



CALTEX®



A guide to Caltex products

Lubricants, fuels and more

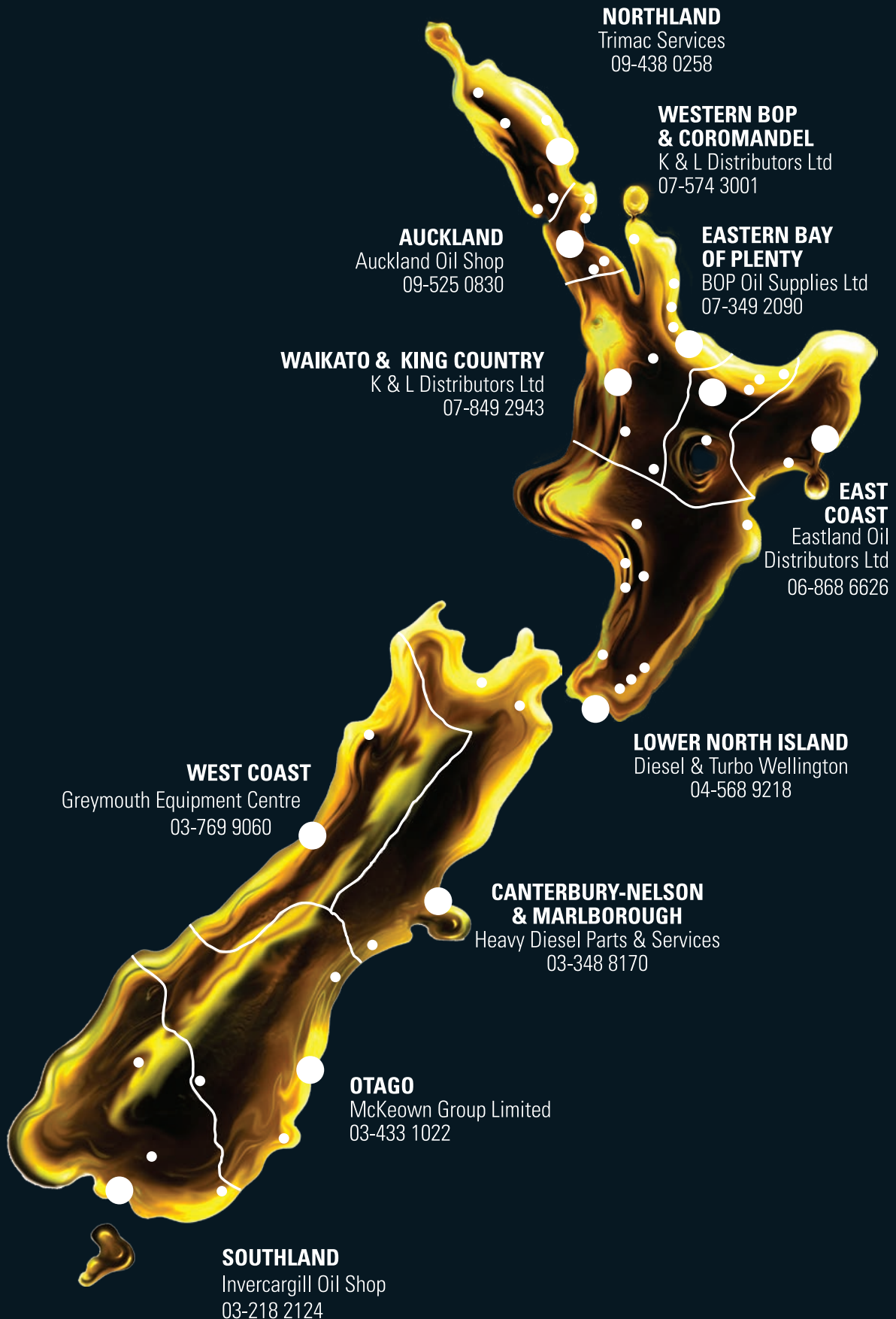


Havoline **Delo**

Caltex Oil Shop Network



CALTEX®



Premium quality oil available nationwide

Caltex Product Information Guide



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Note: This document is a guide only and was prepared in good faith from the best information available at the time of issue. While the values and characteristics are considered representative, some variation, not affecting performance, can be expected. It is the responsibility of the user to ensure that the products are used in the applications for which they are intended. Please refer to the manufacturers recommendations to confirm.

Individual Product Data Sheets can be accessed by going on-line at <https://cgjapps.chevron.com/msdspds/HomePage.aspx>

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For **PRODUCT** or **APPLICATION** information, visit website <http://caltex.co.nz/products-and-services/lubricants/> or email lubricants@z.co.nz or contact your local Lubricant Distributor Phone - 0800 372 374



Caltex Premium with Techron

A highly refined, premium grade unleaded petrol designed for use in all petrol-fuelled spark-ignition engines in mobile, portable and stationary applications. It has an octane rating of 95 minimum, which makes it ideal for vehicles that require unleaded petrol with octane ratings higher than the commonly available 91. It is also ideal for those cars, which experience engine knocking or run-on problems when using 'regular' unleaded petrol.

Caltex Premium with Techron contains an advanced, proprietary deposit control additive that cleans up harmful intake and fuel system deposits, and can also keep these deposits forming in new engines to ensure they operate at peak performance and efficiency. Volatility characteristics are carefully adjusted seasonally to ensure easy cold starting and protection from vapour lock and carburettor icing. Caltex Premium with Techron is coloured yellow and meets the New Zealand Petroleum Products Specifications Regulations.

Caltex Regular with Techron

A highly refined regular grade unleaded petrol designed for use in all petrol-fuelled spark-ignition engines in mobile, portable and stationary applications. It contains the same additive system as Caltex Premium with Techron to ensure total fuel system cleanliness so that engines operate at peak performance and efficiency. Volatility characteristics are carefully adjusted seasonally to ensure easy cold starting and protection from vapour lock and carburettor icing. Caltex Regular with Techron has an octane rating of 91 minimum, is coloured Red and meets the New Zealand Petroleum Products Specifications Regulations.

NOTE: Motor petrol's are NOT suitable for aircraft use.

Automotive LPG

A premium quality, clean burning, liquefied petroleum gas. It is an unleaded high octane fuel suitable for all currently available automotive LPG engines or dual fuel LPG/petrol engines. It meets the New Zealand Standard NZS 5435 (specification for LPG), has a gross energy per unit mass of 50 MJ/kg and an octane rating of approximately 99.

Regular Kerosine

Caltex Regular Kerosine is a product intended for use as a general purpose cleaning solvent and as a fuel in most flued domestic heating appliances employing vaporising or atomizing burners.

Jet-A1

A kerosine-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 91-91/3 and the AFQRJOS Joint Fuelling Check List.

Caltex Diesel with Techron® D

A premium performance, deposit control diesel fuel designed for use in diesel engines in automotive and industrial applications. The exclusive Techron® D additive controls deposits, maintains fuel injector cleanliness and protects metal fuel system components against corrosion and has been tested in both the latest and older technology engines and in a range of diesel specifications including biofuel blends.

It is also used in domestic and smaller industrial automatic heating systems equipped with gun type burners.

It meets the requirements of the New Zealand Petroleum Products Specifications Regulations and may be used when EN590, ASTM D975 No. 2D and JISK 2204 No. 1 diesel fuel is specified. It has a net energy per unit volume of approximately 45.9 MJ/kg. Sulphur Content mg/kg = <10.



Caltex Premium with Techron

A broad range of residual fuels for marine bunkering, industrial applications, steam and electrical power generation boilers, and large central heating applications. For lighter grades preheating is not normally required for handling and burning; the medium grades may require preheating, depending on climatic conditions, and the heavier grades require heating for both handling and burning. Further details of the range are available upon request.

Typical Characteristics of Caltex Fuels

Product	Product Codes	Density kg/L @ 15° C	Flash Point °C	Freezing, Cloud or Pour Point °C	Research Octane Number	Cetane Index	Sulphur % mass Mg/kg	Lead Mg/L	Colour
Caltex Premium with Techron	390100	0.75	-40	-	95	-	18	<1	Yellow
Caltex Regular with Techron	380100	0.74	-40	-	91	-	41	<1	Red
Automotive LPG	150029	0.53	-60	-	99	-	-	-	-
Regular Kerosene	400234	0.808	41	-	-	40	0.02	-	-
Jet-A1	440100	0.81	43	Freeze-Point -52	-	-	0.02	-	Clear
Diesel	850100	0.835	71	Cloud point (summer) 3	-	55	<10	-	Pale to light green
Fuel Oil Light	930100	0.920	103	Pour Point -11	-	-	1.8	-	Black
Fuel Oil Heavy	950100	0.952	105	Pour Point -1	-	-	2.5	-	Black

PETROL ENGINE OILS



Havoline® Energy

500210

SAE Grade:	5W-30
Performance Standards:	API: SL/CF; ACEA: A1/B1; A5/B5; Ford: WSS-M2C913-C, M2C913-D, Renault RN 0700
Description:	Havoline® Energy is a premium performance, friction modified multigrade motor oil formulated from high performance additive technology and fully synthetic base oils, for use in modern passenger car and light truck petrol engines to promote engine durability and improved fuel economy.
Application:	Recommended for naturally aspirated and turbocharged petrol engines where the manufacturer requires a low viscosity multigrade oil or where superior fuel efficiency is desired.
Pack sizes:	208 litres, 4 litre and 1 litre.



Havoline® Ultra V

501272

(To be renamed Havoline® ProDS V in late 2017)

SAE Grade:	5W-30
Performance Standards:	ACEA C3; VW Standard 504 00 and 507 00; BMW Longlife-04; Mercedes Benz 229.51 and 229.31; Porsche Oil Category C 30
Description:	Havoline® Ultra V is an enhanced performance, synthetic, multigrade motor oil formulated from selected base fluids and high performance additive technology for use in passenger car and light truck petrol and diesel engines under all operating conditions.
Application:	For use in naturally aspirated and turbocharged petrol and diesel engines in passenger cars and light trucks including those fitted with the latest catalytic converter (petrol) or diesel particulate filter (DPF) technology. Particularly suited for use in the latest Volkswagen and Audi petrol and diesel engines.
Pack sizes:	20 litres.

Havoline® Ultra R

501276

SAE Grade:	5W-30
Performance Standards:	ACEA C4; Renault RN 0720; Mercedes Benz 226.51
Description:	Havoline® Ultra R is a low SAPS, premium performance engine lubricant formulated with synthetic base stocks and advanced technology additives and is designed to perform under severe operating conditions as defined by the engine manufacturer.
Application:	Recommended for use in high performance naturally aspirated and turbocharged car and light van diesel and petrol engines equipped with modern three way catalysts (TWC) and diesel particulate filters (DPF) requiring low SAPS oils. Approved to ACEA C4 which is specifically required by Nissan in a range of their late model diesel engines fitted with DPF's.
Pack sizes:	5 litres.



Havoline® ProDS Fully Synthetic ECO 5

SAE 0W-20 - 500285
SAE 5W-30 - 500286

- SAE Grade:** 0W-20 & 5W-30
- Performance Standards:** API: SN; API Resource Conserving; ILSAC GF-5; GM: dexos1™ (licence GB1D1017089 for SAE 0W-20 & GB1C0930089 for SAE 5W-30).
- Description:** Havoline® ProDS Fully Synthetic ECO 5 is a resource conserving, multigrade petrol engine oil formulated with synthetic base oils for use in passenger car and light truck engines requiring low viscosity, ILSAC GF-5, API SN or GM dexos1™ performance lubricants under all operating conditions.
- Application:** Naturally aspirated and turbocharged petrol engines in passenger cars where ILSAC GF-5, API SN, GM dexos1™ or earlier ILSAC or API "S" performance categories are specified.
- Pack sizes:** SAE 5W-30 available in 200 litre, 18 litre, 4 litre and 1 litre.
 SAE 0W-20 available in 4 litre packs only



Havoline® ProDS F

(NEW PRODUCT)

500266

- SAE Grade:** 5W-20
- Performance Standards:** API: SN; ACEA: A1/B1; ILSAC GF-5; Ford WSS-M2C 948-A, Ford WSS-M2C 945-A, Ford WSS-M2C- 948-B.
- Recommended for:** Ford WSS-M2C 913-C, WSS-M2C 913-A, WSS-M2C 925-B petrol engines; Jaguar Land Rover applications requiring ST-JLR 03.5004
- Description:** Havoline® ProDS F is a premium performance, passenger car engine oil formulated with premium quality synthetic based oils in combination with an advanced additive system.
- Application:** Specifically developed for use in direct injected, turbocharged, 1.0 L 3-cylinder Ford Ecoboost engines requiring Ford WSS-M2C 948-A but also suitable for engines requiring the other Ford specifications listed above.
- Pack sizes:** 208 litre, 20 litre, 4 litre and 1 litre.

Havoline® ProDS Fully Synthetic LE

500002

- SAE Grade:** 5W-40
- Performance Standards:** API: SN; ACEA: C3; MB Approval: 229.51; Meets RN 0710/0700 performance; Porsche: A40 approval; BMW Longlife-04 approval; GM dexos2™ (license GB2D0320089).
- Description:** Havoline® ProDS Fully Synthetic LE is a premium performance, multigrade motor oil formulated from selected synthetic base fluids and matching additive technology. It is optimised to provide outstanding protection and value for cleaner, smoother-running engines.
- Application:** Specifically developed for use in low emission passenger car and light duty vehicle engines fitted with the latest catalytic converter (petrol) or diesel particulate filter technology and specifically where ACEA C3 oils are recommended.
- Service Considerations:** In December 2012, ACEA amended its some of its definitions such that ACEA C3 has become mutually exclusive with ACEA A3/B3 and A3/B4. The changes were made to emphasise the fact that today, the ACEA A3/B3 and A3/B4 Sequences are primarily intended for applications where lower quality, higher sulphur content fuels are in use. Thus ACEA A3/B3 and A3/B4 claims are no longer made for Havoline ProDS Fully Synthetic LE SAE 5W-40, which is primarily an ACEA C3 oil. However, it remains suitable for use in those applications calling for ACEA A3/B3 or A3/B4 oils where it has previously been used, and where low sulphur fuels are being burned.
- Pack sizes:** 200 litre, 18 litre, 4 litre and 1 litre.





Havoline® Synthetic Blend with DEPOSIT SHIELD

500005

SAE Grade: 10W-40
Performance Standards: API: SN (licensed); ACEA: A3/B4, A3/B3; Mercedes-Benz: 229.3; Approved under VW Standard 502.00 and 505.00

Description: Havoline® Synthetic Blend is a high performance, multigrade motor oil formulated from a special blend of selected mineral oils, synthetic base fluids and matching additive technology. It is formulated **with Deposit Shield™** which is an advanced detergent formula that helps prevent deposit build-up for improved oil stability and increased engine durability.

Application: Suitable for most modern high performance naturally aspirated and turbocharged petrol and diesel engines in passenger cars and light trucks, where the applicable API and ACEA performance rated products are recommended.

Not recommended for use in petrol or diesel engines that require ACEA A1/B1, A5/B5 or C-series oils, or in any motorcycle engines.

Pack sizes: 200 litre, 18 litre, 4 litre, 1 litre.



Havoline® Formula with DEPOSIT SHIELD

500007

SAE Grade : 10W-30
Performance Standards: API: SN; API Resource Conserving; ILSAC: GF-5

Description: Havoline® Formula is a highly shear stable, multigrade petrol engine oil and is formulated **with Deposit Shield™** which is an advanced detergent formula that helps prevent deposit build up for improved oil stability and increased engine durability. It provides superior viscosity control that helps maintain engine power and preserve fuel economy.

Applications: Recommended for use in both naturally aspirated and turbocharged petrol engines in passenger cars and light commercial vehicles including those with sophisticated valve train mechanisms and variable valve timing. Also suitable for engines fuelled by LPG or CNG or fitted with gas/petrol dual fuel systems including industrial lift trucks where an SAE 10W-30 is required.

Not recommended for use in diesel engines or motorcycle engines.

Pack sizes: 200 litre, 4 litre.



Havoline® Formula with DEPOSIT SHIELD

500009

SAE Grade : 15W-40
Performance Standards: API: SN

Description: Havoline® Formula is a highly shear stable, multigrade petrol engine oil and is formulated **with Deposit Shield™** which is an advanced detergent formula that helps prevent deposit build up for improved oil stability and increased engine durability.

