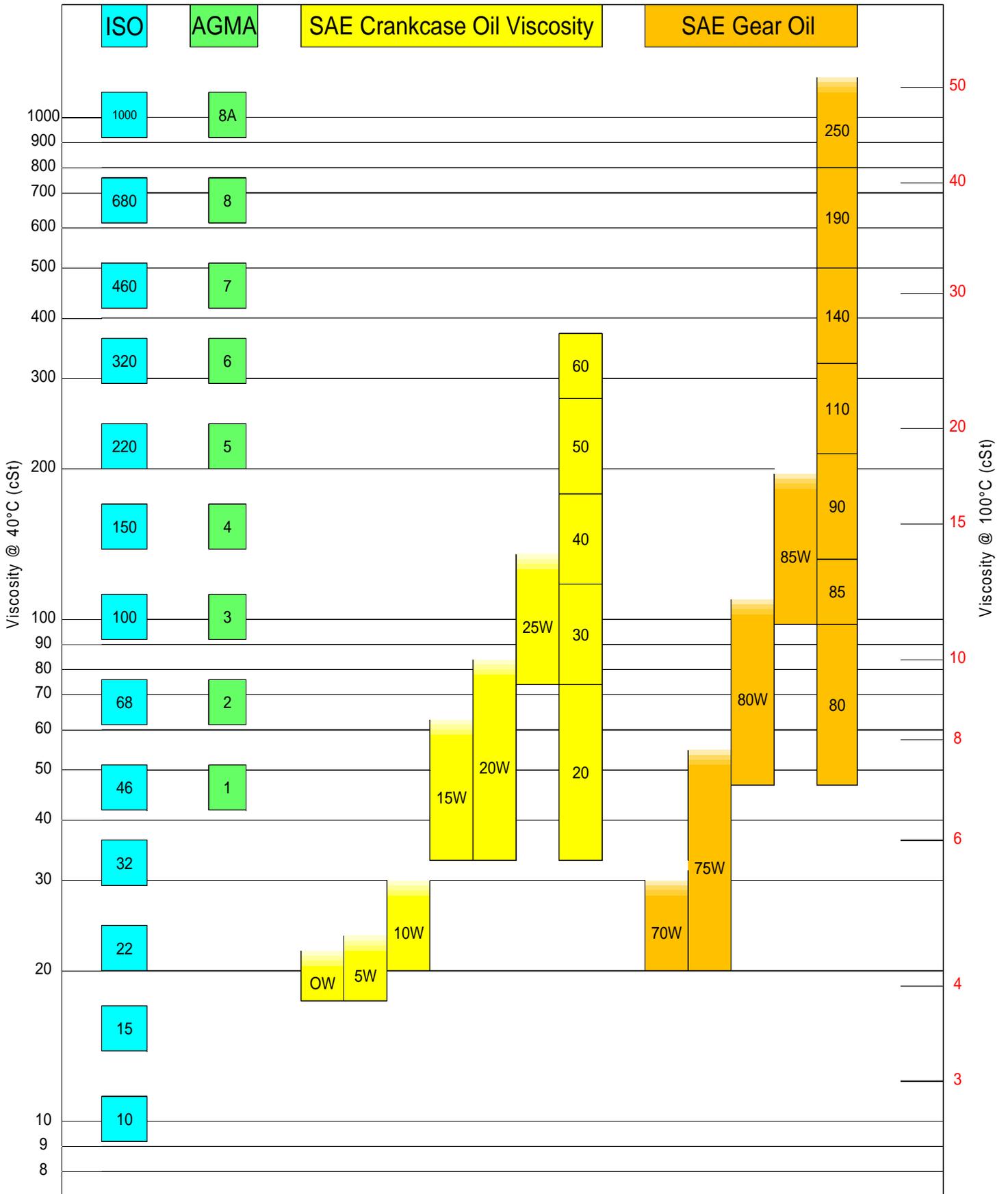
Because the requirements of truck and bus differ from those of passenger cars in engine durability, service interval, fuel economy, etc., the DH-2 classification was designed for heavy-duty use by trucks and buses while the DL-1 classification was designed for light-duty use by passenger cars.

