carlson®

OIL AND LUBRICANTS CATALOGUE

ABOUT US

Filson s.r.o. is a Czech company that was founded in 1993 and since then has been managed as a medium-sized family business. As a specialized wholesaler and distributor of a wide range of car accessories, in the first years of our activity we focused mainly on distributing products of European manufacturers to our domestic market. From the very beginning, we have strived to offer our customers not only a wide range of quality products, but also excellent service. In order to respond to the challenges and increasing demands of a growing market, Filson has been operating its own manufacturing plant in the north of the Czech Republic since 2009. In this plant, we specialize in the in-house production and development of high quality oils, lubricants and car cosmetics, which are supplied to most retail chains and petrol stations in the Czech and Slovak Republic. In order to respond to the different wishes and requirements of customers, Filson has introduced not only the Carslon brand, but also the ROX brand, which is designed for customers who prefer a more affordable product range. Over the years, Filson has also developed a special line

of home, garden and patio care products known as the Carlson Garden brand. In 2016, Filson acquired the German car accessories brand Aroso. We now have one of the most comprehensive and broadest ranges in this category in Europe. For this reason, we have also achieved a very dynamic development, so that our products are now delivered to many different locations across Europe. Filson places great emphasis on good customer relations in all European countries. For this reason, the subsidiary Filson Slovakia s.r.o. was founded in 2015 and three years later the German subsidiary Filson Deutschland GmbH. Our company listens to the wishes and requirements of our customers and tries to respond to them by developing and improving our products. This may have contributed to the fact that we were awarded the „Superbrands“ award for the Carlson brand in the Czech Republic for the ninth time since 2014. Our young and ambitious team would like to continue to convince with good products and services in the future and thus expand its activities to the entire European market. We would be happy to have you as our partner.

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INFORMATION ON OUR LABELS

Front side

LOGO
CARLSON logo represents the fluidity and technical innovation of our extensive product range.

PRODUCT NAME
The full product name begins with the product classification in the sub-category followed by the viscosity class and API/ACEA classification.

API AND ACEA CLASSIFICATION AND SEGMENTATION
Highlights the ACEA and API classification of the product.

PACKAGING CONTENTS
Indicates the volume of the contents of a particular pack size.

FUNCTIONS
These are the main product benefits when using CARLSON engine oil.

PRODUCT NUMBER
Internal order number.

PRODUCT COMPOSITION
The specific product composition is classified as mineral, semi-synthetic or full synthetic engine oil.

INFORMATION ON OUR LABELS

Back side

PRODUCT NAME

The full product name begins with the product classification in the subcategory followed by the viscosity grade and API/ACEA classification.

INFORMATION ON USE, HEALTH AND ENVIRONMENT

Safety instructions for the use of oils and liquids and information on legislation.

SPECIFICATION LEVEL

The specification level indicates the performance of the lubricant. It consists of API and ACEA classifications.

PICTOGRAMS

These pictograms highlight the environmental legislation in each country.

EAN CODE

The EAN code is the identification code and barcode of the goods.

UFI CODE

An identifier required on the labels of all products classified as hazardous based on health or physical effects.

PRODUCT NUMBER

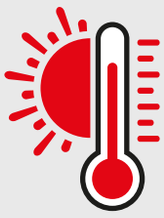
Internal order number.

INFORMATION ON ENGINE OILS

VISCOSITY CLASSIFICATION

Viscosity is a variable quantity that depends on temperature. During the operation of an automotive engine, changes in operating temperatures occur, among other things. In the interests of good lubrication efficiency, it is important that the oil viscosity varies as little as possible as a function of temperature.This dependence is determined by the so-called viscosity index. The higher the index, the lower the dependence of viscosity on temperature changes. The SAE (Society of Automotive Engineers, USA) specification is used to characterise the viscosity properties of engine oils. For the classification of oils, this standard uses 6 winter classes, denoted by a number and ‚W', and 5 summer classes, denoted by a number.

SUMMER CLASSES



20
30
40
50
60

WINTER CLASSES

0 W
5 W
10 W
15 W
20 W
25 W

The winter marking value determines the oil's behaviour at low temperatures (e.g. SAE 15 W oil has a pumping limit of -25 °C). **The summer marking value** determines the use of the oil at summer temperatures. If only one grade is used in the marking, it means that it is a monograde oil (summer or winter). When a combination of summer and winter grades is used (e.g. 5 W-40), it is a multigrade (all-season) oil. Today, multigrade engine oils are almost exclusively used. For our climate zone, the most common grade is SAE 15 W-40.