Applications : Recommended for use in both naturally aspirated and turbocharged petrol engines in passenger cars and light commercial vehicles including those with sophisticated valve train mechanisms and variable valve timing. Also suitable for engines fuelled by LPG or CNG or fitted with gas/petrol dual fuel systems including industrial lift trucks where an SAE 15W-40 is required.

Not recommended for use in diesel engines or motorcycle engines.

Pack sizes: 200 litre, 18 litre, 4 litre, 1 litre, 500 ml.





Havoline Motor Oil

SAE 15W-40 - 500015
SAE 20W-50 - 500016

SAE Grade: 15W-40 and 20W-50
Performance Standards: API: SJ, SH, SG /CD.

Description: Havoline Motor Oil is a high quality, shear-stable, multigrade engine oil for use in a wide range of passenger car and light duty commercial vehicles. It provides a high level of protection against starting friction, heat stress and engine deposits.

Application: Suitable for passenger car and light duty commercial vehicle petrol engines and industrial and marine applications where oils up to API SJ performance are required.

Not recommended for use in petrol engines that require API SL or higher performance or ACEA-classified oils, or in any gas-fuelled (LPG) engines, diesel engines or motorcycle engines.

Pack sizes: SAE 15W-40 available in 4 litre and 200 litre drum.
SAE 20W-50 available in 4 litre pack only.



Havoline® SF Engine Oil

500272

SAE Grade: 20W-40

Performance Standards: Suitable for use where API SF or API SF/CD oils are specified for use in petrol engines.

Description: Havoline SF is an economy petrol engine oil formulated to protect against wear, deposits, rust and corrosion.

Application: Designed for older passenger cars where operating conditions are mild and oils meeting API SF are acceptable.

Not recommended for use in gas-fuelled (LPG) engines, diesel engines or motorcycle engines.

Pack sizes: 4 litre.

Havoline® Super 4T

500712

SAE Grade: 20W-40

Performance Standards: JASO MA2 (2006); API SL.

Description: Havoline Super 4T is a premium performance, shear stable, multigrade, multifunctional fluid specifically designed for use in **four-stroke motorcycle engines**, clutches and gearboxes, and portable power equipment engines requiring JASO MA2 or MA, API SL lubricants, including high specific output engines operating in severe service.

Application: Air and liquid cooled **four-stroke motorcycles engines** and particularly suitable for Japanese high performance motorcycle engines. Suitable for motorcycles with catalytic converters and the latest generation four-stroke scooter engines. Motorcycles with and without oil immersed clutches.

Pack sizes: 1 litre.



PETROL ENGINE OILS



Four Stroke Lawnmower and Stationary Engine Oil

501601

- SAE Grade:** 30
- Performance Standards:** API: SJ/CF.
- Description:** A high performance monograde SAE 30 engine oil intended primarily for the lubrication of petrol engines requiring an API SF performance lubricant and suitable for small diesel engines where an API CF performance is specified.
- Application:** Recommended for four stroke petrol lawn mower engines and for other small four stroke petrol and diesel stationary engines, such as generator sets and portable power equipment.
- Pack Sizes:** 1 litre.



TWO STROKE ENGINE OILS

Super Outboard 3 (Green)

560319

- SAE Grade:** 20 (Pre-diluted).
- Performance Standards:** National Marine Manufacturers Association (NMMA): TC-W3 Certified
- Description:** A premium performance, two-stroke, marine outboard motor oil formulated with a special ashless additive system that ensures that ash-induced deposits are not formed in the combustion chamber thereby eliminating the risk of destructive pre-ignition from this source. Pre-diluted with a high flash point solvent to facilitate mixing with petrol at all temperatures. Dyed green.
- Application:** Recommended for all water-cooled, two stroke, marine outboard engines including the latest designs under warranty, including Johnson, Mercury, Evinrude, Yamaha etc. Suitable for both oil-injected and oil-petrol premix engines at petrol-to-oil ratios up to and including 100:1.
- Pack sizes:** 4 litre, 1 litre.



Havoline® Super 2T

500676

- SAE Grade:** 20 (Pre-diluted)
- Performance Standards:** JASO: FC (identification No. 061CTC684/5); ISO: EGC; API: TC
- Description:** A premium performance, "low smoke", semi-synthetic, two-stroke motorcycle oil formulated with a special low ash additive system and base fluids that provide superior lubricity to reduce wear.
- Application:** Air and liquid cooled two-stroke motorcycle engines and particularly Japanese high performance motorcycle engines. Also suitable for Japanese two stroke engines fitted to stationary and portable power equipment, lawn mowers etc.
- Suitable for use in chainsaws - has been successfully field tested in Stihl chainsaws in severe duty forestry applications and is recommended for use in all Stihl chainsaws.
- Suitable for oil-injected engines and oil-petrol premix engines at petrol-to-oil ratios up to 50:1.
- It is NOT recommended for use in marine outboard engines, or any LPG fuelled engines.*
- Pack sizes:** 20 litre, 4 litre, 1 litre.



PETROL ENGINE OILS



Two Stroke Lawnmower Oil

501600

SAE Grade: 20 (Pre-diluted).

Performance Standards: JASO: FB ; ISO : EGB.

Description: A two stroke all-mineral motor oil designed for two stroke lawn mower petrol engines. Pre-diluted with a high flash point solvent to facilitate easy mixing with petrol.

Application: Recommended for two stroke petrol engine lawn mowers and other small air cooled two stroke engines both oil-injected and oil-petrol pre-mix engine up to 50:1 ratios.

Pack sizes: 200ml.



TRACTOR OILS

Super Tractor

500421

SAE Grade: 15W-40

Performance Standards: API: CF, CF-4/SF, API: GL-4; ZF TE-ML 06B, 07B.
Suitable for use where the following are specified: Ford: ESN-M2C159-B2; Ford New Holland: FNH 820092102, 890092103; Massey Ferguson: CMS M1144; New Holland NH 024C

Description: A shear stable, multi-viscosity super tractor oil universal (STOU) fluid, designed for use in tractor engine crankcases, transmissions (including wet brakes), final drives and hydraulic systems.

Application: A multi-functional oil suitable for:

- Where the tractor manufacturer specifies the use of an STOU type product.
- Mixed fleets of agricultural tractors and associated equipment.
- Mobile or stationary diesel engines.
- Older style petrol engines.
- Automotive manual transmissions and gearboxes.
- Mobile hydraulic systems.
- Enclosed oil immersed (wet) brakes.
- Power take off (PTO) clutches.

Pack sizes: 200 litre, 18 litre.





Typical Characteristics

Product	Code	SAE Grade	Density @ 15°C kg/L	Flash Point °C	Pour Point °C	Viscosity cSt @		Viscosity Index	TBN mgKOH/g	Sulphated Ash %m
						40°C	100°C			
Four Stroke Lawnmower Oil	501601	30	0.867	248	-39	89.9	11.5	118	6.8	0.80
Havoline Energy	500210	5W-30	0.854	-	-36	51.0	9.5	174	-	1.10
Havoline Formula SAE 10W-30	500007	10W-30	0.870	228	-40	67.8	10.2	132	8.7	0.96
Havoline Formula SAE 15W-40	500009	15W-40	0.875	238	-34	117	15.1	136	8.4	0.95
Havoline Formula SAE 20W-50	500010	20W-50	0.876	240	-32	170	19.1	129	8.4	0.95
Havoline Motor Oil	500016	20W-50	0.880	285	-27	167	19.1	130	5.7	0.88
Havoline ProDS ECO 5	500285	0W-20	0.849	232	-45	42.9	8.19	168	8.7	0.90
Havoline ProDS ECO 5	500286	5W-30	0.850	230	-38	66.3	11.0	165	8.9	0.90
Havoline ProDS F	500266	5W-20	0.832	234	-39	45.0	8.4	162	-	-
Havoline ProDS Fully Synthetic LE	500002	5W-40	0.852	236	-42	84	13.8	168	7.8	0.80
Havoline SF Engine Oil	500272	20W-40	0.872	246	-21	133	15.1	115	6.6	0.80
Havoline Super 2T	500676	20 pre-diluted)	0.857	93	-38	59.2	9.4	141	-	0.13
Havoline Super 4T	500712	20W-40	-	-	-30	118	14.3	122	7.7	0.99
Havoline Synthetic Blend	500005	10W-40	0.876	230	-39	91.0	13.7	153	10.9	1.20
Havoline Ultra R	501276	5W-30	0.853	233	-39	67.1	11.5	167	-	-
Havoline Ultra V	501272	5W-30	-	-	-	69	11.9	168	7.0	0.7
Super Outboard 3 [Green]	560319	20 pre-diluted)	0.874	102	-39	56.2	9.13	125	-	<0.01
Super Tractor	500421	15W-40	0.876	228	-35	113	15.1	139	10.1	1.40

DIESEL ENGINE OILS



The lubrication requirements of modern heavy duty automotive, industrial and marine engines may vary considerably due to differences in engine type, design, operating conditions and service classification required. Caltex markets a complete range of high performance engine oils, both monograde and multigrade, to meet the above requirements. These oils incorporate the latest technology and are blended from selected base stocks and additives to ensure that they meet the needs of the most severe operating conditions.

DIESEL ENGINE OILS

Delo® 400 SDE

(NEW PRODUCT)

500635

SAE Grade: 15W-40

Performance Standards: API: CK-4, CJ-4, CI-4 PLUS, CI-4, CH-4/SN; ACEA: E9; Caterpillar: ECF-3; Volvo: VDS-4.5; Mack: EOS 4.5; Renault RLD-4; DEUTZ DQC III-10 LA; Daimler MB: 228.31; Cummins: CES 20086; MAN: M 3575; MTU Category 2.1; Detroit Fluids Specification (DFS) 93K222; ZF TE-ML 04C; JASO DH-2.

Description: Delo 400 SDE SAE 15W-40 is formulated with ISOSYN Advanced Technology, which is the combination of Chevron's industry leading formulating expertise with unique, high performance additive chemistry to help extend the durability of critical diesel engine parts.

Application: Specifically designed for the latest low emission diesel engines fitted with Diesel Particulate Filters (DPF's) but also those fitted with EGR and/or SCR systems. Suitable for mixed fleets of European, North American and/or Japanese diesel engines of both old and new equipment in applications that include long distance trucking, earthmoving, off-highway, stationary plant, mining and agricultural operations.

Suitable for use in vehicles meeting the most recent exhaust emissions standards, including US EPA 2002 and 2007, Euro IV, V and VI and Australian ADR 80/02 (for medium duty) and ADR 80/03 (for heavy duty).

Pack sizes: 208 litre, 18.9 litre.

Delo® 400 MGX

(NEW PRODUCT)

500634

Replaces Delo 400 LE and Delo 400 Multigrade

SAE Grade: 15W-40

Performance Standards: API: CJ-4, CI-4 PLUS, CI-4, CH-4/SM; ACEA: E9, E7; Caterpillar: ECF-3, ECF-2; Volvo: VDS-4; Renault VI RLD-3; Mack: EO-O Premium Plus; DEUTZ DQC III-10 LA; Daimler MB: 228.31; Cummins: CES 20081; MAN: M 3575; MTU Category 2.1; Detroit Diesel: 93K218.

Meets the requirements of: JASO DH-2; Ford: WSS-M2C171-E

Description: An API CJ-4 heavy duty diesel engine oil specifically formulated for on-highway and off-highway applications using either High Sulphur or Low Sulphur Diesel fuel operating under the most severe service conditions. Formulated with ISOSYN base oils and the latest low-ash additive technology to provide exceptional soot dispersancy, deposit control and wear protection.

Application: Provides protection for newer compliant low emission diesel engines with Selective Catalytic Reduction (SCR), Diesel Particulate Filter (DPF) and Exhaust Gas Recirculation (EGR). Suitable for mixed fleets of European, North American and/or Japanese diesel engines of both old and new equipment in applications that include long distance trucking, earthmoving, off-highway, stationary plant, mining and agricultural operations.

Suitable for vehicles meeting the most recent exhaust emissions standards, including US EPA 2002 and 2007, Euro IV, V and VI, and Australian ADR 80/02 (for medium duty) and ADR 80/03 (for heavy duty).

Pack sizes: 200 litre, 18 litre, 5 litre, 1 litre.



DIESEL ENGINE OILS



Delo® 400 LE

(DISCONTINUED)
replaced by Delo 400 MGX

500528



- SAE Grade:** 15W-40
- Performance Standards:** API: CJ-4, CI-4 PLUS, CI-4, CH-4, CF/SM; ACEA: E9, E7; Caterpillar: ECF-3, ECF-2; Volvo: VDS-4; Renault RLD-3; Mack: EO-O Premium Plus 07; DEUTZ DQC III-10 LA; Daimler MB: 228.31; Cummins: CES 20081; MAN: M3575; MTU Category 2.1; Detroit Diesel: 93K218.
- Meets the requirements of: API CF; ACEA E5-02, E3-96; JASO DH-2; Ford: WSS-M2C171-E**
- Description:** A premium performance “low-SAPS” (Sulphated Ash, Phosphorus and Sulphur), heavy-duty diesel engine oil specially designed to lubricate a wide range of high speed diesel engines operating under the most severe service conditions. Formulated with ISOSYN base oils and the latest low-ash additive technology to provide exceptional soot dispersancy, deposit control and wear protection.
- Application:** Specifically designed for the latest low emission diesel engines fitted with Diesel Particulate Filters (DPF’s) but also those fitted with EGR and/or SCR systems.
- Suitable for mixed fleets of European, North American and/or Japanese diesel engines of both old and new equipment in applications that include long distance trucking, earthmoving, off-highway, stationary plant, mining and agricultural operations. Suitable for use in vehicles meeting the most recent exhaust emissions standards, including US EPA 2002 and 2007, Euro IV, V and VI and Australian ADR 80/02 (for medium duty) and ADR 80/03 (for heavy duty).
- Pack sizes:** 200 litre, 18 litre, 5 litre, 1 litre.

Delo® 400 XLE Synblend

500289

- SAE Grade:** 10W-30
- Performance Standards:** API: CK-4, CJ-4, CI-4 PLUS, CI-4/SN; ACEA: E6, E9; Volvo: VDS-4.5; Renault RLD-4; Mack: EOS 4.5; DEUTZ DQC III-10 LA; Cummins: CES 20086; Detroit Fluid Specification (DFS) 93K222; Caterpillar ECF-3; MB: 228.51, 228.31; MTU Category 2.1; MAN: M 3575; ZF TE-ML 03K
- Description:** Delo® 400 XLE SAE 10W-30 with ISOSYN® Advanced Technology is formulated using advanced additive technology to provide outstanding protection and improved fuel efficiency for on highway applications including 2010 compliant engines.
- Application:** Excellent performance in new advanced engines developed to meet the latest emissions and reliability standards and in engines equipped with features like four-valve heads, super-charging, turbo-charging, direct injection, higher power density, intercooling, full electronic management of fuel and emissions systems, exhaust selective catalytic reduction, exhaust gas recirculation, and exhaust particulate filters.
- Pack sizes:** 208 litre, 18.9 litre.

Delo® 400 Multigrade

(DISCONTINUED)
replaced by Delo 400 MGX

500499



- SAE Grade:** 15W-40
- Performance Standards:** API: CI-4 PLUS, CI-4, CH-4/SL; ACEA: E7-08; JASO: DH-1; EMA Global DHD-1; Caterpillar ECF-2, ECF-1-a; Cummins: CES 20078, 20077, 20076; DDC 93K214; Mack: EO-N Premium Plus 03; Daimler MB Approval: 228.3; Volvo: VDS-3; Renault: RLD-2; DEUTZ: DQC III-10; MAN: M3275; DDC/MTU: Category 1 and 2
- Planned Approvals:** ZF: TE-ML 04C, 07C
- Meets the requirements of:** API CG-4, CF-4, CF, CD; Cummins: CES 20072; Mack: EO-M Plus, EO-M; ACEA: E5- 02, E3-96.

DIESEL ENGINE OILS



- Description:** A premium performance, multigrade, heavy-duty diesel engine oil specifically designed to lubricate a wide range of diesel engines operating under the most severe service conditions. Formulated with ISOSYN technology to provide exceptional soot dispersancy, deposit control and wear protection.
- Application:** Specifically designed for the latest electronically controlled diesel engines, including those fitted with EGR and/or SCR systems. "Universal" formulation provides excellent overall performance in mixed fleets of different engine designs of both old and new equipment. Recommended for commercial road transport, including those designed to meet Euro III emission standards and also for Euro IV and V compliant vehicles, except those units fitted with diesel particulate filters and requiring ACEA E6 or E9 oils. For engines with diesel particulate filters, Delo 400 MGX, Delo 400 SDE, Delo 400 LE, Delo 400 XLE Synblend or Delo XLE Multigrade (Ursa Ultra XLE) should be selected in accordance with the manufacturer's recommendations.
- Pack sizes:** 200 litre, 18 litre.