DH-2 and DL-1 oils are recommended only where fuel sulfur is < 50 ppm. Where such fuel is used and engine manufacturer oil change intervals are followed. DH-2 oils may also be used in engines predating the Japanese new short-term exhaust emission regulations.

More information is available at http://www.jalos.or.jp/onfile/jaso_e.htm

REFERENCE

Comparative Viscosity Classifications



Winter grade (W) viscosities are also defined at low temperatures as well as minimum viscosities at 100°C (shown here). For a complete definition See the SAE J300 and J306 tables.

REFERENCE

SAE Viscosity Classification - Engine Oil (SAE J300)

SAE Viscosity Grade	Low Temperature (°C) Cranking Viscosity ² , mPa.s Max	Low Temperature (°C) Pumping Viscosity ³ , mPa.s Max with Yield Stress	Kinematic Viscosity ⁴ (mm ² /s) at 100°C Min	ematic Viscosity ⁴ (mm ² /s) at 100 °C Max	High Shear Viscosity ⁵ mPa.s at 150 °C and 10 ⁶ s ⁻¹ Min
0W	6,200 at -35	60,000 at -40	3.8	-	-
5W	6,600 at -30	60,000 at -35	3.8	-	-
10W	7,000 at -25	60,000 at -30	4.1	-	-
15W	7,000 at -20	60,000 at -25	5.6	-	-
20W	9,500 at -15	60,000 at -20	5.6	-	-
25W	13,000 at -10	60,000 at -15	9.3	-	-
20	-	-	5.6	< 9.3	2.6
30	-	-	9.3	< 12.5	2.9
40	-	-	12.5	< 16.3	2.9 (0W-40, 5W-40, 10W-40)
40	-	-	12.5	<16.3	3.7 (15W-40, 20W-40, 25W-40, 40)
50	-	-	16.3	< 21.9	3.7
60	-	-	21.9	< 26.1	3.7

¹ All values are critical specifications as defined by ASTM D3244.
² ASTM D5293.
³ ASSTM D4684. Note that the presence of any yield stress detectable by this method constitutes a failure regardless of viscosity.
⁴ ASTM D445.
⁵ ASTM D4683, CECL-36-A-90, ASTMD 4741 and D5481.

SAE Viscosity Classification - Axle & Manual Transmission Lubricant (SAE J306)

SAE Viscosity Grade	Maximum Temperature for Viscosity of 150,000 cP, °C	Viscosity (cSt) @ 100 °C		Approx. Equivalent ISO Grade
		Min*	Max	
70W	-55	4.1	NR	22 – 32
75W	-40	4.1	NR	22 – 46
80W	-26	7.0	NR	46 – 100
85W	-12	11.0	NR	100 – 150
80	NR	7.0	< 11.0	46 – 100
85	NR	11.0	< 13.5	100
90	NR	13.5	< 18.5	150 – 220
110	NR	18.5	< 24.0	220 - 320
140	NR	24.0	< 32.5	320 – 460
190	NR	32.5	< 41.0	680
250	NR	41.0	NR	1000

NR – No Requirement
*Limit must be met after testing in CEC L-45-T-93 (20 hours)

REFERENCE

API Gear Lubricant Classification - Axle & Manual Transmission Lubricants (SAE J308)

Classification	Type	Typical Application
GL-1*	Straight mineral oil.	Some automotive manual transmissions under mild service.
GL-2*	Usually contains fatty material.	Worm drives and some industrial gear boxes.
GL-3*	Contains mild EP additives.	Manual transmissions and spiral bevel final drives under moderate service conditions.
GL-4	Contains EP additives. Equivalent to MIL-L-2105.	Manual transmissions and transaxles, spiral bevel and hypoid gears in normal service without shock loading.
GL-5	Contains higher concentration of EP additives. Equivalent to MIL-L-2105 B/C/D.	Hypoid and all other types of gears in severest service including shock loading. Primary field service recommendation for most passenger cars and trucks. Also may be used in manual transmissions.
GL-6*	Obsolete	Hypoid gears with very high pinion offset.
MT-1	Protection against the combination of thermal degradation, component wear and oil seal deterioration. May or may not contain EP additives.	Non synchronised manual transmissions used in buses and heavy duty trucks.
* Obsolete		