PERFORMANCE CLASSIFICATION

The performance specification characterises the immediate and long-term properties of the engine oil under various forms of operating load. Various properties are evaluated, such as oxidation stability, evaporation, wear and deposit protection, corrosion protection, fuel economy, etc. The following standards are used to indicate the performance category of engine oils:

a) API classification (American Petroleum Institute, USA)
b) ACEA (Association des Constructeurs Européens d' Automobile, EU)
c) company standards of engine and vehicle manufacturers (VW, MB, MAN, VOLVO, TATRA)
d) MIL-L classification (US Army standards)

CURRENTLY, API, ACEA AND ENGINE AND VEHICLE MANUFACTURERS' CORPORATE STANDARDS CARRY THE MOST WEIGHT.

A) API CLASSIFICATION

According to this standard, engine oils are distinguished according to their use into oils for petrol engines, designated by the letter „S" (Service), and oils for diesel engines, designated by the letter „C" (Commercial). Most oils are suitable for both engine types and are then marked with a combination of both letters, e.g. SL/CF.

PERFORMANCE CLASSIFICATION

Performance classes for petrol engines

SG Engine oils manufactured between 1988 and 1993 that meet the most stringent requirements to minimize wear and sludge formation.

SH However, oils with the same properties as SG are tested to more demanding standards. Designed for engines manufactured in 1996 and earlier.

SJ Oils for engines built in 2001 and older.

SL Oils that outperform API SJ with improved fuel economy and extended drain interval options.

SM Highest quality oils outperforming API SL with increased oxidation stability, increased wear and deposit protection. Introduced in 2004.

SN Oils for modern engines. Aimed at reducing fuel consumption, controlling emissions and protecting the turbocharger. Oils for higher compatibility with exhaust gas treatment systems and protection of engines burning ethanol and E85 fuel. Since 2011.

Performance classes for diesel engines

CF-4 Oils for the most heavily loaded engines of heavy trucks operating in the most demanding conditions. Introduced in 1990.

CG-4 Engine oils for engines manufactured since 1995 with emphasis on meeting emission limits. Oils for the heaviest duty high speed engines operating in the most demanding on and off road conditions.

CH-4 Oils for the heaviest duty high speed engines operating in the most demanding on and off road conditions. Introduced in 1998.

CI-4 Introduced in 2002. Oils for high speed, high load engines with exhaust gas recirculation (EGR) meeting emission limits set from 2004.

CJ-4 Oils for four-stroke turbocharged diesel engines meeting exhaust emission standards from 2010. For engines burning low-sulphur diesel and engines equipped with diesel particulate filters and advanced injection systems.

B) ACEA CLASSIFICATION

ACEA - the Association of European Vehicle Engineers - replaced the CCMC in 1991.

Automobile Designers Association. It was formed in 1972 in response to the fact that API specifications did not fully accommodate European engine types, which differed in design from American engines. Since 2004, the ACEA classification newly divides engine oils into three groups:

- oils for spark-ignition and light-diesel engines, marked „A/B"
- oils compatible with catalytic converters for spark-ignition and light-diesel engines, marked „C"
- oils for high-performance diesel engines, marked „E"

INFORMATION
ENGINE OILS

THE PERFORMANCE LEVEL IS INDICATED BY A NUMBER

The following ACEA performance classes are currently used:

• Oils for petrol and light diesel engines

A1/B1 Oils additivated against piston deposits, sludge formation, wear and oxidation at high temperatures. They meet the requirements for super-light running and fuel economy. They are only suitable for certain engines.

A3/B3 Oils designed for heavy-duty spark-ignition and diesel engines, or for extended drain intervals as recommended by the engine manufacturer.

A3/B4 Oils for high performance spark ignition and direct injection diesel engines, also suitable for the applications described in category B3.

A5/B5 Highly stable oils for extended drain intervals in highly loaded spark-ignition and diesel engines. They meet the requirements for super--light running and fuel economy. Suitable only for specially designed engines.

Note: Category A1/B1 has been removed from ACEA 2016

• Catalytic converter compatible oils - for spark ignition and light diesel engines

C1 Oils for use with DPF (diesel particulate filter) and TWC (triple-acting catalytic converter) catalysts in high performance engines requiring a low viscosity oil with low SAPS (chemical limits) and a high temperature, high shear viscosity (HTHSV) greater than 2.9, MPA.p. The oils extend catalyst life and reduce fuel consumption. They are only suitable for specially designed engines.

C2 Oils for use with DPF and TWC catalysts in high performance engines designed for low viscosity oils with HTHSV greater than 2.9, MPA.p. The oils extend the life of DPF and TWC catalysts and reduce fuel consumption. They are only suitable for specially designed engines.