Delo® Gold Ultra

500574

- SAE Grade:** 15W-40
- Performance Standards:** API: CI-4, CH-4/SL; ACEA: E7-08; Volvo: VDS-3; Renault: RLD-2; Mack: EO-N Premium Plus; Daimler MB: 228.3; MAN: M 3275-1; DDC/ MTU: Category 2; Caterpillar ECF-1-a; Cummins: CES 20078, 77, 76.
- Meets the requirements of:** API CF-4,CF, CD; ACEA: E5-02; Cummins: CES 20072,71; JASO DH-1.

- Description:** A high performance, multigrade, heavy-duty diesel engine oil specifically designed to lubricate a wide range of engines requiring API CI-4 or ACEA E7 performance lubricants, including those fitted with EGR and/or SCR systems. Formulated with ISOSYN® technology.
- Application:** Recommended for mixed fleets of both diesel and petrol engines in the commercial road transport, off-highway vehicles and plant, agricultural tractors and farm machinery, generator sets, and high speed diesel engines in marine service. May also be used in non-engine applications where an SAE 15W-40 engine oil is specified, such as transmissions and hydraulic systems.
- Pack sizes:** 200 litre, 18 litre, 5 litre, 1 litre.



Delo® Gold Monograde

500639

- SAE Grade:** 30
- Performance Standards:** API: CF/SJ; ACEA: E2-96; Daimler MB Approval: 228.2; Mack: EO-K/2; MAN 270; DDC/MTU Category 2.

- Description:** A monograde, heavy-duty diesel engine oil formulated with high performance base fluids and the latest additive technology to provide exceptional soot dispersancy, deposit control and wear protection.
- Application:** Recommended for use in both light and heavy duty high-speed four-stroke, turbocharged or naturally aspirated diesel engines as well as four-stroke petrol engines in mixed fleet applications where a monograde oil is preferred. Applications include commercial road transport, off-highway vehicles, agricultural tractors, high speed diesel engines in marine service and generator sets. Also suitable for use in non-engine applications where an SAE 30 engine oil is specified, such as manual transmissions and hydraulic systems.
- Pack sizes:** 200 litre, 18 litre.





Delo® Silver Multigrade

500549

- SAE Grade:** 15W-40
- Performance Standards:** API: CF-4, CF/SG
- Description:** A multigrade, heavy-duty diesel engine oil providing good protection for older diesel and petrol engines.
- Application:** Designed for naturally aspirated and turbocharged diesel and petrol engines requiring API CF-4 or SG performance lubricants.
- Pack sizes:** 18 litre, 5 litre.



Delo® XLE Multigrade

(DISCONTINUED)
Replaced by Ursa Ultra XLE SAE 10W-40

500545

Ursa® Ultra XLE

(NEW PRODUCT)
Replaces Delo XLE Multigrade

500918

- SAE Grade:** 10W-40
- Performance Standards:** ACEA E4, E6, E7, E9; API: CJ-4; Scania Low Ash; MB Approval: 228.51, 228.31; Renault VI RLD-3, VI RLD-2; MAN: M 3477, M 3575, M3271-1; Mack: EO-O Premium Plus; Volvo: VDS-4; JASO DH-2; Caterpillar ECF-3; Cummins 20081; Detroit Diesel 93K 218; MTU Type 3.1, 2.1; Voith Retarder B.
- Suitable for:** Applications requiring Renault VI RGD, RXD, RD, RD-2, RLD; Iveco Euro VI engines; DAF extended drain (Euro III, IV, V & VI engines).
- Description:** Ursa® Ultra XLE is formulated with advanced low SAPS additive technology designed to meet Euro VI emission requirements of Volvo, Scania, Daimler, DAF and Iveco engines, and offers backward compatibility with legacy engine technology, meeting both full SAPS and lower SAPS specifications where permitted by OEMs.
- Application:** Recommended for diesel engines meeting Euro IV, Euro V and the newest Euro VI emission requirements where permitted by the OEM and is suitable for use in engines with global after treatment systems such as exhaust gas recirculation (EGR), diesel particulate filter (DPF), and selective catalytic reduction (SCR).
- Pack sizes:** 208 litre, 20 litre.

Delo® XSD Synthetic

500461

- SAE Grade:** 10W-40
- Performance Standards:** ACEA E4, E7; API: CF; MB Approval: 228.5; MAN: M3277, Scania: LDF-3, LDF-2; Volvo: VDS-3; Renault RLD-2; Mack: EO-N.
- Description:** Delo® XSD Synthetic is a high performance synthetic heavy duty diesel engine lubricant designed to meet current ACEA requirements and the more challenging OEM specifications, including Scania LDF-3 for their latest technology Euro VI engines.
- Application:** Heavy duty, naturally aspirated and turbocharged high speed, four stroke diesel engines operating internationally with long drain intervals and provides oil service levels up to the maximum levels recommended for ACEA E4 oils in Euro IV and Euro V compliant engines NOT fitted with diesel particulate filters (DPF's). Suitable for use in Scania Euro VI emissions diesel engines requiring Scania LDF-3 approved lubricants and is backward compatible and suitable for earlier European heavy duty diesel engines meeting Euro II to Euro V emission standards.
- Pack sizes:** 208 litre, 20 litre.



Delo® 6130 CFO

550040

SAE Grades: 40

Performance Standards: API: CF, CF-2; LMOA Generation 5; EMD (Internal Listing, Worthy of Full Scale Field Test), General Electric (Fundamental Approval)

Description: A premium performance, 13 Base Number, "zinc-free", LMOA Generation 5 diesel engine oil utilising chlorine-free additive technology, for use in railroad-type diesel engines and General Motors Detroit Diesel Corporation (DDC) two-cycle high speed diesel engines.

Application: Designed for:

- Detroit Diesel Corporation (DDC) two-cycle high speed diesel engines in on and off highway applications (Series 53, 71, 92 and 149 engines)
- Medium speed two and four-cycle railroad-type diesel engines.
- Including the most recent high out-put, low oil consumption designs, whether in railroad, stationary or marine service.
- EMD railroad diesel engines.
- General Electric railroad diesel engines

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

Not recommended for use in marine and other transmissions and gearsets where heavy duty diesel engine oils are customarily used

Pack sizes: 200 litres, 18 litres.

Delo® Silver Monograde

500585

SAE Grade: 10W

Performance Standards: API: CF,CD/SF

Description: A high quality, monograde, low viscosity, diesel engine oil designed primarily for use in hydraulic systems of mobile equipment. Contains effective anti-wear and oxidation inhibitor additives and protects the systems from rust and corrosion.

Application: Recommended for hydraulic systems of mobile and stationary equipment where the manufacturer recommends the use of engine-oil type hydraulic fluids. Generally not suitable for engine use unless an SAE 10W viscosity is recommended.

Pack sizes: 200 litre, 18 litre.





Typical Characteristics

Product	Code	SAE Grade	Density @ 15°C kg/L	Flash Point °C	Pour Point °C	Viscosity cSt @		Viscosity Index	TBN mgKOH/g	Sulphated Ash %m
						40°C	100°C			
Delo 400 LE	500528	15W-40	0.881	204	-30	132	15.7	125	9.3	1.00
Delo 400 MGX	500634	15W-40	-	-	-	112	14.7	135	9.9	1.0
Delo 400 Multigrade	500499	15W-40	0.870	230	-36	125	15.8	125	12.2	1.40
Delo 400 SDE	500635	15W-40	0.877	230	-46	112	14.7	135	10.3	0.98
Delo 400 XLE Syn-blend	500289	10W-30	0.868	234	-46	81	11.9	142	10.3	0.98
Delo 6130 CFO	550040	40	0.876	225 (min)	-12	144	14.7	101	13	105
Delo Gold Monograde	500639	30	0.880	-	-18 (max)	93.0	11.5	112	10.0	1.40
Delo Gold Ultra	500574	15W-40	0.878	235	-35	115	15.1	137	10.2	1.40
Delo Silver Multigrade	500549	15W-40	0.876	221	-27	112	15.2	130	10.3	1.30
Delo Silver Monograde	500585	10W	0.883	225	-30	38.8	6.5	105	9.6	1.20
Ursa Ultra XLE	500918	10W-40	0.855	228	-33	92.2	13.8	163	-	1.0
Delo XLE Multigrade	500545	10W-40	0.860	238	-42	98.0	14.5	154	10.0	1.00
Delo XSD Synthetic	500461	10W-40	0.866	-236	-27	89.7	13.2	152	15.9	1.8



Delo® 1000 Marine

SAE 30 - 560010

SAE 40 - 560011

SAE Grades:	30, 40
TBN:	12.
Performance Standards:	Approved by major manufacturers for use in their medium-speed engines, including MAN diesel and Wartsila.
Description:	A lower alkaline reserve trunk piston engine oil (TPEO) providing 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. Excellent water separation characteristics enable water to be centrifuged out with essentially no loss of additive.
Application:	Designed for: <ul style="list-style-type: none">• Medium-speed trunk piston engines burning distillate fuels with sulphur content up to 1.5% in stationary power plant service.• Medium-speed trunk piston engines burning distillate fuels with sulphur content up to 1.5% in marine main and auxiliary power plant service.
Pack sizes:	200 litres

Delo® 6130 CFO

550040

SAE Grades:	40
Performance Standards:	API: CF, CF-2; LMOA Generation 5; EMD (Internal Listing, Worthy of Full Scale Field Test), General Electric (Fundamental Approval)
Description:	A premium performance, 13 Base Number, "zinc-free", LMOA Generation 5 diesel engine oil utilising chlorine-free additive technology, for use in railroad-type diesel engines and General Motors Detroit Diesel Corporation (DDC) two-cycle high speed diesel engines.
Application:	Designed for: <ul style="list-style-type: none">• Detroit Diesel Corporation (DDC) two-cycle high speed diesel engines in on and off highway applications (Series 53, 71, 92 and 149 engines)• Medium speed two and four-cycle railroad-type diesel engines.• Including the most recent high out-put, low oil consumption designs, whether in railroad, stationary or marine service.• EMD railroad diesel engines.• General Electric railroad diesel engines <p><i>Not suitable for use in marine-type engines equipped with active purification systems.</i></p> <p><i>Not recommended for use in marine and other transmissions and gearsets where heavy duty diesel engine oils are customarily used</i></p>
Pack sizes:	200 litres, 18 litres.

MARINE ENGINE OILS



Taro 30 DP

SAE 30 - 560059

SAE 40 - 560060

SAE Grades:	30, 40
TBN:	30
Service:	API: CF. (Listed by Caterpillar for 3600 Series engines exceeding 85% load factor (HFO))
Description:	Moderately high alkaline reserve trunk piston engine oil (TPEO) designed for use in high specific output medium speed trunk piston engines burning distillate fuels (up to 2.5% sulphur) .
Application:	Designed for: <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.• Certain crosshead type engines (where recommended by the manufacturer)• Cylinder lubrication in certain trunk piston engines with separate lubricators.
Pack sizes:	200 litres

Taro 40 XL 40

560062

SAE Grades:	40
TBN:	40.
Service:	API: CF. (Listed by Caterpillar for 3600 Series engines exceeding 85% load factor (HFO))
Description:	High alkaline reserve trunk piston engine oil (TPEO) designed for use in high specific output medium-speed trunk piston engines burning high sulphur residual fuels (over 2.5% sulphur).
Application:	Designed for: <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.• Certain crosshead type engines (where recommended by the manufacturer)• Cylinder lubrication in certain trunk piston engines with separate lubricators.
Pack sizes:	200 litres

MARINE CRANKCASE OIL

Veritas 800 Marine

560041

SAE Grade:	30
TBN:	5.4.
Service:	-
Description:	Moderately alkaline marine diesel engine oil.
Application:	Designed for: <ul style="list-style-type: none">• Crankcases of large, slow speed two stroke crosshead diesel engines.• Crankcases of low rated medium speed trunk piston engines with separate cylinder lubrication.• Also used for other shipboard applications such as hydraulic systems etc.
Pack sizes:	205 litres



MARINE CYLINDER OILS

Taro Special HT 70

560066

SAE Grade: 50.

TBN: 70.

Description: A single phase, highly alkaline marine diesel cylinder oil.

Application: Designed for marine and stationary crosshead diesel engines and trunk piston diesel engines with separate cylinder lubricators. It is particularly suitable for modern engines burning high sulphur residual fuels and operating with high specific outputs and thermal loads. Fully compatible with similar single phase cylinder lubricants.

Pack sizes: 200 litres

Typical Characteristics

Product	Code	ISO Grade	Density @ 15°C kg/L	Flash Point °C	Pour Point °C	Viscosity cSt @		Viscosity Index	TBN mgKOH/g	Sulphated Ash %m
						40°C	100°C			
Delo 1000 Marine 30	560010	30	0.900	245	-18	96	11.0	99	12	1.6
Delo 1000 Marine 40	501374	40	0.905	250	-12	137	14.0	98	12	1.6
Delo 6130 CFO	550040	40	0.900	225	-12	144	14.7	101	13	1.5
Taro 30 DP 30	560059	30	0.904	220	-9	96.8	11.1	100	30	3.6
Taro 30 DP 40	560060	40	0.908	230	-12	139	14	97	30	3.6
Taro 40 XL 40	560062	40	0.914	230	-21	139	14	97	40	4.8
Taro Special HT70	560066	50	0.926	240	-15	211	19.0	101	70	9.0
Veritas 800 Marine 30	560041	30	0.895	235	-9	108	11.9	96	5.4	0.7



Transmission fluids, especially automatic type fluids, are amongst the most complicated lubricants manufactured today. The properties required of them include: minimal viscosity change with temperature, anti-wear properties, thermal and oxidation stability, anti-corrosion properties, seal compatibility, anti-foam ability and correct frictional properties. With these requirements in mind Caltex transmission fluids are blended from selected base stocks and additives to meet the most severe operating conditions

AUTOMATIC

Autotrans Fluid BW

(DISCONTINUED)
replaced by *Havoline Full Synthetic Multi-Vehicle ATF*

511106

Havoline® ATF-J

510094

SAE Grade: 10W

Performance Standards: Meets JASO M315 Type 1-A
Suitable for use where the following fluid specifications are recommended:

- Mazda ATF M5
- Toyota T IV
- Nissan Matic J
- Mitsubishi Diamond SP III
- Honda ATF-Z1
- Subaru ATF



Description: A high performance, multipurpose, automatic transmission fluid formulated in hydrocracked base oils which provide outstanding oxidation resistance specifically engineered for Japanese passenger car automatic transmissions which require properties different to conventional ATF products.

Application: Suitable for automatic transmissions in many Japanese and Korean design passenger cars and light trucks and as service fill in automatic transmissions requiring DEXRON®-III or MERCON® fluids. Not recommended for use in CVT transmissions and power steering units.

Pack sizes: 200 litre, 18 litre and 1 litre.

Texamatic® 1888

510134

SAE Grade: 10W

Performance Standards: Voith Turbo: H55.6335 (G607 list).
Suitable for use where General Motors DEXRON® – III fluids or Ford MERCON® fluids are specified.

Description: A high performance, multipurpose, shear stable, anti-wear automatic transmission fluid 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).

Application: Recommended for the automatic transmission systems of many passenger cars, trucks, off-highway construction, mining and agricultural equipment, and other applications.

Also suitable for use in certain manual transmissions, power steering, rotary vane and screw type air compressors and hydraulic systems except where specialist fluids are required.