REFERENCE

National Lubricating Grease Institute Grease Classification

Grade Number	Worked Penetration @ 25 °C
000	445 to 475
00	400 to 430
0	355 to 385
1	310 to 340
2	265 to 295
3	220 to 250
4	175 to 205
5	130 to 160
6	85 to 115

Grease Compatibility Chart

B = Borderline Compatibility C = Compatible I = Incompatible	Aluminium Complex	Barium	Calcium	Calcium 12-hydroxy	Calcium Complex	Clay (Bentonite)	Sodium	Lithium 12-hydroxy	Lithium Complex	Polyurea
Aluminium Complex	X	I	I	I	I	I	I	B	B	B
Barium	I	X	I	I	I	I	I	I	I	I
Calcium	I	I	X	C	B	I	I	B	B	I
Calcium 12-hydroxy	I	I	C	X	B	I	I	C	B	I
Calcium Complex	I	I	B	B	X	I	I	B	B	B
Clay (Bentonite)	I	I	I	I	I	X	I	I	I	I
Sodium	I	I	I	I	I	I	X	I	I	I
Lithium 12-hydroxy	B	I	B	C	B	I	I	X	C	B
Lithium Complex	B	I	B	B	B	I	I	C	X	B
Polyurea	B	I	I	I	B	I	I	B	B	X

B = Borderline Compatibility

C = Compatible

I = Incompatible

NB: The compatibility of greases should be checked before mixing.

Additives may give rise to incompatibility between greases that are normally compatible.

As a general rule the mixing of different grease types is NOT recommended.

HEALTH & SAFETY GUIDE TO PETROLEUM PRODUCTS

FIRE SAFETY

All petroleum products will burn if conditions are suitable. It is essential that they are stored, transferred and handled sensibly, adopting adequate precautions to avoid a fire hazard.

Petroleum products are classified in accordance with Australian Standard 1940-2004 into flammable and combustible liquids.

FLAMMABLE LIQUIDS

Flammable Liquids are defined by the Australian Code for the Transport of Dangerous Goods by Road and Rail, 1998 (ADG) as Class 3 liquids which are subdivided into the following packaging groups:

PACKAGING GROUP	FLASH POINT (PMCC)	INITIAL BOILING POINT	PRODUCTS INCLUDE
I	--	< 35 °C	Volatile Solvents
II	< 23 °C	> 35 °C	Petrol; Toluol; Medium Volatility Solvents
III	> 23 °C to > 61 °C	> 35 °C	Kerosenes; Mineral Turps.; Jet A1; Most Low Volatility Solvents

COMBUSTIBLE LIQUIDS

Combustible Liquids are defined as any liquid, other than flammable liquids, that has a flash point less than its boiling point. They are divided into two classes as follows:

Class	Flash Point	Products Include
C1	<150 °C	Heating Oil, Diesel, Diesel Fuel, Furnace Oil. Some Low Volatility Solvents
C2	Above 150 °C	Lubricating Oils, Greases, Cutting Oils, Bitumen

STORAGE OF PETROLEUM PRODUCTS

Particular care must be exercised when working with flammable products. All sources of ignition must be rigorously excluded and the work areas must be well ventilated. All petroleum products should be stored in the prescribed manner and away from sources of heat, flame and strong oxidising agents. Plastic containers should not be used for storing fuels and solvents unless specifically designed for this purpose.

Care must also be exercised in transferring flammable products, for example, filling or discharging road tank wagons, fuelling aircraft and filling drums, because static electricity can build up and lead to sparks. Products must be pumped at prescribed flow rates and storage tanks and containers must be earthed.

A health and safety data sheet is available for every Caltex product and should be consulted before use. These can be downloaded from the Caltex web site, www.caltex.com.au.

Health Guide

Petroleum products are not dangerous to health provided they are handled correctly with particular emphasis on personal hygiene. However, misuse or accident can give rise to health hazards with some products.