C3 Oils for use with DPF and TWC catalytic converters in high performance engines. Extend the life of DPF and TWC catalysts. Only suitable for specially designed engines.

C4 Oils for use with DPF and TWC catalysts in high performance engines requiring low SAPS and HTHSV greater than 3.5, MPA.p. The oils extend the life of DPF and TWC catalysts. They are only suitable for specially designed engines.

C5 Oils for use with DPF/GPF and TWC catalysts in high performance engines designed for low viscosity oils requiring medium SAPS, with higher fuel economy requirements and HTHS min 2.6, MPA.s. The oils extend catalyst life and allow extended drain intervals. They are only suitable for specially designed engines.

• Oils for truck diesel engines

E4 The oils provide excellent cylinder cleanliness protection - against wear and soot. They are recommended for high-performance engines meeting Euro I to Euro V emission limits, operating under severe conditions, e.g. extended drain intervals, as recommended by the engine manufacturer. They are suitable for engines without particulate filter and for some engines equipped with exhaust gas recirculation or SCR (Selective Catalytic Reduction of NOx), according to the engine manufacturer's recommendations.

E6 Oils provide excellent cylinder cleanliness protection - against wear and soot. They are recommended for high-performance engines meeting Euro I to Euro V emission limits, operating under severe conditions, e.g. extended drain intervals, as recommended by the engine manufacturer. They are suitable for engines equipped with exhaust gas recirculation without or with diesel particulate filters and for engines with SCR. E6 - quality especially recommended for engines with diesel particulate filters and qualified in combination with low sulphur fuel (max. 50 ppm). However, always follow the engine manufacturer's recommendations.

E7 Oils provide effective protection against piston cleanliness and cylinder oiling. They also provide improved protection against wear, deposits

and soot. They are recommended for high-performance engines meeting emission limits. Euro I to Euro V, operating under severe conditions, e.g. extended drain intervals, as recommended by the engine manufacturer. They are suitable for engines without diesel particulate filters and for most engines equipped with exhaust gas recirculation or SCR, as recommended by the engine manufacturer.

E9 Oils provide effective protection against piston cleanliness and cylinder oiling. They also provide improved protection against wear, deposits and soot. They are recommended for high performance engines, meeting Euro I to Euro V emission limits, operating under severe conditions, e.g. extended drain intervals, as recommended by the engine manufacturer. They are suitable for engines equipped with exhaust gas recirculation (EGR) or SCR system, as recommended by the engine manufacturer. They are particularly recommended for engines with a diesel particulate filter in combination with low sulphur fuel. However, always follow the engine manufacturer's recommendations.

Explanatory notes:
DPF (Diesel Particulate Filter) particulate filter
TWC (Three Way Catalyst) three-way catalyst
EGR (Exhaust Gas Recirculation) exhaust gas recirculation
SCR (Selective Caralysts Reduction) selective catalytic reduction of **NOx**-treatment of exhaust gas composition with urea (AdBlue = 32.5% aqueous urea solution)

C) CAR AND ENGINE MANUFACTURERS' STANDARDS

Many car and engine manufacturers require engine oils to meet additional requirements that are not included in the methodology of previous classifications.

VW (VolksWagen) corporate standards

- VW 500.00 – llight duty oils for gasoline and non-supercharged diesel engines, for SAE 5 W-xx and 10 W-xx grade oils only.
- VW 501.00 – multigrade (multi-range) engine oils without for gasoline and non-supercharged diesel engines.
- VW 501.01 – regular engine oils for gasoline and non-supercharged diesel engines.
- VW 502.00 – light-duty oils for gasoline engines used under severe load conditions, intended for SAE 0 W-xx, 5 W-xx and 10 W-xx oils.
- VW 503.00 -petrol engines of passenger vehicles with extended oil change intervals (30 000 km, 2 years).
- VW 503.01 – p turbocharged petrol engines of passenger vehicles with extended oil change intervals (30 000 km, 2 years), mainly intended for Audi TT and Audi S3.
- VW 505.00 – VW 505. 00 - for turbocharged and non-supercharged diesel engines, suitable for year-round use.
- VW 505.01 – for turbocharged, non-supercharged and diesel engines with PD (pump-jet) system.
- VW 506.00 – turbocharged petrol engines of passenger vehicles with extended oil change intervals (30 000 km, 2 years), mainly intended for Audi TT and Audi S3.
- VW 506.01 – nozzle that use extended drain intervals (30 000, 2 years).
- VW 504.00 – designed for light-duty gasoline engines, they are designed to reduce ash sulphate and promote extended drain intervals, they can also replace oils of the following standards: VW 501.01, VW 502.00, VW 503.00 and VW 503. 01.
- VW 507.00 – designed for light-duty diesel engines, they are designed to reduce ash sulphate and support extended drain intervals, they can also be used to replace VW 506.00 and VW 506.01, for fixed drain intervals they can be used to replace VW 500.00, VW 505.00 and VW 505.01
- VW 508.00/509.00 – oil (508.00 petrol and 509.00 diesel) prescribes 0 W-20 viscosity. These specifications are not backwards compatible and cannot be used in other VW engines - for the new 2.0 TF SI 140 kW and 3.0 TDI CR 160 kW VW/Audi engines.