Pack sizes: 60 litre, 5 litre and 1 litre





Havoline® Full Synthetic Multi-Vehicle ATF

510126

(previously called Havoline Synthetic ATF Multi-Vehicle DEXRON VI)

SAE Grade: 10W

Performance Standards: Approved: GM DEXRON®-VI fluid (J-62103)
Meets: JASO M315 type 1A-LV (self-certified); ZF TE-ML 09 (self-certified)

Havoline Full Synthetic Multi-Vehicle ATF meets the requirements of:

- BMW Part #83 22 0 397 114
- FCA US LLC Part #68043742AA
- JASO 1A-LV13 (M315) performance standard in Japanese vehicles; the product will deliver the shifting performance, shear stability and exceptional anti-shudder durability which is desired by Japanese and Korean automakers.
- Mercedes MB 236.41
- Aisin Warner AW-1
- FCA US LLC ATF+3® , ATF+4®†
- Ford MERCON®, MERCON® V, MERCON® SP and MERCON® LV‡
- General Motors DEXRON-II and DEXRON-III
- Honda/Acura DW-1 and Z-1
- Hyundai/Kia Genuine ATF and SP-II, SP-III, SP-IV/ SPH-IV and NWS-9638 T-5
- Isuzu SCS, Genuine ATF
- Mazda ATF M-III and ATF M-V
- Mitsubishi ATF-J2, ATF-J3, SP-II, SP-III, SP-IV
- Nissan/Infiniti Matic D, Matic K, Matic J and Matic S
- Subaru ATF, ATF-HP, ATF 5AT
- Toyota/Lexus Type T-III, Type T-IV, Type WS
- Volkswagen/Audi Part #G 055 540 (A2)
- Volvo Part No. 1161521, 1161540/1161640
- Hybrid vehicles with electronic continuously variable transmissions (eCVTs) where the OEM specifies a MERCON LV or a Toyota Type WS fluid.

This product is not suitable for belt- or chain-driven continuously variable transmission (CVT) applications

Description: A high performance, low viscosity, anti-shudder type multipurpose automatic transmission fluid (ATF) formulated with hydrocracked base oils which provide outstanding oxidation resistance.

Application: All General Motors automatic transmissions, including 2006 and later models that require DEXRON®-VI fluids. Also suitable for many Asian and North American automatic transmissions that require low-viscosity and/or anti-shudder type fluids.

Also suitable for use in BTR M85LE and BTR M95LE four speed automatic transmissions fitted to Ford vehicles.

Pack sizes: 18 litre.



Delo[®] Syn ATF HD

510404

SAE Grade: 10W

Performance Standards: Allison Transmission: C-4; Allison Transmission: TES-389; Voith Turbo: H55.6335 (G607 List); Voith Turbo: H55.6336 (Extended Drain approved); MAN: 339 Type V1, V2 and Z2; Mercedes Benz Sheet 236.9; Volvo: 97341; ZF (approved Reference 001219): ZF TE-ML 03D; ZF TE-ML 04D; ZF TE-ML 14B; ZF TE-ML 16L; ZF TE-ML 17C.

Suitable for use where the following fluid specifications are recommended: Allison: TES-295; Ford MERCON[®] (obsolete); GM DEXRON[®]-III (obsolete).

Description: A premium performance, multipurpose, anti-wear automatic transmission fluid formulated in ultra high viscosity index base fluid, with Allison Transmission, Mercedes Benz and Voith Turbo approvals. Specially designed for heavy duty automatic truck and bus transmissions operating in severe service.

Application: Recommended for the automatic transmission systems of passenger cars, trucks, off-highway construction, mining and agricultural equipment, and other applications where the former Dexron-III or and Allison Transmission fluids are specified.

Particularly suitable for use in Allison automatic transmissions in severe applications, such as rubbish trucks, where synthetic fluids meeting Allison specification TES-295 are recommended. Also suitable for use in certain manual transmissions, power steering, rotary vane and screw type air compressors and hydraulic systems except where specialist fluids are required.

Pack sizes: 208 litre, 18.9 litre.



MANUAL & POWERSHIFT

Delo Syn-Trans XV

510405

SAE Grades:	75W-80
Performance Standards:	API GL-4; Volvo 97318 (Approval # 11)
Approvals Planned:	Volvo 97305; Volvo 97307; Eaton (500,000 kms/3yrs); MAN 341 Type E4. Suitable for use: MAN 341 Type Z4; Mercedes Benz MB 235.4, 235.11; ZF TE-ML 02L, 02E*; DAF: (Eaton Gearboxes) – Meets requirements *Note that ZF mandates the use of a product with a formal ZF TE-ML 02E approval during the warranty period. Delo Syn-Trans XV may be used in these applications (400,000 kms/3 years) after the end of the warranty period
Description:	A premium synthetic, manual transmission fluid formulated specifically for Volvo iShift and Mack mDrive automated manual transmissions. Engineered to provide excellent fluid shear stability and superb frictional characteristics to promote smooth, easy shifting.
Application:	Recommended for heavy duty synchronised manual and automated manual transmissions when operating on extended service under severe conditions. Suitable for use in a wide range of transmissions constructed by the truck constructors themselves and by ZF, including AS Tronic models and models fitted with intarders.
Pack sizes:	200 litre and 20 litre

Easy Shift

510283

SAE Grade:	75W-90
Performance Standards:	Meets API: GL-4 (self-certified)
Description:	A high performance, highly shear stable, multigrade manual transmission fluid specifically designed for Asian passenger car manual transmissions and transaxles and also other manual transmissions fitted to modern passenger car and light commercial vehicles.
Application:	Recommended for Japanese and Korean passenger car and light commercial transmissions and transaxles and suitable for use in the following makes: <ul style="list-style-type: none">• Hyundai• Kia• Mazda• Mitsubishi• Nissan• Suzuki• Toyota Not recommended for use in heavy-duty truck and bus manual transmissions, or in spiral bevel or hypoid drive axles where API GL-4 or GL-5 type gear lubricants are specified.
Pack sizes:	60 litre, 20 litre and 500 ml (500 ml pack being discontinued).



Delo® Syn-Trans XE **(NEW VISCOSITY GRADE)** **510420**
Replaced SAE 50

SAE Grade: 75W-90

Performance Standards: API: MT-1; Eaton: PS-164 Revision 7; Meritor Specification: O-81; ZF: Freedomline AMTS; Mack: TO-A Plus; International: TMS-6816 (suitable for use); Spicer: MS-961-Y (suitable for use).

Description: A premium performance, synthetic-based, non-EP, heavy duty manual transmission oil with excellent thermal and oxidation resistance.

Application: Recommended for the lubrication of North American type, heavy duty non-synchronized transmissions, such as those manufactured by Eaton and Mack. Also recommended for ZF Freedomline automated manual transmissions. It is especially suitable where operating conditions are severe or where equipment must operate in extremely hot or cold climates.

Pack sizes: 189 litre, 17 litre.

Delo TorqForce *(Replaces Torque Fluid 414, 434, 454)* **SAE 10W - 510157**
SAE 30 - 510158
SAE 50 - 510159

SAE Grades: 10W, 30, 50.

Performance Standards: Caterpillar: TO-4; Komatsu: KES 07.868.1 (SAE 10W); Volvo: 97305-90 (SAE 50); Eaton Fuller/Roadranger (SAE 30 & 50); Meritor (Rockwell) transmissions (SAE 50); ZF: TE-ML 03C (SAE 10W & 30); TE-ML 07F (SAE 30).

Description: A high performance, non friction modified, heavy duty transmission fluid series primarily for powershift transmissions and final drives requiring Caterpillar TO-4 fluids.

Application: Recommended for the following applications:

- Caterpillar and Komatsu powershift transmissions final drives and marine transmissions.
- Caterpillar mobile equipment hydraulic and hydrostatic systems – TorqForce SAE 10W fully meets Caterpillar hydraulic fluid requirements.
- Mobile hydraulic systems, hydrostatic transmissions, heavy-duty manual transmissions and final drives for which heavy-duty engine oils are required.
- Viscosity grade will depend on ambient temperature conditions and operating severity.

Pack sizes: 200 litre, 18 litre.

Translube LD **SAE 80W – 510317**
SAE 90 – 510318

SAE Grades: 80W, 90.

Performance Standards: Mercedes-Benz: Sheet 235.5; MAN: 341 Type E2, MAN 341 Type Z2; ZF: TE-ML 02B, 16A (SAE 90 approved), 17A, 19A (SAE 90 approved); API: GL-4 (self-certified).

Description: A premium performance, mild EP, automotive gear lubricant specifically designed to meet Mercedes-Benz Sheet 235.5 requirements for service in heavy-duty vehicle manual transmissions.

Application: Recommended for manual transmissions and other components of Mercedes-Benz, MAN and other European heavy-duty vehicles, for both normal and long drain service.
 Also suitable for other light and heavy-duty manual transmissions, transaxles, planetary hubs and spur gear axles which specifically require mild-EP gear oils meeting API GL-4.

Pack sizes: Translube LD SAE 80W: 210 litre, 20 litre; Translube LD SAE 90: 20 litre.



TRACTOR

1000 THF

(Replaced Textran TDH Premium)

510082

Performance Standards: John Deere: J20C; Massey Ferguson: MF1135, M1141, M1143, M1145; Volvo WB101; ZF TE-ML 03E, 05E, 05F, 17E, 21F (ZF approval number ZF000100); Case Corporation JIC-143, JIC-145, MS 1206, MS 1207, MS 1209, MS 1210 (TCH); Case New Holland MAT 3525, MAT 3505; AGGO – improved power fluid 821XL; Ford ESEN-M2C86-B; Ford New Holland ESN-M2C123-D, FNHA 2 C 201; Caterpillar TP-2; International Harvester B6; Kubota UDT; Minneapolis-Moline Q-1766, Q-1722, Q-1766B; Oliver Q-1705; Renk Doromat 874A and 874B; White Farm Equipment Q-1826.

Description: 1000 THF is a high quality, multifunctional tractor hydraulic fluid, specially formulated for use in transmissions, final drives, wet brakes and hydraulic systems of tractors and other equipment employing a common fluid reservoir.

Application: For use where tractor manufacturers specify the use of a THF or UTTO type product which includes mixed fleets of agricultural tractors and associated off-road equipment. Particularly suitable for use in enclosed oil immersed (wet) brakes and power take off (PTO) clutches as the special additives used prevent chatter and squawk.
Also suitable for mobile hydraulic systems and many automotive manual transmissions and gearboxes.

Pack sizes: 200 litre, 18 litre.



Super Tractor

500421

SAE Grade: 15W-40

Performance Standards: API: CF, CF-4/SF, API GL-4; ZF: TE-ML 06B, TE-ML 07B.
Suitable for use where the following are specified: Ford: ESN-M2C159-B2, -B3; Ford New Holland FNH 820092102, 890092103; New Holland NH 024C; Massey Ferguson: CMS M1144.

Description: A shear stable, multi-viscosity super tractor oil universal (STOU) fluid, designed for use in tractor engine crankcases, transmissions (including wet brakes), final drives and hydraulic systems.

Application: A multi-functional oil suitable for:

- Where the tractor manufacturer specifies the use of an STOU type product.
- Mixed fleets of agricultural tractors and associated equipment.
- Mobile or stationary diesel engines.
- Older style petrol engines.
- Automotive manual transmissions and gearboxes.
- Mobile hydraulic systems.
- Enclosed oil immersed (wet) brakes.
- Power take off (PTO) clutches.

Pack sizes: 200 litre, 18 litre.





Typical Characteristics

Product	Code	SAE Grade	Density @ 15°C kg/L	Flash Point °C	Pour Point °C	Viscosity cSt @		Viscosity Index	TBN mgKOH/g	Sulphated Ash %m
						40°C	100°C			
1000 THF	510082	-	0.890	230	-39	57.5	9.5	148	-	-
Delo Syn ATF HD	510404	10W	-	216	-45	35.3	7.4	183	-	-
Delo Syn-Trans XV	510405	75W-80	0.864	244	-54	54.1	9.2	151	-	-
Delo Syn-Trans XE	510420	75W-90	0.860	221	-45	132	17.5	146	-	-
Delo TorqForce SAE 10W	510157	10W	0.877	220	-239	43.3	6.8	114	-	-
Delo TorqForce SAE 30	510158	30	0.894	254	-30	92.6	10.9	102	-	-
Delo TorqForce SAE 50	510159	50 (90)*	0.905	270	-18	224	19.1	96	-	-
Easy Shift	510283	75W-90	0.876	190	-40 (max)	95.9	16.4	186	-	-
Havoline ATF-J	510094	10W	0.859	-	-51	36.9	7.3	165	-	-
Havoline Synthetic Multi-Vehicle ATF	510126	10W	-	-	-54	30.1	5.95	147	-	-
Super Tractor	500421	15W-40 (75W-90)*	0.889	232	-33	113	15.1	139	10.1	1.4
Texamatic 1888	510134	10W	0.855	190 (min)	-51	35.8	7.2	168	-	-
Translube LD SAE 80W	510317	80W	0.879	224 (min)	-30	85.4	10.5	106	-	-
Translube LD SAE 90	510318	90	0.887	228 (min)	-30	150	15.0	100	-	-



Automotive Gear Lubricants are blended from high quality base stocks and incorporate specialised additives which improve oxidation resistance, impart strong corrosion prevention properties, minimise foaming and, where required, impart increased lubricity and extreme pressure characteristics.

Delo® Gear ESI

SAE 80W-90 - 510226
SAE 85W-140 - 510227

SAE Grade:	80W-90, 85W-140
Performance Standards:	API: GL-5; API: MT-1; SAE J2360 (former MIL-PRF-2105E); Meritor: O-76Q, O-76R Extended Drain; Mack: GO-J and GO-J Plus Extended drain (SAE 80W-90).
Description:	A premium performance, multipurpose automotive EP gear lubricant, 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.
Application:	<ul style="list-style-type: none"> • Automotive differentials operating in severe service conditions. • 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 and off-road heavy-duty equipment. • Industrial gear sets and bearings where EP type gear lubricants of this viscosity are recommended.
Pack sizes:	200 litre, 17 litre.

GearTex LSD

(previously called Gear Oil LSD)

510212

SAE Grades:	90.
Performance Standards:	API: GL-5; Borg Warner 5M-31 (obsolete)
Description:	A high performance, EP automotive gear oil specifically designed for “limited slip” rear drive differentials, particularly those of the Borg Warner “cone clutch” design.
Application:	<ul style="list-style-type: none"> • Older Borg Warner limited slip differentials, including those with hypoid gears, as fitted to cars, and light trucks. • Other limited-slip differentials where oils meeting Borg Warner 5M-31 are specified
Pack sizes:	205 litre, 20 litre.

Hypoid LD

510321

SAE Grades:	85W-90.
Performance Standards:	API: GL-5; Mercedes-Benz: Sheet 235.6; MAN: 342 Type M2 (long drain); ZF: TE-ML 16C/17B/19B/21A approvals.
Description:	A premium performance, multipurpose EP, automotive gear lubricant specifically designed to meet Mercedes-Benz Sheet 235.6 requirements for “long drain” service in heavy-duty vehicle axles.
Application:	Recommended for rear axles and components of Mercedes-Benz, MAN and other European heavy-duty vehicles both normal and long drain service. Also suitable for other automotive hypoid and spiral bevel axles for which API GL-5 oils are specified.
Pack sizes:	210 litre, 20 litre.