Health hazards can arise in four different ways:

- Ingestion (swallowing)
- Inhalation (breathing in)
- Aspiration (liquid entering lungs)
- Skin and eye contact

All such hazards may be avoided by wearing the appropriate protective clothing, providing a proper working environment, and using the correct handling aids. Also, as a matter of course, all petroleum products should be stored out of reach of children and away from food preparation/consumption areas. For guidance refer to the Material Data Safety Sheet (MSDS) specific to the product.

Personal Hygiene

Personal hygiene is not only desirable - it is essential. The following is a guide to good practice in handling petroleum products.

1. Wash hands thoroughly before and after working with petroleum products using soap and water or an approved hand cleanser. Do not use petrol or solvents to wash hands. Apply a restorative cream after washing at the end of the day's work.
2. Wash hands thoroughly before eating. Do not eat on the job.
3. Wear appropriate protective clothing. Keep it clean and in good condition and keep it separate from street clothing.
4. If clothing is contaminated with a spill, wet it down with water and then change it.
5. Give prompt first aid attention to cuts and sores and protect adequately.
6. Avoid breathing vapours, fumes or dusts.

GLOSSARY

ACEA	Association des Constructeurs Europeen d'Automobiles.
Acid Number (AN)	Milligrams of KOH required in tests to neutralize all the acidic constituents present in a 1 gram sample of petroleum product. Also formerly called the Neutralization Number. This property is often used to indicate the extent of contamination or oxidation of used oils.
Additive	Any material incorporated into a lubricant to provide new properties or enhance existing properties.
Air Release	The ability of a fluid to allow the escape of entrained air.
Anhydrous	Devoid of water.
Aniline Point	The minimum temperature for complete miscibility of equal volumes of aniline and the sample under test. Products containing aromatics or naphthenes have lower aniline points than products containing paraffins.
Anti-foam Agent	An additive included in some lubricants to suppress foam formation.
Anti-oxidant	An additive included in some lubricants to inhibit the chemical breakdown of the base oil and some additive constituents by reaction with oxygen.
Anti-wear Agent	An additive, either physical or chemical in nature, included in some lubricant formulations to reduce friction and wear.
API	American Petroleum Institute.
API Gravity	Arbitrary scale expressing, in degrees API, the specific gravity of liquid petroleum products. <i>Degrees API = (141.5 / sp gr 60/60°F) - 131.5</i>
API Service Classification	System of letter designations agreed on by API, SAE and ASTM to define broad classes of engine oil service. Also a system of service classifications for automotive gear lubricants.
Apparent Viscosity	Measure of the viscosity of a non-Newtonian fluid under specific temperature and shear rate conditions.
Aromatic	A hydrocarbon derived from, or characterised by, the presence of the benzene ring.
Ash	Metallic deposits formed in the combustion chamber and other engine parts during high-temperature operation.
Ash (Sulfated)	<i>See Sulfated Ash.</i>
ASTM	American Society for Testing and Materials.
Bactericide	A chemical compound which has the property to kill bacteria.
Base Number (BN)	Quantity of hydrochloric (ASTM D974) or perchloric (ASTM D2896) acid expressed in milligrams of KOH equivalent that is required to neutralize all the basic constituents of a 1 gram sample of petroleum product. This property is used to indicate the capacity of an oil to counter the corrosive effects of acidic products of combustion.
Biodegradable	The capacity of a substance to decompose by the biological action of living organisms.
Bore Glazing	A phenomenon that results in loss of oil consumption control. Bore glazing, as contrasted to bore polishing, is characterised by a deposit or coating on the bore/liner of the engine. Bore glazing is believed to occur at low speed and light load operations.
Bore Polishing	Characterised by a clearly defined area of bright mirror finish on the cylinder bore. It is caused by local mechanical wear of the surface, resulting in loss of oil consumption control. Believed to be brought about by the build up of carbon deposits in the ring area.
Boundary Lubrication	Lubrication between two rubbing surfaces without the development of a full lubricating film. It occurs under high load and low speed and requires the use of anti-wear or extreme pressure additives to prevent metal-to-metal contact.
BP	Abbreviation for British Pharmacopoeia usually used in reference to a purity standard for medicinal white oils, or white oils that will come into contact with foods.
Bright stock	Refined, high viscosity lubricating oils usually made from residual stocks by suitable treatment, such as a combination of acid treatment or solvent extraction with dewaxing or clay finishing.
Brookfield Viscosity	Measure of the apparent viscosity of a non-Newtonian fluid as determined by a Brookfield viscometer at a controlled temperature and shear rate.
Carbon Residue	Standardized test which measures the amount of carbon left behind after pyrolysis under standard conditions.
Cetane Index	A value calculated from the density and distillation properties of a fuel, used as an alternative to cetane number to indicate relative diesel ignition quality.
Cetane Number	A number that expresses the ignition quality of a diesel fuel. A high number indicates short ignition delay which affords easy starting and quiet running.
Cetane Number Improver	Additive which improves the Cetane Number of a diesel fuel.
Cleveland Open Cup (COC) Tester	Apparatus used to determine the flash and fire points of most petroleum products with flash points above 79oC.

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CentiPoise (cP)	A unit of absolute viscosity. 1 centiPoise = 0.01 Poise = 1 mPa.s.
CentiStoke (cSt)	A unit of kinematic viscosity. 1 centiStoke = 0.01 stoke = 1 mm ² /s.
Cloud Point	The temperature at which wax in an oil or fuel begins to crystallise giving a cloudy appearance.
CNG	Compressed natural gas.
Cold Cranking Simulator (CCS)	An intermediate shear rate viscometer that predicts the ability of an oil to permit satisfactory cranking speed in a cold engine.
Cold Filter Plugging Point (CFPP)	Highest temperature at which a given volume of fuel fails to pass through a standardised filtration device in a specified time, when cooled under standardised conditions.
Complex Grease	Lubricating grease thickened by a complex soap consisting of a normal soap and a complexing agent. Use of soap complexes gives products which have higher dropping points than similar lubricants made from normal soaps.
Consistency	A basic property describing the hardness or softness of a grease, i.e. the degree to which a grease resists deformation. It is usually indicated by NLGI number.
Corrosion Inhibitor	An additive included in some lubricants and coolants to help to protect against metal corrosion.
Defoamant (Foam Inhibitor)	Additive used in lubricating oils to assist the collapse of surface layers of foam caused by agitation or the release of entrained or entrapped air.
Demulsibility	The ability of a lubricant to separate from water.
Density	The mass of a unit volume of a substance. Its numerical value varies with the units used, generally kg/L, and with temperature.
Deposits	Oil insoluble materials that result from oxidation and decomposition of lubricating oil and contamination from external sources and engine blow-by. Examples are sludge, varnish, lacquer and carbon.
Detergent	An additive included in most engine oils to inhibit deposit formation and keep lubricated surfaces clean.
Detonation	Uncontrolled burning of the last portion of the air/fuel mixture in the cylinder of a spark ignition engine. Also known as "knock" or "ping".
Dielectric Strength	Measure of the insulating value of an electrical insulating medium. The value depends to some extent on the test method used.
Dispersant	An additive included in most engine oils to disperse and suspend insoluble contaminants so that they can be removed from the system when the oil is drained.
Distillate Fuel	Fuel composed mainly of materials evaporated during the distillation of crude oil.
DN Factor	Old reference to define bearing speed. Corresponds to bearing bore in millimetres (D) multiplied by the speed in rpm (N). Current terminology is ndm.
Drop Point	The temperature at which the first drop of oil separates from a grease when it is heated under prescribed conditions.
Emission Control System	Any of several systems intended to reduce the amount of atmospheric pollutants released by automotive vehicles.
Emulsibility	The ability of a non-water soluble fluid to form an emulsion with water. Emulsifiers are used to promote the formation of emulsions.
Emulsion	A mixture of two insoluble liquids, such as oil and water, consisting of droplets of one liquid dispersed throughout the other.
End Point	The highest vapour temperature recorded during the distillation test of a petroleum product.
EP Additive	See <i>Extreme Pressure (EP) Additive</i> .
Exhaust Gas Recirculation (EGR)	System to reduce automotive emission of nitrogen oxides (NO _x). It introduces exhaust gases into the intake manifold where they dilute the air/fuel ratio. This reduces peak combustion temperatures, lessening the tendency for nitrogen oxides to form.
Extreme Pressure (EP) Additives	Chemical compounds which provide lubricants with extra protection against wear. Under heavy loads, EP additives form a protective chemical film on the surfaces in contact.
Fibre Grease	A grease with distinctly fibrous or stringy structure, noticeable when portions of the grease are pulled apart.
Filler	Any substance such as talc, mica or various powders, which may be added to a grease, but is not considered as being primarily intended to enhance the lubricating properties of the grease.
Film Strength	Ability of a film of lubricant to resist rupture due to load, speed and temperature
Flash Point	The temperature to which a combustible liquid must be heated to give off sufficient vapour to form momentarily a flammable mixture with air when a small flame is applied under specified conditions.