Multigear S

(NEW PRODUCT)

510326

SAE Grade:	75W-140.
Performance Standards:	API: GL-5, MT-1; Scania: STO 2:0 A, 1.0; Mack: GO-J; SAE: J2360; Meritor 076-M; Ford WSL-M2C192A; US Military MIL-PRF-2105E; ZF: TE-ML 05B, 12N, 16F, 19C, 21B, 07A and 12B.
Description:	A premium performance, synthetic, automotive gear lubricant.
Application:	It is approved to Scania STO 2:0A for use in Scania axles both during and after warranty providing extended drain capabilities and fuel economy benefits. Also suitable for use in Scania transmissions operating in New Zealand ambient conditions. Provides outstanding thermal and oxidative stability and reduces deposit formation under severe operating conditions. Recommended for use in applications that require Ford specification WSL-M2C192-A, such as differentials of Jaguar cars and Ford Transit vans.
Pack sizes:	208 litre and 20 litre

Delo® Syn-Gear XDM

SAE 75W-90 - 510402
SAE 80W-140 - 510403

SAE Grades:	75W-90, 80W-140.
Performance Standards:	API: GL-5, MT-1; Dana (Roadranger®): SHAES 256 Rev C Extended Drain (SAE 75W-90 grade approved); Dana (Roadranger®): SHAES 429 Extended Drain (SAE 75W-90 grade approved); Meritor: 0-76N Extended Drain (SAE 75W-90 grade approved); Scania: STO 1:0; Mack: GO-J Plus (SAE 75W-90 grade approved); SAE: J2360 (approved).
Description:	A premium performance, synthetic based, extreme pressure gear lubricant meeting API GL-5 and MT-1 designed to provide excellent year-round performance and protection in automotive gear applications.
Application:	Provides outstanding thermal and oxidative stability and reduces deposit formation under severe operating conditions. Recommended for the lubrication of both on-road trucks and off-road construction, mining and agricultural equipment axle & differential applications where operating conditions are severe, or where equipment must operate in extremely hot or cold climates. Suitable for extended drain applications and in industrial gear applications where automotive EP gear lubricants are recommended.
Pack sizes:	SAE 75W-90: 15.9 kg (approx. 18.5 ltrs). SAE 80W-140: 181 kg (approx. 207 ltrs), 15.9 kg (approx. 18 ltrs)

Delo® Gear EP-5

(replaces Thuban® GL5 EP)

SAE 80W-90 – 510411
SAE 85W-140 - 510412

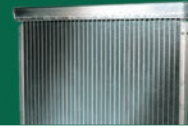
SAE Grades:	80W-90, 85W-140
Performance Standards:	API: GL-5, MT-1; Mack: GO-J.
Description:	A high performance, multipurpose thermally stable, automotive gear lubricant formulated with “clean gear” technology for applications where API GL-5/MT1 performance is required.
Application:	Recommended for automotive hypoid gear differentials operating under high speed and/or low speed, high torque conditions. Also suitable for heavy-duty, non-synchronized manual transmissions and transaxles requiring this type of lubricant as well as automotive steering gears. Note: For manual transmissions and transaxles where the manufacturer recommends API GL-4 lubricants and advises against the use of API GL-5 lubricants, then Caltex Easy Shift SAE 75W-90, Translube LD, or Delo Syn-trans XV SAE 75W-80 may be suitable options to consider, depending on the manufacturers viscosity requirements.
Pack sizes:	200 litre, 60 litre, 18 litre. SAE 80W-90 also available in 4 litre and 1 litre packs.



Typical Characteristics

Product	Code	SAE Grade	Density @ 15°C kg/L	Flash Point °C	Pour Point °C	Viscosity cSt @		Viscosity Index
						40°C	100°C	
Delo Gear EP-5 80W-90	510411	80W-90	0.903	230	-30	140	15.0	108
Delo Gear EP-5 85W-140	510412	85W-140	0.909	226	-15	344	25.5	97
Delo Gear ESI SAE 80W-90	510226	80W-90	0.894	215	-33	140	14.2	99
Delo Gear ESI SAE 85W-140	510227	85W-140	0.901	-	-15	341	25.0	95
Delo Syn-Gear XDM 75W-90	510402	75W-90	0.870	180	-54	106	14.9	146
Delo Syn-Gear XDM 80W-140	510403	80W-140	0.880	192	-39	275	27.2	130
GearTex LSD 90	510212	90	0.904	230	-18	203	18.3	99
Hypoid LD SAE 90	510321	85W-90	0.900	215	-27	190	17.5	99
Multigear S	510326	75W-140	0.867	185	-46	185	26	169

ENGINE ANTI-FREEZE/COOLANTS



Delo XLC Anti-freeze/Coolant Concentrate

510614

(previously called Caltex Extended Life Coolant)

- Performance Standards:** ASTM D3306, ASTM D6210; DAF 74002; Detroit Diesel 93K217; Mercedes-Benz 325.3 under DBL 7700.30; MAN 324 SNF; MTU MTL 5048; TMC RP 364; Ford WSS-M97B44-D; GM 6277 (DEX-COOL); MB 3245.3; VW TL 774F
- Description:** Delo XLC is a non-nitrited extended life Anti-freeze/Coolant formulation for heavy duty and light duty diesel vehicles and equipment and is formulated with an aliphatic corrosion inhibitor system inhibitor. (Orange in colour)
- Recommended for use in:** Deutz Stationary Diesel Engines; GE-Jenbacher Stationary Natural Gas Engines; Detroit Diesel Engines; Hino Truck Diesel Engines; Isuzu Truck Diesel Engines; Kobelco and Komatsu Construction Equipment Diesel Engines; MTU 2000/4000 Diesel Engines; Navistar MAXXFORCE Engines; Scania Truck Diesel Engines; Volvo Construction Equipment (VCE) Diesel Engines; Wartsila Stationary Diesel Engines; European HD OEMs that require Phosphate-free and Nitrate-free formulations; Japanese HD OEMs that require Silicate-free formulations.
- Applications:** Delo XLC is recommended for:
- Heavy duty engines regardless of fuel type or environmental controls being used where the OEM recommends a nitrite free, silicate free coolant.
 - Mixed fleets where automobiles, light duty trucks and heavy duty trucks are being serviced and the OEM recommends a nitrite free, silicate free coolant.
 - Recreational vehicles where a nitrite free, silicate free product is recommended.
 - On-road, Off-road and Marine cooling system applications.
- Optimal Service Life:** 960,000 kilometers/12,000 hours/6 years with no extender needed. Passenger Car and light Commercial Vehicles – 250,000 kms/5 years of cooling system protection. Does not require the addition of Supplemental Coolant Additives (SCA's).
- Pack sizes:** 200 litre, 18 litre, 1 litre.



Delo XLC Anti-freeze/Coolant Pre-mixed 50/50

510609

- Description:** This is identical to the Delo XLC Antifreeze/Coolant above but is already pre-mixed 50/50 with deionised water and so should be used directly from the container into the cooling system without the addition of any further water.
- Application:** The same performance standards, applications and service periods as for Delo XLC above, apply to this product.
- Pack sizes:** 200 litre, 18 litre.



Delo® ELC Anti-freeze/Coolant Concentrate

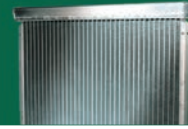
510626

(previously called Delo Extended Life Coolant)

- Description:** Delo® ELC Antifreeze/Coolant is a single phase, ethylene glycol based, and is based on patented aliphatic carboxylate corrosion inhibitor technology specifically formulated for heavy duty cooling system applications that require nitrite. (Red in colour)
- Performance Standards:** ASTM D6210, D3306; Caterpillar EC-1; Navistar B1 Type 3; TMC RP 329, 302A, 351.



ENGINE ANTI-FREEZE/COOLANTS



Recommended for use in: Caterpillar Stationary Natural Gas Engines; Cummins QSK, QST, ISX 15, ISX, ISM, ISL and ISB Diesel Engines; Cummins Westport ISX 12G and ISL G CNG engines; Deutz Stationary Diesel Engines; Freightliner and Western Star Truck Diesel Engines; GE-Jenbacher Stationary Natural Gas Engines; Hino Truck Diesel Engines; Isuzu Truck Diesel Engines; Kenworth and Peterbilt Truck Diesel Engines; Kobelco and Komatsu Construction Equipment Diesel Engines; Navistar Truck Diesel Engines; Scania and MAN Truck Diesel Engines; Volvo and Mack Truck Diesel Engines; Wartsila Stationary Natural Gas Engines.

Applications: Delo[®] ELC is recommended for:

- Heavy duty engines regardless of fuel type or environmental controls being used where the OEM recommends a silicate free, extended life coolant that contains nitrites.
- Mixed fleets where both light duty and heavy duty trucks are present.
- Stationary engine applications regardless of fuel type being used.
- Marine cooling systems requiring freeze protection and a nitrite containing coolant.

Recommended maximum service intervals without the addition of an extender are:
On-road use - 1,250,000 kilometers
Off-road use - 15,000 hours or 8 years
Does not require the addition of Supplemental Coolant Additives (SCA's).

Pack sizes: 200 litre, 18 litre.

Delo[®] ELC Anti-freeze/Coolant Pre-mixed 50/50 510629

Description: This is identical to the Delo[®] ELC above but is already pre-mixed 50/50 with deionised water and so should be used directly from the container into the cooling system without the addition of any further water.

Application: The same performance standards, applications and service periods as for Delo[®] ELC above, apply to this product.

Pack sizes: 200 litre, 18 litre.



Delo[®] XLI Corrosion Inhibitor Concentrate 510636

Description: Delo[®] XLI is a water based, low toxicity, environmentally friendly nitrite free carboxylate inhibitor. It provides corrosion protection for engine metals including aluminium, iron, copper and solder alloys and provides a very long service life with no regular inhibitor additions required.

Applications: Before use it should be diluted to 5.5%-10% with good quality water and is recommended for the following OEM use as a cooling water inhibitor:
Detroit Diesel; Deutz (TR0199-99-2091); GEC Alsthom Ruston; Liebherr MD 1-36-130 (DCA); MaK; MAN 248; MAN Diesel (2-stroke and 4-stroke); MB 312.0; MTU MTL 5049; MWM; Newman-Haas Racing; Scania TI 2-98 0813 TB; Sulzer Diesel ZBS0503.doc; Ulstein Bergen; Wartsila 32-9011; Yanmar.

Delo[®] XLI is recommended for use in any OEM equipment recommending a nitrite free, water based carboxylate based corrosion inhibitor.

Service Life: Delo[®] XLI Corrosion Inhibitor when mixed with clean water at the correct concentration can provide superior protection for a minimum of 960,000 kms, 12,000 hours or 6 years in stationary engines.

Pack size: 18 litre.





Brake and Clutch Fluid 260 DOT 4 (HD Brake Fluid)

511663

Performance Standards: U.S. Federal Motor Vehicle Safety Standard FMVSS No. 116 DOT 4 and DOT 3; SAE J 1704 and SAE J1703; ISO 4925 (Classes 3 & 4); JIS K2233-95 (Types 3 & 4); NATO Specification H-542 (OX-8).

Description: A premium, non-petroleum automotive brake fluid designed for use in conventional hydraulic brake and clutch systems, particularly in severe service conditions or where DOT 4 fluids are recommended. Provides an additional safety margin against "vapour lock".

Application: Recommended for use in the following application:

- All hydraulically operated motor vehicle braking systems (drum and disc types) for which a DOT 4 or SAE J1704 fluid is specified. This may include:
- Vehicles with anti-lock (ABS) braking systems.
- Hydraulic clutch systems requiring conventional fluids.
- Passenger cars, commercial road transport, off-highway vehicles, agricultural tractors and motorcycles.
- Make-up or service fill of braking systems requiring DOT 3 or SAE J1703 fluids.
- Make-up or service fill of braking systems requiring DOT 3 unless the OEM specifically recommends against the use of DOT 4 fluids (e.g. certain Toyota models).

Not to be used in systems designed for mineral oil based fluids (LHM), e.g., certain Citroen models, or where Silicone DOT 5 fluids are recommended.

Pack sizes: 5 litre, 500ml



Product Descriptor	
Key Properties	
FMVSS Grade	DOT 4
Equilibrium Reflux Boiling Pt, °C	275
pH	7.5
Viscosity, - mm ² /s @ - 40°C - Mm ² /s @ 100°C	1347 2.2
Wet Equilibrium Reflux Boiling Pt, °C	183



Industrial oils must provide a complete range of lubricating properties, from economical oils for standard machinery to premium products for the most exacting lubrication of precision equipment. Caltex markets a comprehensive range of industrial oils which reduce friction, minimise wear and corrosion, and carry the loads needed to keep machinery operating at peak efficiency.

TURBINE OILS

Regal® R&O

ISO 46 - 520011
ISO 68 - 520012

ISO Grades: 46 & 68

Description: An inhibited turbine oil formulated from highly refined base stocks and rust, oxidation and foam inhibitors. They have excellent water separability and air release properties and their oxidation stability resists oil breakdown during exposure to high temperature conditions, ensuring a long service life.

Application: Suitable for the following applications provided a rust and oxidation inhibited oil is acceptable:

- Steam & 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 gear sets requiring enhanced load carrying capacity.
- Centrifugal, rotary and reciprocating air compressors, turbo-bowers and centrifugal pumps, requiring a rust and oxidation inhibited oil (not recommended for use in breathing air compressors)
- 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 68 is suitable for use in Masport rotary vacuum pump's (RVP's) used in dairy farm milking machine applications. In extreme cold weather conditions, Regal R&O 46 may be a more suitable alternative.

Suitable for use where the following industry and OEM specifications are requested:

British Standard: BS 489:1999; German Standard: DIN 51515 Part 1; ASTM: D4304-06a Type I; ANSI/AGMA: 9005-E02 for R&O inhibited oils; Cincinnati Machine P-55 (ISO 46) and P-54 (ISO 68); Siemens: TLV 9013 04; Siemens: MAT 812102 (ISO 46); Solar: ES 9-224W Class II; General Electric: GEK 27070, GEK 28143B, GEK 46506D.
Approved against David Brown Table M - 1M (ISO 46) & 2M (ISO 68).
NOT recommended as an industrial heat transfer oil.

Pack sizes: 200 litre, 18 litre.

HYDRAULIC OILS

Rando® HD

520210, 520211, 520212, 520213

ISO Grades: 32, 46, 68, 100

Description: Rando® HD oils are formulated with premium Group II base oils and anti-wear hydraulic additives, and are designed to give robust protection to hydraulic pumps in mobile and stationary systems. The use of Group II base stocks provides higher oxidation test life than solvent extracted hydraulic oil products. Good hydrolytic stability and water separation characteristics promote excellent filterability in the presence of water contamination and they have good anti-foam and air release properties.





- Application:**
- For use in the following applications:
- Industrial hydraulic systems.
 - Hydraulics of mobile and construction equipment (where a water separating product is required).
 - Hydraulic systems with vane, gear or piston pumps.
 - Plastic injection molding machines.
 - Machine tools.
 - Enclosed gear systems (dependant on load) and industrial circulating systems

- Performance Standards: Approved against:**
- Parker Hannifin (Denison Hydraulics) HF-0 (ISO 32, 46, 68)
 - Eaton Vickers I-286-S [industrial applications], M 2950-S [mobile applications] (ISO 32, 46, 68).
 - David Brown Industrial Gears 0A (ISO 32), 1A (ISO 46), 2A (ISO 68), 3A (ISO 100). Suitable for use where oils meeting Cincinnati Machine P-68 (ISO 32), P-69 (ISO 46) and P-70 (ISO 68) are required.
- Rando HD oils also meet the requirements of various industry standards:
- Bosch Rexroth RE 07 075; ISO 6743:1999 Part 4, HM fluid; ISO 11158:2009, HM; DIN 51502:1990, HLP fluid; DIN 51524:2006-04 Part 2, HLP

Pack Sizes: 200 litre, 18 litre (except Rando HD 100 which is 200 litre only)

Rando® HDZ 520251, 520253, 520254, 520255

ISO Grades: 15, 32, 46, 68

Description: Rando® HDZ is a premium quality, shear stable, multi-viscosity, anti-wear hydraulic fluid designed to give robust protection for hydraulic systems subjected to wide variations in ambient and operating temperatures. Good hydrolytic stability and water separation characteristics help prevent deposit formation and rust in the presence of water contamination and their effective rust and corrosion inhibitors and good anti-foam and air release properties ensure smooth operation and system efficiency.

- Application:**
- For use in the following applications:
- Industrial hydraulic equipment subject to wide variations in temperatures.
 - Hydraulics of mobile, construction and agricultural equipment (where a water separating product is required)
 - Hydraulic systems with vane, gear or piston pumps.
 - Fork-lift trucks (in refrigerated areas).
 - Plastic injection molding machines.
 - Marine deck equipment, steering gears, bow thrusters and automatic controls.
 - Machine tools and enclosed gear systems (dependent on load)

Performance Standards: Approved against:
Parker Hannifin (Denison) HF-0 (ISO 32, 46, 68); Eaton-Vickers 35VQ25A, I-286-S (industrial applications), M-2950-S (mobile applications) (ISO 32, 46, 68); MAG Cincinnati, Cincinnati Machine P 68 (ISO 32), P 69 (ISO 68), P 70 (ISO 46).

Meets the requirements of: Bosch Rexroth RE 07 075 (10.05), RE 90 220 (05.10) (ISO 32, 46, 68); Auburg (ISO 46 – standard wear measurements); JCMAS HK-1 (ISO 32, 46); ASTM D6158, HV (ISO 32, 46, 68); ISO 6743 (1999) Part 4, Type HV (ISO 15, 32, 46, 68); ISO 11158 (2009), HV (ISO 15,32, 46, 68); DIN 51502 (1990), Type HVLP (ISO 15,32, 46, 68); DIN 51524 (2006-04) Part 3, HVLP (ISO 15,32, 46, 68).

Pack sizes:
Rando HDZ 15 – 18 litre only
Rando HDZ 32 and 46 – 200 and 18 litre
Rando HDZ 68 – 200 litre only.





Clarity Hydraulic Oil AW

520267

ISO Grades:	46
Description:	<p>Clarity® Hydraulic Oil AW 46 is formulated with premium base oil technology and an ashless (“zinc-free”) additive system that provides exceptional oxidation stability, water separability, foam suppression and protection against wear, rust and corrosion.</p> <p>It is designed to meet or exceed the performance requirements of conventional antiwear hydraulic oils, especially in severe, high-output applications such as axial piston pumps where pressures may exceed 5000 psi.</p>
Application:	<p>For use in the following applications:</p> <ul style="list-style-type: none"> • Mobile and stationary hydraulic vane-, piston-, and gear-type pumps
Environmental Sensitivity:	<p>Provides a cost-effective alternative to readily biodegradable hydraulic fluids such as those that are ester-based and vegetable oil-based. It passes the Aquatic toxicity (EL/LL50 OECD 201, 202,203) – tested with fingerling rainbow trout, daphnia, freshwater algae, and Mysid shrimp using a water accommodated fraction up to 5000 mg/litre (50 times the minimum pass rate of the LL50 test)</p>
Performance Standards:	<p>Meets the requirements of:</p> <ul style="list-style-type: none"> • Denison HF-0, HF-2 (Testing requirements of T5D) • Cincinnati Machine P70 (MAG Cincinnati) • Eaton-Vickers for use in m-2950-S (mobile) and I-286-S (stationary) hydraulic systems. • Passes Eaton-Vickers 35VQ25 pump test • DIN 51502:1990, HLP fluid • DIN 51524 (2006-04) Part 2, HLP fluid • ASTM D6158 HM • ISO 6743:1999 Part 4, HM fluid • ISO 11158:2009, HM.
Pack size:	208 litres and 18.9 litres

COMPRESSOR OILS

Cetus® PAO

540537

ISO Grades:	68
Performance Standards:	<ul style="list-style-type: none"> • DIN 51506 Group VDL • ABB approval for VTR.4 turbochargers with rolling-contact bearings, per VTR.4-4-010, as a specially tested synthetic oil for heavily loaded turbochargers, up to 5,000 hour drains • Has been used successfully in the lubrication of many types of air compressors, including Atlas Copco units.
Description:	<p>A premium performance, synthetic compressor oil based on polyalphaolefin technology containing a rust and oxidation inhibitor system and anti-wear additives to provide outstanding oxidation resistance and corrosion protection under severe operating conditions.</p>
Applications:	<ul style="list-style-type: none"> • Flooded screw compressors • Reciprocating and Rotary air compressors • Medium-speed marine diesel engine turbochargers <p>NOT recommended for use in breathing air compressors</p>
Pack size:	20 litre.



Compressor Oil EP VDL 100

540588

- ISO Grade:** 100.
- Performance Standards:**
- Meets the test requirements of German Standard DIN 51506 Group VDL
 - Is recommended for:
 - Tanabe for use in their reciprocating-type compressors
 - Sperre for use in their Classic 30 bar reciprocating air compressors
 - Suitable for use in Teikoku air compressors
 - Used successfully in Hatlapa and Hamworthy air compressors.
- Description:** A high performance, petroleum based compressor oil specifically designed for severe operating conditions. It delivers stable high temperature oxidation resistance with reduced deposit formation on pistons and valves, excellent corrosion protection, foam inhibition and extreme pressure performance.
- Application:** Recommended for:
- Single-stage and multi-stage reciprocating and centrifugal compressors and oil flooded screw compressors operating at high temperatures up to 2200C
 - Air or inert gas reciprocating compressors
 - Stationary, semi-portable and portable units
- NOT recommended for use in breathing air compressors*
- Pack sizes:** 18 litre.

REFRIGERATION COMPRESSOR OILS

Capella® A

520435

- ISO Grade:** 68
- Performance Standards:** British Standard BS 2626:1992; DIN 51503; ABB Stal Refrigeration AB Approval: Broedrene Gram Approval: Sabroe Approval
- Description:** A premium synthetic compressor oil specifically designed for the lubrication of ammonia refrigeration compressors operating at high discharge temperatures in refrigeration systems with extremely low evaporator temperatures. Formulated from specially formulated synthetic Polyalphaolefin (PAO) base fluids.
- Application:**
- Ammonia refrigeration compressors with minimum evaporator temperatures of -60oC
 - Refrigeration and air-conditioning system compressors.
 - Reciprocating and screw ammonia compressors operating at discharge temperatures exceeding 100oC.
- NOT recommended for use in breathing air compressors*
- Pack sizes:** 20 litre.

Capella® WF

520404

- ISO Grade:** 68
- Performance Standards:** British Standard: BS 2626: 1992, Type A Lubricants; APV-Baker; Bitzer Kuhlmaschinenbau; Bock; Gram; Grasso; Linde; McQuay; Sabroe; ABB Stal Refrigeration AB; Sullair; Technofrigo Dell'Osto; York.
- Description:** A 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 Flocc point.



- Application:**
- Air conditioning systems
 - Refrigeration systems using chlorofluoro-carbons (CFCs)
 - Refrigeration systems using ammonia, hydrochlorofluorocarbons (HCFCs), carbon dioxide, sulphur dioxide or ethylene chloride.
 - For large ammonia refrigeration systems, Chevron Capella A 68 may provide superior performance.
- NOT for use in systems containing hydrofluorocarbon (HFC) refrigerants, including HFC 134a .*
NOT recommended for use in breathing air compressors.
- Pack sizes:** 208 litre, 18.9 litre.

INDUSTRIAL GEAR OILS

Meropa® 530400, 530409, 530401, 530402, 530403, 530404

- ISO Grades:** 68, 100, 150, 220, 320, 460.
- Performance Standards:** NSI/AGMA 9005-E02 EP; US Steel 224 (ISO 68 to 320); David Brown Table E approved; DIN 51517 Part 3 CLP.
- Description:** High performance, mild EP, industrial gear lubricants formulated with a sulphur-phosphorus additive system, which also provides rust and oxidation inhibition, a corrosion and oxidation inhibitor and a metal passivator. The high thermal stability EP system maintains clean gear and bearing surfaces, minimising deposits. Specifically designed primarily for industrial gear lubrication services where loads and shock loadings are high.
- Application:**
- Enclosed industrial gear drives
 - 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.
- Pack sizes:** 200 litre – Meropa® 68, 100, 150, 220, 320 and 460.
20 litre – Meropa® 150, 220, 320 and 460.

MARINE GEAR LUBRICANTS

Pinnacle® Marine Gear Oil 220 560584

- ISO Grade:** 220
- Performance Standards:** AGMA: 250.04 (5EP); US Steel 224; DIN: 51517/3; Alfa Laval; Lohman-Stolterfoht; Ortlinghaus; Rolls Royce Marine; Westfalia.
- Description:** A fully formulated, quality synthetic gear lubricant based on a mixture of polyalphaolefin (PAO) and diesters. It offers excellent oxidation stability at elevated temperatures, extending oil drain life and providing outstanding wear protection.
- Application:** Recommended for lubricating plain and roller bearings, and open and closed gears at high temperatures. It can be applied by bath, splash or circulation systems, and is specially targeted for the lubrication of purifier gears and reduction gears.
- Pack sizes:** 20 litre



OPEN GEAR AND WIRE ROPE OILS

(also refer to *Texclad 2* in *GREASE* section)

Talcor OGP-4

(replaced *Crater 2X*)

571374

NLGI Grade: 1

Description: An advanced open gear lubricant consisting of a solvent free blend of synthetic base fluids and hydro-treated mineral oils complexed with new micro ground lubricating solids and plastic-coupling chemical agents that form a thixotropic matrix. Can be dispensed without heating through conventional lubrication systems and the established soft, pliable film provides high compressive strengths and low shear rates, while rheology stabilizers prevent residual build-up.

Application: For the lubrication of open gears, rack & pinions, dipper sticks, circle rollers and rails and other mechanisms that are found in the mining, steel, cement, sugar and other heavy industries. Gears and pinions that operate at elevated temperatures up to 85oC. Suitable for open gears on log haulers in forestry applications.

Pack sizes: 18 kg.

Crater[®] Fluid M

530433

Description: A black, adhesive, residual oil based lubricant, compounded to provide improved water resistance, water displacement and rust protection, and diluted with a high flash point solvent to allow easier application.

Application: Can include: wire ropes (as the solvent allows the lubricant to creep into the wire rope strands), open gears (e.g., mining, quarrying, construction and dredging equipment), chains and sprockets, flexible couplings and sliding surfaces (e.g., drag lines and shovels). Suitable for application by brushing, swabbing, dipping, spraying, drip cup or spout type can.

NOTE: If the solvent is allowed to evaporate from the product it takes on the consistency of Crater 2X which was previously discontinued.

Pack sizes: 15.9 kg.

SLIDEWAY LUBRICANTS

Way Lubricant X

540473

ISO Grade: 68

Performance Standards: Cincinatti Machine Specification P-47 Heavy-Medium Way Oil, Cincinatti Machine Stick-Slip Procedure.

Description: High quality, machine tool slideway lubricants formulated with a highly refined mineral oil, with EP, friction modifier (to reduce friction and drag which can cause stick-slip and machine tool chatter), rust and corrosion inhibitors and tackiness additives. It also provides good water demulsibility properties for coolant separation.

Application: Recommended for lubricating machine tool slideways and guides:

- Horizontal slideways in light-to-moderate applications (ISO 68)
- Other applications requiring an adhesive, corrosion inhibited lubricant with EP properties.

Pack sizes: 20 litre



Typical Characteristics

Product	Code	ISO Grade	Density @ 15°C kg/L	Flash Point °C	Pour Point °C	Viscosity cSt @		Viscosity Index
						40°C	100°C	
Capella A 68	520435	68	0.835	260	-57	68.7	10.6	143
Capella WF 68	520404	68	0.902	198	-30	65	6.7	24
Cetus PAO 68	540537	68	0.850	240	-52	68	10.3	141
Clarity Hydraulic Oil AW 46	520267	46	0.870	224	-30	46	6.8	101
Compressor Oil EP VDL 100	540588	100	0.899	248	-12	100	11.0	97
Crater Fluid M	530433	-	-	105	4	-	395	-
Meropa 68	530400	68	0.882	200	-15	68	8.8	101
Meropa 100	530409	100	0.878	210	-15	100	11.4	100
Meropa 150	530401	150	0.883	215	-15	150	14.9	99
Meropa 220	530402	220	0.890	215	-15	220	19.2	98
Meropa 320	530403	320	0.892	215	-15	320	24.3	97
Meropa 460	530404	460	0.907	215	-15	439	29.8	96
Pinnacle Marine Gear Oil 220	560584	220	0.884	250	-40	200	21.2	126
Rando HD 32	520210	32	0.860	216	-33	32.4	5.4	110
Rando HD 46	520211	46	0.870	238	-33	46	6.8	110
Rando HD 68	520212	68	0.870	240	-30	68	8.9	110
Rando HD 100	520213	100	0.873	240	-21	100	10.8	97
Rando HDZ 15	520251	15	0.889	150	-60	15.7	3.9	144
Rando HDZ 32	520253	32	0.861	204	-49	33.0	6.4	150
Rando HDZ 46	520254	46	0.867	216	-47	46.7	8.3	153
Rando HDZ 68	520255	68	0.874	222	-42	69.7	11.1	154
Regal R&O 46	520011	46	0.874	224	-9	46	6.7	100
Regal R&O 68	520212	68	0.879	234	-9	68	8.6	98
Talcor OGP-4 #1	571374	-	-	-	-	1197	-	-
Way Lubricant X 68	540473	68	0.879	215	-21	68	9.8	110



The great majority of grease applications have a parallel where lubricating oils may be used and hence a grease must be able to provide equal performance in all respects. Such applications include:

- (a) where the equipment is so designed that there is no way to retain oil for the parts being lubricated, e.g. open gears, wheel bearings, chassis springs etc.
- (b) where the lubricant must act as a seal and
- (c) where lubrication is infrequent, e.g. electric motor bearings.

Caltex markets a wide range of greases, of differing hardnesses and base material which exhibit the necessary qualities of heat resistance, shear stability, oxidation resistance, storage stability, water resistance, corrosion prevention and oil viscosity to meet the requirements of the automotive, mining and industrial fields.

LITHIUM BASED

Multifak Moly® EP *(Discontinued - replaced by Delo Heavy Duty Moly 3%)* **510843**

Multifak® EP **NLGI 2 - 540812**
NLGI 0 - 540810

NLGI No.: 0 & 2.

Performance Standards: NLGI Service Category LB (EP2); Volvo Approval 97718 (EP2); MAN 283 Li-P2 (EP2)

Description: A multipurpose EP industrial and automotive wheel bearing and chassis grease containing highly refined mineral base oils, lithium thickener, EP additives, and rust and oxidation inhibitors.

Applications: Multifak EP 2 can include: Industrial plain and rolling element bearings; general plant lubrication; construction equipment bearings; earthmoving, quarrying and mining; agricultural equipment; automotive wheel bearings; chassis grease point lubrication. Usable temperature range in continuous service for NLGI 2 is from -30°C to 130°C.

Multifak EP 0 is suitable for centralised lubrication systems on commercial vehicles and off-road equipment. Also suitable for industrial gearboxes where an NLGI 0 grease is required.

Pack sizes: NLGI 2 - 180kg & 16 kg; NLGI 0 - 16 kg only (Light brown in colour)

EPC 00 Grease **549334**

NLGI No.: 00

Description: A semi-fluid, multipurpose, extreme pressure, industrial and automotive grease made from lithium soap, sulphur phosphorus EP additives, high quality base oils and rust and corrosion inhibitors.

Applications: Its primary application is in centralised lubrication systems on commercial vehicles where an NLGI Grade 00 grease is required. It is also used in track rollers on some earthmoving equipment. EPC Grease 00 is generally recommended for continuous service between from -30°C to 70°C.

Pack sizes: 20 kg pail (Light brown in colour)



Ultra Duty® Grease

540952

NLGI No: 2

Description: Specialty Industrial Grease and also an automotive chassis and bushing grease. A premium, heavy-duty EP grease containing a high viscosity mineral oil, lithium thickener, effective EP additive, rust and oxidation inhibitors and tackiness agent. It has stay-in-place properties that make it particularly suitable for industrial equipment or automotive equipment operating in wet, muddy or dusty conditions.

Application: Its outstanding film strength and effective EP additive protect against component wear under severe conditions and shock loading.

Applications can include: Pulp & paper machinery; mining; logging and forestry; construction equipment; quarrying; material handling equipment; marine deck equipment; dredging equipment; heavy-duty transport; off-highway construction; agricultural tractors; general industrial greasing and chassis lubrication (including fifth wheel).

For wheel bearing lubrication of on-highway vehicles, other products that are specifically designed for this application, such as Caltex Delo Grease EP2 or Starplex 2, are generally preferred.

Usable temperature range in continuous service for NLGI 2 is from -10°C to 140°C with maximum short term exposure temperature of 165°C.

Pack sizes: 180kg, 50kg, 16kg, 425g cartridges. (Red in colour)

LITHIUM COMPLEX BASED

Delo® Grease ESI

540827



NLGI No: 2

Performance Standards: NLGI Service Category: LB

Description: A technically advanced, extended service premium grease for a wide variety of on-highway and light duty offroad applications. It is formulated with highly refined base stocks, a lithium complex thickener, rust and oxidation inhibitors, and extreme pressure and tackiness additives. Provides very good resistance to water wash-out and high level of anti-wear protects against component damage by wear and shock loading.

Applications:

- On-highway heavy duty truck wheel bearings and chassis lubrication including steering drag links, kingpins, transmission cross shaft pins, shackle pins and brake cam shafts.
- Fifth-wheel lubrication.
- General automotive wheel bearing and chassis lubrication.
- Construction and earthmoving equipment and agricultural tractor including pin and bush lubrication.
- General automotive wheel bearing and chassis lubrication.

Operating temperature range: -18°C to 177°C (short term exposure with frequent relubrication)

Pack sizes: 181kg, 54.5 kg, 15.9kg, 425g cartridges. (Red in colour)



Delo Heavy Duty EP Moly® 3% EP

(NEW PRODUCT)

540730

replaces Multifak Moly

NLGI No.: 2.