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Floc Point	The temperature at which a flocculent collection of wax crystals first appear when a solution of Freon in oil is cooled under prescribed conditions.
Foam Inhibitor	See <i>defoamant</i> .
FZG Load Stage	The load which can be transmitted by a pair of gears under the conditions of test and temperature in the FZG gear machine.
Gaseous Fuels	Hydrocarbon gases (methane, ethane, propane, butane) which are used as internal combustion engine fuels. There is also an increase in interest in gaseous fuels gathered from landfills and sewage treatment plants for the purposes of power generation.
Gasohol	A blend of petrol and methanol or ethanol for use in spark ignition engines.
Hydrolytic Stability	The ability of additives and certain synthetic lubricants to resist chemical decomposition (hydrolysis) in the presence of water.
Induction Period	The time period, in an oxidation test, during which oxidation proceeds at a constant and relatively low rate.
Insolubles	Contaminants found in used oils due to dust, dirt, wear particles or oxidation products. Often measured as pentane, toluene or benzene insolubles to characterise the nature of the insoluble material.
ISO	International Standards Organisation. The body, which, among other things, lays down the standard for the viscosity at 40oC - mostly used in industrial gear lubricants and hydraulic oils.
JASO	Japanese Automobile Standards Organisation.
Joule	Unit of energy. That energy dissipated in one second by a current of one ampere flowing across a potential difference of one volt.
Kinematic Viscosity	Measure of a fluid's resistance to flow under gravity at a specific temperature (usually 40oC or 100oC).
Knock	See <i>Detonation</i> .
KOH	Chemical symbol for the alkaline compound potassium hydroxide.
Load-Carrying Capacity	Qualitative term to describe the ability of a lubricant to resist film rupture and protect against wear and surface destruction under conditions of high speeds, high loads, high temperatures or combinations of these.
Load Wear Index	Index of the ability of a lubricant to prevent wear under applied loads as determined in the Four-Ball EP Tester.
LPG	Liquefied petroleum gas.
Lubrication	Control of friction and wear by the introduction of a friction reducing film between moving surfaces in contact. The film may be fluid, solid or plastic.
Metal Deactivator	Organic type of additive having the property of suppressing the catalytic action of metal surfaces and traces of metallic materials exposed to petroleum products. The most important catalytic action is the promotion of oxidation.
MIL-	Prefix designation for US Military Specifications.
Miscibility	The ability or tendency of one liquid to mix or blend uniformly with another. Alcohol is miscible in water; petrol and water are immiscible. See also solubility, often used in the same sense in reference to liquids.
Moly	Commonly used abbreviation for molybdenum disulfide.
Molybdenum Disulfide	Chemical compound of molybdenum and sulfur which has excellent properties as a solid lubricant due to the type of molecular structure of the particles.
Monograde	A single SAE grade across the normal temperature range.
Motor Octane Number (MON)	A numerical indication of a petrol's ability to prevent detonation under high speed, high load engine operation.
Multigrade	An oil with a viscosity which satisfies the requirements of more than one grade of the SAE system i.e. the viscosity limits, e.g. 15W-40, 20W-50.
Multipurpose Grease	Lubricating grease suitable for a variety of applications such as chassis, wheel bearings, universal joints and water pumps on automotive equipment.
Multiviscosity	See <i>Multigrade</i> .
Naphthenic	Having the characteristics of naphthenes, which are saturated hydrocarbons containing molecules with at least one closed ring of carbon atoms.
ndm	Used to define bearing speeds. "dm" is the arithmetical mean of the outer diameter and the bore in millimetres (sometimes called the pitch diameter), "n" is the speed in rpm.
Neutralisation Number	Measure of the acidity or alkalinity of an oil. The number is the mass in milligrams of the amount of acid (HCl) or base (KOH) required to neutralise one gram of oil.
Newtonian Flow	Flow in a fluid where the shear rate (flow rate) is directly proportional to the shearing force (pressure).