Performance Standards: Mack MG-C, Caterpillar 3% molybdenum disulphide requirements

Description: An extreme pressure grease designed for plain and anti-friction bearing applications operating under high stress/high load conditions, coupled with high ambient temperatures typically found in heavy-duty off-road applications. It contains a highly refined mineral base oil with a viscosity of 383 cSt @ 40°C, a lithium complex soap thickener and 3% molybdenum disulphide. It provides excellent corrosion and wear protection, water resistance in both submerged and direct pressure spray applications and shock load protection.

Application: Off-Road Construction such as dozers, excavators, backhoes, shovels, articulated loaders haul trucks etc. Surface & Underground Mining and Quarry machinery; Agricultural machinery and Heavy Duty On/Off Highway Road Construction and Maintenance Vehicles.

Pack sizes: 181kg, 50 kg, 16 kg, 400g cartridge (Grey/black in colour)

Delo Starplex® EP 2

510859

NLGI No.: 2.

Performance Standards: NLGI Service Category: GC-LB.

Description: A premium, multipurpose EP automotive wheel bearing and chassis grease containing an ISO 220 mineral base oil, a lithium complex thickener, EP additives, rust and oxidation inhibitors and tackiness additives.

Applications:

Automotive:

- Automotive wheel bearings and chassis lubrication in on and off-highway applications.
- Heavy-duty transport.
- Construction equipment and agricultural tractors

Industrial:

- General industrial greasing
- Usable temperature range in continuous service from -25°C to 130°C with maximum short term exposure to 220°C.

Pack sizes: 180kg, 50kg, 16kg, 425g cartridges. (Dark red in colour)





CALCIUM BASED

Texclad® 2

530436

NLGI No: 2.

Description: A proven performance, adhesive open gear grease based on a water-stabilised calcium thickener and high viscosity mineral oils, fortified with graphite and molybdenum disulphide. Smooth and buttery texture and has excellent resistance to water wash out which minimises loss of lubricant in service.

Applications:

- Exposed gears in construction, mining and industrial equipment. Dipper sticks on excavating shovels.
- Automotive fifth wheels (tractor-trailer turntables).
- Steel girth gears (girth tyres) on rotary kilns and crushing mills.
- Sugar mill plain bearings, when fluid lubricants have shown a tendency to leak.

Usable temperature range in continuous service is -10°C and 80°C.

Pack sizes: 20kg. (Black in colour)

Typical Characteristics

Product	Code	NL GI Grade	Type	Colour	Appear.	Penet. Worked 25°C	Drop Point °C	Oil Vis. cSt @ 40°C	Timken OK Load kg	Additives
Delo Grease ESI	540827	2	Lithium complex	Red	Smooth & tacky	285	266	261	36.2	EP
Delo HD Moly 3%	540730	2	Lithium complex	Grey/black	Stringy	280	265	383	32	Moly, EP
Delo Starplex EP 2	510859	2	Lithium complex	Red	Tacky	280	230+	22	20	EP, Tack
EPC 00	549334	00	Lithium	Brown	Semi-Fluid	405-425	Semi Fluid	153	22	EP
Multifak EP 2	540812	2	Lithium	Light Brown	Buttery	280	195	208	18	EP
Multifak EP 0	540810	0	Lithium	Light Brown	Buttery	370	180	208	18	EP
Texclad 2	510321	2	Calcium	Black	Smooth	280	88	875	-	Graphite, Moly, Tack
Ultra Duty Grease 2	510326	2	Lithium	Red	Tacky	280	180	380	32	EP, Tack

CHAIN BAR LUBRICANTS



Chain and Bar Oil

541600

Description:

A tough, tacky lubricant designed for the lubrication of the chain, bar and sprocket of all types of chain saws 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.

Applications:

Can include;

- Chain, bar and sprocket on all types of chainsaws, using either hand operated or automatic oilers.
- Chain driven machinery, including lumber carriers and farm equipment.

Pack sizes:

200 litre, 18 litre, 4 litre.

Rotary Vacuum Pump (RVP) Oils

Regal R&O 46 & 68

ISO 46- 520011

ISO 68- 520012

Rotary Vacuum Pump Oil 68 (rebranded Regal R&O 68)

ISO 68 -571150

Rotary Vacuum Pump Oil 68 is suitable for use in Masport rotary vacuum pumps used in dairy farm milking machine applications.

It is manufactured from high quality base oils and offers oxidation resistance, rust and corrosion protection.

It is non-emulsifying (i.e. the water separates out from the oil) and does not contain anti-wear type additives.

It can be used in other types of vacuum pumps where the viscosity and lubricant type are suitable.

Note: In very cold ambient operating temperatures a thinner oil may be required and in these situations, **Regal R&O 46** (Viscosity Grade - ISO 46) may be a suitable alternative.

Background:

Prior to 2007, Caltex marketed an ISO 68 viscosity grade oil called **RVP Oil HD** (now known as Regal R&O 68) for Rotary vacuum pumps fitted with non-circulating lubrication systems, and an ISO 46 viscosity grade called **RVP Circulating Oil** (now known as Regal R&O 46) for pumps with recirculating lubrication systems. This was based on historical Masport requirements however in more recent documentation, they indicate that an ISO 68 grade is suitable for both types of systems and the use of the lighter grade is only required when very cold conditions are encountered. Our experience has confirmed that the ISO 68 grade appears suitable for both types of lubrication systems.

For customers wishing to continue using products defined under the earlier recommendations, the option is still there as both products are readily available under the names of Regal R&O 68 and Regal R&O 46.

Available Pack sizes:

Regal R&O 46: 200 litre and 18 litre

Rotary Vacuum Pump Oil 68: 18 litre

Regal R&O 68: 200 litre, 18 litre and 5 litre





SOLVENTS

Regular Kerosine

400234

Caltex Regular Kerosine is a product intended for use as a general purpose cleaning solvent and as a fuel in most flued domestic heating appliances employing vaporising or atomizing burners.

Dangerous Goods Class 3(b)

Pack sizes:

205 litre, 20 litre.

DEGREASERS

Degreasing Fluid

541645

An emulsifiable compound for workshop and machine cleaning operations.

It consists of a petroleum solvent (mineral turpentine) combined with a specially selected biodegradable emulsifier.

It is intended to remove grease, grime and oil from engine parts, chassis, lawn mowers, motor bikes, chain saws etc. Also used in cleaning garage and factory floors, concrete paths and paint brushes. The greasing fluid, dissolved grease and dirt may then be removed from surfaces by swabbing or hosing with cold water. It should not be used on bitumen paths or driveways.

Degreasing Fluid is a combustible liquid, Dangerous Goods Class 3(b). It has a flash point of 39°C and should be kept away from ignition sources. Refer to the Product Data sheet and MSDS for handling and disposal guidelines.

Pack size:

205, 20 litre.



SOLUBLE CUTTING OIL

Aquatex® 3180

530710

Description: A general purpose soluble oil formulated with special base oils, coupling agents and a high level of emulsifiers. Aquatex 3180 will form very stable emulsions, even with relatively hard water. It exhibits high levels of detergency and reserve alkalinity, low foaming tendencies, and contains a biocide to combat a wide spectrum of micro-organisms commonly found in sumps and reservoirs.

Application & General machining: 5 – 10%

Dilution Ratio: Grinding: 5%

Pack sizes: 20 litre.

Emulsion Preparation: A minimum of two-thirds of water to be used in the emulsion should be charged (at room temperature) into a separate mixing vessel. Slowly add the amount of oil required to obtain the correct emulsion concentration, with thorough mixing. Remember O I L (Oil In Last) to avoid forming an invert emulsion and, where possible, use automatic mixers. Caltex Aquatex 3180 is formulated to be compatible with water up to 200 mg/L hardness. For best results, water of low hardness should be used in emulsion preparation and make-up. Hard water tends to deplete the emulsifiers, resulting in surface scum and soap formation over extended periods of time.

Note: *Water-containing metalworking fluids such as soluble oil emulsions should never be used for machining operations on magnesium or magnesium-containing alloys as a fire or explosion hazard may exist.*

Refer to Product Bulletin for specific information regarding system cleaning, emulsion monitoring and removal of tramp oil and other contaminants.



Oil Analysis Programme

A sophisticated, rapid oil analysis early warning system which has been developed to diagnose impending equipment problems before potentially serious damage occurs. The results of oil analysis are evaluated to determine equipment wear, the condition of the oil and indicate mechanical faults.

A detailed equipment report gives specific maintenance recommendations.

It can be used for all types of mechanical equipment with a closed lubrication system operating in a wide range of industries including marine. It can prevent major equipment failures, predict impending equipment failures, assist in maintenance scheduling and establish realistic oil change intervals.

Samples are analysed in New Zealand ensuring rapid return of result information. Notification is by email and results can be sourced on-line at any time.

Sold in kits of 12 samples. (Price includes all costs involved including postage if mailed in New Zealand).

Contact Caltex Lubricants Technical or your local Caltex Lubricant Distributor for further information.



Engine Oil Viscosity Classification J300

SAE Viscosity Grade	Low-Temperature (°) Cranking Viscosity ² , mPa-s Max	Low-Temperature (°) Pumping Viscosity ³ , mPa-s Max With No Yield Stress	Kinematic Viscosity ⁴ (mm ² /s) at 100°C Min	Kinematic Viscosity ⁴ (mm ² /s) at 100°C Max	High Shear Viscosity ⁵ mPa-s at 150°C and 10 ⁶ s ⁻¹
0W	6200 at -35	60,000 at -40	3.8	-	-
5W	6600 at -30	60,000 at -35	3.8	-	-
10W	7000 at -25	60,000 at -30	4.1	-	-
15W	7000 at -20	60,000 at -25	5.6	-	-
20W	9500 at -15	60,000 at -20	5.6	-	-
25W	13000 at -10	60,000 at -15	9.3	-	-
8	-	-	4	<6.1	1.7
12	-	-	5	<7.1	2.0
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 and 10W-40 grades)
40	-	-	12.5	<16.3	3.7 (15W-40, 20W-40, 25W-40 and 40 grades)
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. ASTM 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, ASTM D4741 and D5481.

Axle and Manual Transmission Lubricant Viscosity Classification J306

SAE Viscosity Grade	Maximum Temperature for Viscosity of 150,000 cP, °C	Viscosity (cSt) @ 100°C		Approx. Equivalent ISO Grading
		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)

Axle and Manual Transmission Lubricants SAE J308

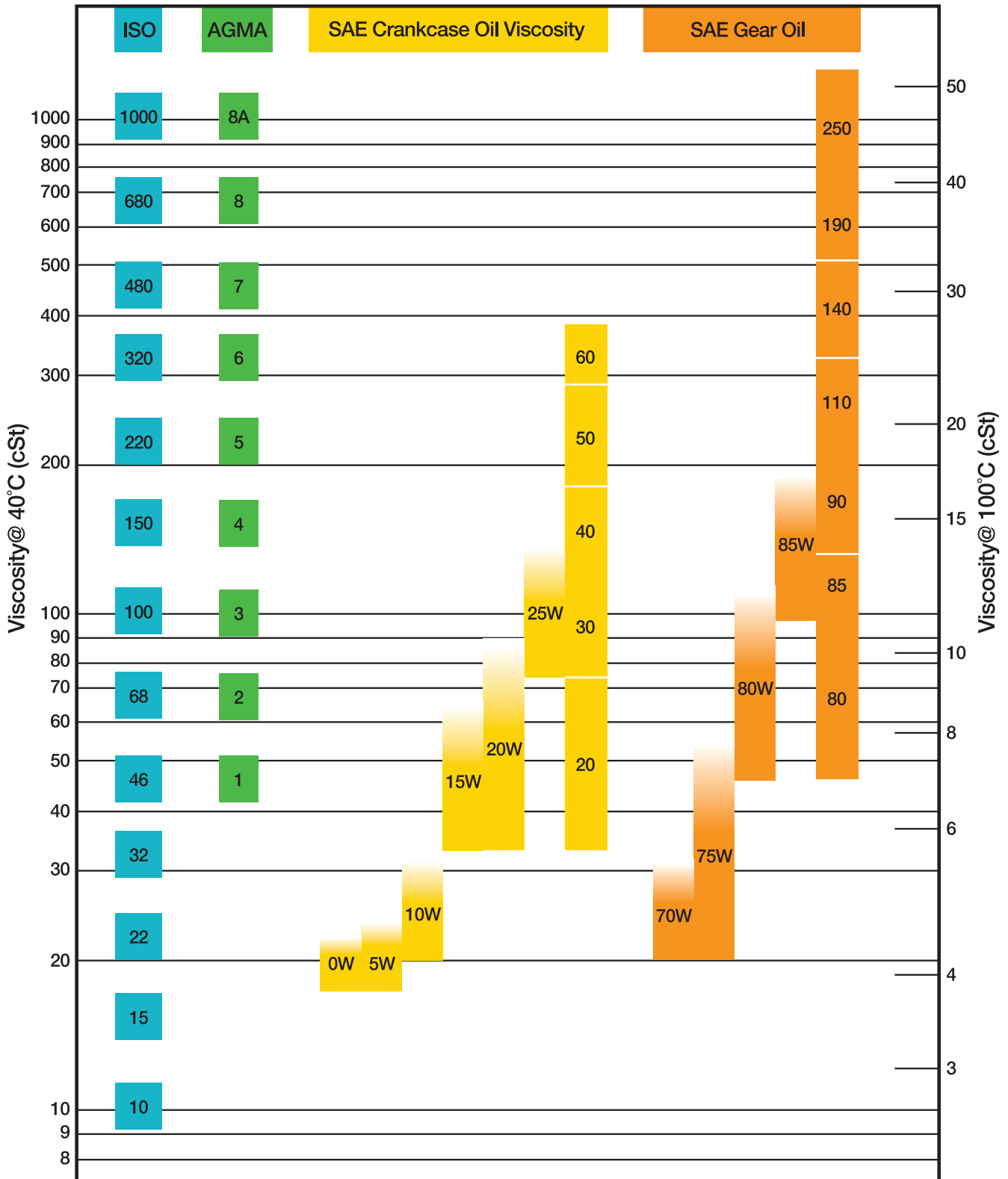
Classification	Type	Typical Application
GL-1*	Straight mineral oil	Some automotive manual transmissions under mild service.
GL-2*	Usually contains fatty material.	Worm drives and some industrial gear boxes.
GL-3*	Contains mild EP additives.	Manual transmissions and spiral bevel final drives under moderate 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 the 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

COMPARATIVE VISCOSITY CLASSIFICATIONS



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.

NLGI GREASE CLASSIFICATION



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

GREASE COMPATIBILITY CHART

	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	I	I	I	X	C	B
Lithium Complex	B	I	B	B	I	I	I	C	X	B
Polyurea	B	I	I	I	I	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

S 'Service' classification (primarily for Petrol engines)

Description		Related Specifications
SN	Introduced in 2010 along with the Resource Conserving classification and ILSAC GF-5	ILSAC GF-5
SM	Introduced in 2004 to provide improvements in oxidation resistance, deposit control, anti-wear 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
OBSOLETE CATEGORIES		
SG*	Introduced in 1989 to provide improvements in engine deposits, oil oxidation, and engines 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-153 B/C/D GM: 6048M, Chrysler: MS 6395, MIL-L-46152 B/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	Introduced in 2010 to provide improvements in turbocharger protection, piston cleanliness, compatibility with ethanol blend fuels, fuel economy durability and emission control system durability.
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 sulphur. Released in 2004.
GF-3	Effectively API SL plus the Sequence VI B fuel economy test. Released in 2000..
GF-2 PLUS	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.

API ENGINE SERVICE CLASSIFICATIONS



C 'Commercial' classification (primarily for Diesel engines)

Description	Related Specifications / Tests
<p>CK-4 Introduced Dec 2016 for high-speed, 4-stroke diesel engines providing improved, oxidation resistance, emission control system durability, wear protection, shear stability and soot related viscosity increase. May be used in place of CF-4, CG-4, CH-4, CI-4, CI-4 plus and CJ-4 oils.</p>	<p>Cummins CES 20086, Mack EOS 4.5 Volvo VDS 4.5</p>
<p>FA-4 Introduced Dec 2016 for use only in specific make/model, high-speed, 4-stroke diesel engines manufactured after 2016. API FA-4 oils are blended to a HTHS viscosity range of 2.9cP-3.2cP to assist in reducing GHG emissions by reducing internal fluid friction. They are NOT backward compatible and so cannot be used in place of any other API category.</p>	<p>Cummins CES 20086 Mack EOS 4.5 Volvo VDS 4.5</p>
<p>CJ-4 Introduced in 2006 for high-speed, 4-stroke diesel engines designed to meet U.S. 2007 model year on-highway exhaust emission standards as well as for previous model years. Especially effective at sustaining emission control system durability where DPF's and other advanced after-treatment systems are used.</p>	<p>Cummins CES 20081, Mack EO-O Premium Plus 07</p>
<p>CI-4 PLUS Introduced 2004 as a sub-category of API CI-4 and includes more severe shear stability requirements and a pass in the Mack T-11 test with limits as defined in Mack EO-N Premium Plus. May be used in place of CD, CE, CF-4, CG-4, CH-4 and CI-4 oils.</p>	<p>Cummins CES 20078, Mack EO-N Premium Plus 03</p>
<p>CI-4 Introduced in 2002 for four-stroke heavy-duty diesel engines meeting 2004 exhaust emission 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.</p>	<p>Cummins CES 20078 Mack EO-N Premium Plus</p>
<p>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</p>	<p>Cummins M11, Mack EO-M, EO-M Plus, Caterpillar 1P</p>
OBSOLETE CATEGORIES	
<p>CG-4* Introduced in 1994 for 4-stroke heavy-duty diesel engines meeting 1994 U.S. exhaust emission standards. May be used in place of API CD, CE and CF-4.</p>	<p>Caterpillar 1N, Mack EO-L</p>
<p>CF-4* For 4-stroke heavy-duty engines manufactured since 1990. CF-4 oils may be used in place of CC, CD or CE oils.</p>	<p>Caterpillar 1K</p>
<p>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.</p>	<p>Caterpillar 1M-PC, Detroit Diesel 6V-92TA</p>
<p>CF* Introduced in 1994 for indirect injected diesel engines. CF oils can be used when CD is recommended.</p>	<p>Caterpillar 1M-PC</p>
<p>CE* For 4-stroke heavy-duty diesel engines manufactured since 1983. Can be used when previous API diesel engine category oils are recommended.</p>	<p>MIL-L-2104 D/E, MIL-L-45199 Mack:EO-K/2;Cummins NTC400</p>
<p>CD-II* For severe duty two stroke diesel engines. CD-II oils meet all of the performance requirements of CD.</p>	<p>MIL-L-2104 D, Detroit Diesel: 6V-53T</p>
<p>CD* For n/a, t/c or s/charged diesel engines. Introduced in 1955.</p>	<p>MIL-L-2104 C/D,MIL-L-45199</p>
<p>CC* For moderate duty diesel and petrol engines. Introduced in 1961.</p>	<p>MIL-L-2104 B</p>
<p>CB*</p>	<p>MIL-L-2104A Supp. 1</p>
<p>CA*</p>	<p>MIL-L-2104A</p>

ACEA ENGINE SERVICE CLASSIFICATIONS



ACEA is an acronym for the “Association des Constructeurs Europeen d’Automobiles” and is the European equivalent to the North American API and they develop and maintain their own engine oil performance rating system, referred to as “sequences”.

The members of ACEA are: BMW; General Motors; Renault; DaimlerChrysler; MAN; Scania; DAF Trucks; Porsche; Volkswagen; Fiat; PSA; Volvo and Ford of Europe. The first Sequences (ACEA 96) were released for use from Jan 1, 1996.

The current range of performance ratings for the various petrol and diesel engines are as follows:

A/B Petrol and Diesel Engine Oils

Description	
A1/B1	Stable, stay-in-grade oil intended for use at extended drain intervals in petrol engines 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 mPa.s for xW/20 and 2.9 to 3.5 mPa.s for all other viscosity grades. These oils are 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 petrol 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 petrol and direct injection diesel engines, but also suitable for applications described under A3/B3.
A5/B5	Stable, stay-in-grade oil intended for use at extended drain intervals in high performance petrol car and 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 may be unsuitable for use in some engines. Consult owner's manual or handbook if in doubt.

E: Heavy Duty Diesel Engine Oils

Description	
E4	Stable, stay-in-grade, providing excellent control of piston cleanliness, wear, 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 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 I, Euro II, Euro III, Euro IV, Euro V and Euro VI 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 sulphur 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 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 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, Euro V and Euro VI 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/2012_ACEA_Oil_Sequences.pdf

C: Catalyst Compatibility 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 & light van diesel and petrol engines requiring low friction, low SAPS oils with a minimum HTHS viscosity of 2.9 mPa.s. These oils will increase 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 & light van diesel and petrol engines designed to be capable of using low friction, low viscosity oils with a minimum HTHS viscosity of 2.9 mPa.s. These oils will increase 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 & light van diesel and petrol engines, with a minimum HTHS viscosity of 3.5 mPa.s. These oils will increase DPF and TWC life. 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 & light van diesel and petrol engines requiring low SAPS oil with a minimum HTHS viscosity of 3.5 mPa.s. These oils will increase 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 Sulphated Ash, Phosphorus, Sulphur.
 DPF is Diesel Particulate Filter
 TWC is Three Way Catalyst
 HTHS is High Temperature / High Shear rate viscosity

Two Stroke Petrol 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 is exhaust smoke and exhaust system blocking
FD	is superior to FC is high temperature detergency

Four Stroke Motorcycle Petrol 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, SN, or ILSAC GF-1, GF-2, GF-3, ACEA A1/B1, A3/B3, A3/B4, A5/B5, C2, C3, C4 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 sulphur.

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 sulphur 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

Fire Safety

All petroleum products will burn if conditions are suitable. For instance, petrol will catch fire more readily than lubricating oil. 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 NZS 5433 into flammable liquids.

Flammable liquids are defined by the New Zealand Code for the Transport of Dangerous Substances on Land as Class 3 liquids which are subdivided into the following packaging groups:

Packaging Group	Flash Point (Closed Cup)	Initial Boiling Point	Products Include
I	Straight mineral oil	<35°C	Volatile Solvents
II	< 23°C	>35°C	Petrol, Toluol, Medium Volatility Solvents
III	>23°C to <61°C	>35°C	Kerosines, Mineral Turps, Jet-A1, Most Low Volatility Solvents.

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 (Closed Cup)	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.

Particular care must be exercised when working with products from Packaging Groups I, II, III. 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 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.

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. The following outlines these potential hazards and the first aid steps which should be taken.

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. Specific questions relating to the health and handling aspects of Caltex products should be directed to your Caltex representative. For guidance a general classification of products and their potential hazards is given in the table on the following page.

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.

FIRST AID GUIDE



Group	Product	Potential Hazard		First Aid Treatment
Volatile Fuels and solvents	Petrol, Volatile Solvents, Degreasers	Ingestion	Moderately toxic to adults, can be extremely toxic to children. Will irritate mouth and intestines.	Do not induce vomiting. Give water to drink and get medical aid.
		Inhalation	Extremely hazardous; use only in properly ventilated areas.	Move to fresh air. Keep warm and rested. If unconscious give oxygen. If breathing stops give artificial respiration
		Aspiration	Extremely hazardous, can occur during vomiting.	Get medical aid immediately.
		Skin	Primary irritants which may cause dermatitis	Wash with soap and warm water. Drench contaminated clothing with water and then remove it. Wash before re-use.
		Eyes	Can severely irritate the eyes. Some solvents can damage the eyes.	Wash with copious volumes of water for at least fifteen minutes. Seek medical advice immediately.
Non-volatile Fuels and solvents	Kerosines, Diesel	Ingestion	Moderately toxic. Fuels and solvents can irritate the mouth and intestines.	Do not induce vomiting. Give water to drink and seek medical advice.
		Inhalation	No significant risk because of low volatility.	
		Aspiration	Extremely hazardous, can occur during vomiting.	Get medical aid immediately.
		Skin	Primary irritants which may cause dermatitis.	Wash with soap and water. Remove contaminated clothing and wash before re-use
		Eyes	Will irritate the eyes.	Wash with copious volumes of water. Seek medical advice.
Oils	Lubricating Oils, Cutting Oils	Ingestion	Low toxicity. Particular additives may cause moderate toxicity.	Do not induce vomiting. Give water and seek medical advice.
		Inhalation	No significant risk because of low volatility.	
		Aspiration	Moderate risk due to high viscosity.	Get medical aid.
		Skin	Prolonged and repeated contact with oils may cause dermatitis. Prolonged or repeated contacts with aromatic extracts and some naphthenic oils may cause skin cancer.	Wash with soap and warm water. Remove contaminated clothing and wash before re-use.
		Eyes	Oils may give slight irritation.	Wash with copious volumes of water. Seek medical advice.
Greases		Ingestion	Very low toxicity with the exception of special greases containing metal additives.	
		Skin	May cause slight irritation to sensitive skins.	Wash with soap and warm water. Grease gun injuries require immediate hospital treatment.
		Eyes	May cause slight irritation.	Wash with copious volumes of warm water. Seek medical advice.

AAMA:	American Automobile Manufacturers Association – formerly the MVMA (Motor Vehicle Manufacturers Association) – USA
ACEA:	Association des Constructeurs Europeens d'Automobiles (Association of Automobile Constructors in Europe), formerly CCMC (Committee of Common Market Automobile Manufacturers)
Additive:	Any material that is incorporated into a product at relatively low concentration to impart new properties or enhance existing properties.
Anti-foam Agent:	Additive used to suppress the foaming tendency of petroleum products in service. It may be a silicone oil or polymer which breaks up bubbles on the oil surface or reduces the number of small bubbles trapped within the oil.
Anti-wear (AW) Agent:	Additive that is active in preventing damage caused by occurrence of solid phase welding between sliding surfaces without local surface melting.
API:	American Petroleum Institute
API Service Classification:	System of letter designations agreed on by API, SAE and ASTM to define broad classes of engine 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 characterized by the presence of, the benzene ring.
Ash:	Metallic deposits formed in the combustion chamber during high-temperature operation.
Ash (Sulphated) - see Sulphated Ash	
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 (mg KOH/g). This property is used to indicate the capacity of an oil to counter the corrosive effects of acidic products of combustion.
BMEP:	Brake Mean Effective Pressure
Bore Polishing:	Area of polishing on the surface finish of the cylinder bore or liner in an engine to a mirror-like appearance. This results in the piston oil control ring being unable to control oil consumption.
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.
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.
CCMC:	Committee of Common Market Automobile Constructors, now called ACEA (Association of Automobile Constructors in Europe)
CCS:	Cold cranking simulator
CI:	Compression ignition (engine)
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.
Corrosion Inhibitor:	Additive that protects metal surfaces from chemical attack by water or other contaminants.
Detergency:	Ability of a lubricating oil to reduce or prevent deposits formed under high temperature conditions or by the action of acidic contaminants on the oil.
DEO:	Diesel engine oil
Dispersancy:	Ability of an oil to disperse and suspend potential deposit-forming materials so that they can be removed from the system when the oil is drained.
EMA:	Engine Manufacturers Association (USA)
EOLCS:	Engine Oil Licensing and Certification System

Exhaust Gas Recirculation (EGR):	System to reduce automotive emission of nitrogen oxides (NOx). 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.
Flash Point:	The lowest temperature at which vapors rising from a sample will ignite momentarily on application of a flame under specified conditions.
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.
HDDO:	Heavy duty diesel engine oil
HDEO:	Heavy duty engine oil
HDEOCP:	Heavy Duty Engine Oil Classification Panel
HTHS:	High temperature high shear rate viscosity
IDI:	Indirect diesel injection
ILSAC:	International Lubricant Standardization and Approval Committee
Insolubles:	Contaminants found in used oils due to dust, dirt, wear particles or oxidation products. Often measured as pentane, toluene or benzene insolubles to characterize the nature of the insoluble material.
JAMA:	Japanese Automobile Manufacturers Association
JASO:	Japanese Automobile Standards Organization
Kinematic Viscosity:	Measure of a fluid's resistance to flow through a capillary tube under gravity at a specific temperature (usually 40°C or 100°C).
KOH:	Chemical symbol for the alkaline compound, potassium hydroxide.
LFG:	Landfill gas
LFGEO:	Landfill gas engine oil
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 U.S. Military Specifications.
Multigrade:	An oil that meets the low temperature viscosity limits of one of the SAE W numbers as well as the 100°C viscosity limits of one of the high temperature numbers.
Multiviscosity:	See Multigrade
MVMA:	Motor Vehicle Manufacturers Association (USA) now AAMA (American Automobile Manufacturers Association)
Naphthenic:	Having the characteristics of naphthenes, which are saturated hydrocarbons containing molecules with at least one closed ring of carbon atoms.
Newtonian Flow:	Flow in a fluid where the shear rate (flow rate) is directly proportional to the shearing force (pressure).
NGEO:	Natural gas engine oil
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.
Nitration:	Process whereby nitrogen oxides attack petroleum fluids at high temperatures, often resulting in viscosity increase, corrosion and deposit formation.
OEM:	Original equipment manufacturer
Oxidation Stability:	Ability of a lubricant to resist oxidation and deterioration resulting from high temperatures and/or exposure to air.
Paraffinic:	Having the characteristics of paraffins, saturated hydrocarbons of open chain structure.
PCEOCP:	Passenger Car Engine Oil Classification Panel

PCMO:	Passenger car motor oil
PCV System:	Abbreviation for Positive Crankcase Ventilation system, a system for internal combustion engines designed to provide positive scavenging of crankcase vapors and return them to the intake system.
PIB:	Polyisobutylene
Pour Point:	Lowest temperature at which a liquid petroleum product will flow when it is cooled under the conditions of the standard test method.
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.
PPD:	Pour point depressant
Residual Fuel:	Fuel composed mainly of materials remaining after distillation of crude oil. Also referred to as "Fuel 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, Inc
SAE Grade:	Grade indicating the viscosity range of a crankcase, transmission or rear axle lubricant, according to systems designed by SAE.
Series 3:	Abbreviation for the discontinued Caterpillar Tractor Company crankcase oil specification "Superior Lubricants (Series 3)".
Shear Stability:	Ability of a lubricant such as a grease or VI improved oil to withstand mechanical shearing without being degraded in consistency or viscosity.
SHPD:	Super high performance diesel (oil)
SI:	Spark ignition (engine), or Systeme International d'Unites (International System for Units)
Sludge:	Soft deposits, usually dark colored, formed in lubrication systems, mainly consisting of oxidised lubricating oil components, water and, in internal combustion engines, carbonaceous residues from fuel combustion.
Solvent Neutral Oil (SNO):	Base oil manufactured from solvent refined paraffinic lube distillates.
Sulphated Ash:	Residue that remains after a sample of oil has been oxidised 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.
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.
Top dead center (TDC):	Position of the piston at its highest point in the cylinder, where the piston stops and turns around.
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.
VHVI:	Very high viscosity index
VI:	Viscosity index
VII:	Viscosity index improver
Viscosity:	Measure of the resistance to flow, or internal friction, of a fluid. Viscosity changes with temperature so the temperature at which the measure was made must always be specified. See also Apparent Viscosity and Kinematic Viscosity.
Viscosity Index (VI):	An arbitrary scale used to show the relative magnitude of viscosity changes with temperature. Higher VI oils have less change in viscosity with temperature.
Viscosity Index Improver (VII):	Lubricant additive, usually a high molecular weight polymer, that reduces an oil's tendency to change viscosity with change of temperature.
Wet clutch:	A clutch where the clutch plates operate immersed in oil.
ZDDP:	Zinc dialkyl dithiophosphate

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Delo® 400 XLE Synblend	14	Havoline® ProDS ECO 5 SAE 0W-20 & 5W-30	7
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Delo® Gold Monograde SAE 30	15	Havoline® Ultra R SAE 5W-30	6
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Delo® Syn-Trans XV SAE 75W-90	25		
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Delo® XLC Antifreeze/Coolant	32		
Delo® XLC Antifreeze/Coolant Premixed 50/50	32		
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Texclad® 2	45
Textran® TDH Premium (replaced by 1000 THF)	27
Thuban GL 5 EP (replaced by Delo Gear EP 5)	30
Torque Fluid 414, 434, 454 (replaced by Delo TorqForce)	26
Translube LD	26
Two Stroke Lawnmower Oil	11

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Ultra Duty® Grease 2	43
Ursa Ultra XLE SAE 10W-40	16
Used Oil Analysis	50

V

Veritas 800 Marine	20
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W

Way Lubricant X 68	40
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