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NF	Abbreviation for National Formulary (US), generally used in reference to requirements for the purity of white oils.
Nitration	Process whereby nitrogen oxides attack petroleum fluids at high temperatures, often resulting in viscosity increase, corrosion and deposit formation.
NLGI	National Lubricating Grease Institute is a body which, among other things, designates the NLGI number which is an indication of the grease consistency or relative hardness ranging from NLGI 6 (hardest) to NLGI 000 (fluid) grease.
NMMA	National Marine Manufacturers Association (USA).
Non-Newtonian Flow	Flow in a fluid where the shear rate (flow rate) varies in relationship to the shear force (pressure). Oils containing viscosity index improvers exhibit non-Newtonian flow.
Octane Number	A number indicating the knock rating or resistance to detonation of petrol. It is defined as the percent by volume of iso-octane in a mixture with n-heptane. The mixture has the same knock rating under standard engine test conditions as the test fuel.
Octane Requirement (OR)	The lowest octane number reference fuel that will allow an engine to run knock free under standard conditions of service. OR is a characteristic of each individual engine.
Octane Requirement increase (ORI)	As deposits accumulate in the combustion chamber of an engine, its octane requirement (OR) increases.
Oxidation Stability	Ability of a lubricant to resist oxidation and deterioration resulting from high temperatures and/or exposure to air.
Oxygenate	Organic compounds containing oxygen which can be blended into petrol to improve the octane number or reduce exhaust carbon monoxide (CO) content. Alcohols and ethers are oxygenates, some of which may be used in petrol formulation.
PAO	Polyalpha olefin. Synthetic oil as a base for lubricant.
Paraffinic	Having the characteristics of paraffins, saturated hydrocarbons of open chain structure.
PCV System	Abbreviation for Positive Crankcase Ventilation system, a system for internal combustion engines designed to provide positive scavenging of crankcase vapours and return them to the intake system.
Penetration	The depth, in tenths of a millimetre, that a standard cone penetrates a semi-solid sample, eg. grease, petroleum jelly etc., under specified conditions, usually at 25 °C.
Poise	The standard unit of absolute viscosity in the cgs system. Expressed in dyne-sec/cm ² .
Pour point	The lowest temperature at which a lubricant will pour or flow under specified conditions.
Pour Point Depressant	An additive which lowers the pour point of petroleum products containing wax by reducing the tendency of the wax to collect into a solid mass.
Preignition	Ignition of the fuel/air mixture in a petrol engine before the spark plug fires. Often caused by incandescent deposits in the combustion chamber.
R134a	Refrigerant. New ecologically sound hydrofluorocarbon (HFC) refrigerant.
Reid Vapour Pressure (RVP)	Usually used in reference to petrol, it is the vapour pressure of a sample at 37.8oC (100oF).
Residual Fuel	Fuel composed mainly of materials remaining as unevaporated after distillation of crude oil.
Ring Sticking	Sticking of the piston ring in its groove, usually due to heavy deposits in the piston ring zone.
Rust and Oxidation (R&O)	Additives used to enhance the rust and oxidation resistance of oils and greases.
SAE	Society of Automotive Engineers.
SAE Viscosity Classification	Society of Automotive Engineers. The SAE system classifies engine and transmission and axle lubricants according to their viscosity, eg; Engine Oils SAE 15W-40; SAE 30, Gear Oils SAE 85W-140 etc.
Series 3	Abbreviation for the discontinued Caterpillar Tractor Company crankcase oil specification "Superior Lubricants (Series 3)".
Shear Stability	The ability of a liquid to resist being degraded by mechanical shearing forces. Particularly applicable to multigrades containing viscosity index improvers.
SHPD Engine Oil	Super High Performance Diesel Engine Oil, usually used in relation to European diesel engines.
SKF Test	Any of several practical tests for greases using ball or roller bearings, developed by SKF.
Sludge	Insoluble material formed as a result either of deterioration reactions in an oil or of contamination of an oil, or both.
Smoke Point	Term numerically indicating the burning characteristics of kerosine or aviation turbine fuels.
Soap	General term for the "salt" of a fatty acid. Ordinary washing soaps are those of sodium and potassium. Soaps of lithium, sodium, calcium, barium and aluminium are the principal thickeners used in grease making.
Solvent Neutral Oil (SNO)	Base oil manufactured from solvent refined paraffinic lube distillates.

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Spindle Oil	Low viscosity oil for the lubrication of high speed spindles such as those used in textile mills.
STOU	Super Tractor Oil Universal. Combines tractor engine crankcase, wet brake, transmission and hydraulic characteristics.
Straight Mineral	Oils which do not contain compounds or "additives".
Sulfated Ash	Residue that remains after a sample of oil has been oxidized under prescribed conditions and the resulting residue reduced to a constant weight by heating with sulfuric acid. Used as a measure of the amount of metallo-organic additives present in new oils. In used oils, the determination may be affected by the presence of incombustible contaminants such as lead alkyls, dust and wear metals.
Sulfurised Oil	An oil in which elemental sulfur is either loosely combined with the oil, or is combined with a fatty oil and added to the oil. Used in applications where reactive sulfur is desired to provide extreme pressure characteristics, such as in gear oils and cutting oils.
Supercharger	A mechanically driven turbine/compressor used to deliver above atmospheric pressure air to the inlet manifold.
Supplement 1	Abbreviation for obsolete military specification US Army 2-104B (Supplement 1).
Synthetic Lubricant	Lubricant made chemically by reacting materials of a specific chemical composition to produce a compound with planned and predictable physical and chemical properties.
Tacky	A term applied to greases and lubricants that are particularly sticky or adhesive to metal surfaces.
Thermal Stability	Property of a fuel or lubricant which indicates its ability to resist cracking and decomposition on prolonged exposure to elevated temperatures.
THF (TOU)	Tractor Hydraulic Fluid. Combines tractor wet brake, transmission and hydraulic characteristics.
Thickener	Solid particles which are uniformly dispersed to form the structure of a grease in which the liquid lubricant is held.
Timken OK Load	Maximum load a lubricant will withstand without failure due to breakdown of the lubricant film, as determined on the Timken EP Lubricant Tester.
Total Acid Number (TAN)	The quantity of base, expressed in milligrams of potassium hydroxide, that is required to neutralise all acidic constituents present in 1 gram of sample.
Total Base Number (TBN)	The quantity of acid, expressed in terms of the equivalent number of milligrams of potassium hydroxide that is required to neutralise all basic constituents present in 1 gram of sample.
TOU	Tractor Oil Universal. See <i>THF</i> .
Turbocharger	An exhaust gas driven turbine mounted to a petrol or diesel engine, which in turn drives a rotary compressor to give above atmospheric pressures to the inlet manifold.
Typical Test	Test results that are characteristic of a product, normally mean values obtained from analysis of a number of production batches of that product.
USP	Abbreviation for U.S. Pharmacopoeia, usually used in reference to purity standard for medicinal white oils, or white oils that will come in contact with food.
Viscosity	A measure of the resistance to flow, or internal friction, of a fluid. Viscosity changes with temperature so the temperature at which the measurement was made must always be specified.
Viscosity Index (VI)	An arbitrary scale which indicates how the viscosity of a fluid varies with changes in temperature. The higher the VI the less the viscosity changes with temperature and vice versa.
VI Improvers	Additives which increase the viscosity index of mineral oils thereby decreasing the effects of temperature on the lubricant.
Volatility	The ease with which a liquid is converted into its vapour state.
Wetting Agent	Compound having the property of modifying the characteristics of the contact between a liquid and a solid surface to promote more rapid and complete wetting of the surface.
Worked Penetration	The penetration of a sample of lubricating grease immediately after it has been brought to 25 °C and then subjected to 60 strokes in a standard grease worker.

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CALTEX

For further information call the Lubelink Advisory Service on 1300 364 169
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