MB Corporate Standards (Mercedes - Benz)

• MB 226.0 – seasonal oils for diesel non-turbocharged engines of cars and trucks.
• MB 226.1 – year-round engine oils for diesel non-turbocharged engines of cars and trucks.
• MB 227.0 – corresponds to the ACEA E1-98 standard, suitable for non-turbocharged diesel engines, change interval is 15 000 km.
• MB 227.1 – complies with the ACEA E1-98 standard, suitable for non-supercharged diesel engines, change interval is 15 000 km.
• MB 228.0 – seasonal oils for non-supercharged diesel engines of cars and trucks.
• MB 228.1 – year-round oils for non-supercharged and supercharged diesel engines, change interval is up to 30 000 km.
• MB 228.2 – UHPD type engine oils for highly turbocharged diesel engines, have extended drain intervals for light classes up to 45 000 km, while for heavy classes (road tractors) it is up to 160 000 km.
• MB 228.3 – especially for trucks, due to their properties, sulphate, phosphorus and sulphur ash is reduced.
• MB 228.5 – similar area of application as MB 228.3 class, here in addition higher performance characteristics are ensured, they have extended change intervals for light classes up to 45 000 km, while in heavy classes (road tractors) it is up to 160 000 km.
• MB 228.51 – for passenger cars, roughly equivalent to ACEA A3/B4/C3-04 classes.
• MB 229.1 – for gasoline and diesel engines of passenger cars, has higher requirements than ACEA A2/B2 and A3/B3 classes.
• MB 229.3 – engine oils for passenger cars with extended drain intervals (30 000 km).
• MB 229.31 – for passenger cars, class approximately equivalent to ACEA A3/B4/C3-04 standards, reduces sulphur and phosphorus.
• MB 229.5 – for passenger car engines only.
• MB 229.51 – for passenger cars with diesel engines equipped with diesel particulate filters (DPF), for gasoline engines with extended drain intervals, approximately equivalent to ACEA A3/B4/C3-04 standards, reduce ash formation and meet the requirements for „Long life."

Even numbers after the dot (0, 2 and 4) indicate monograde oils, odd numbers (1, 3 and 5) multigrade oils. The above oil change times apply to long-distance transport only.

BMW Corporate Standards

• BMW Spezialöl – for petrol or diesel engines manufactured up to 1998.
• BMW Longlife-98 – for engines manufactured from 1998 onwards - conforms to ACEA A3/B3.
• BMW Longlife-01 – for engines manufactured from September 2001 onwards - conforms to ACEA A3/B3/B4 plus other requirements.
• BMW Longlife-01 FE – for specific engines manufactured from 2001 onwards - conforms to ACEA A3/B3/B4 plus additional requirements (SAE 5 W-30).
• BMW Longlife-04 – for both petrol and diesel engines with and without Diesel Particulate Filter (DPF), manufactured from 2004 onwards - conforms to ACEA C3-04 plus additional requirements.

Fiat Corporate Standards

• Fiat 9.55535-G1 – „Fuel economy" series oils with reduced viscosity for petrol engines, change interval 2 years.
• Fiat9.55535-G2 – high performance oils for petrol engines, change interval 1 year.
• Fiat 9.55535-H2 – high performance oils for petrol engines, change interval 1 year.
• Fiat9.55535-H3 – high performance oils for petrol engines, change interval 1 year.
• Fiat 9.55535-D2 – high performance oils for petrol engines, change interval 1 year.
• Fiat 9.55535-M2 – for petrol and diesel engines.
• Fiat 9.55535-N2 – for petrol and diesel engines including highly turbocharged turbo engines.
• Fiat 9.55535-Z2 – high performance oil for petrol and diesel engines, also applicable for special turbo engines.
• Fiat 9.55535-S1 – „Fuel economy" series engine oil with reduced viscosity designed for diesel engines equipped with DPF system and also for petrol engines, change interval is 2 years, approximately equivalent to ACEA C1/C2 standard.
• Fiat9.55535-S2

Ford Corporate Standards

• Ford WSS M2C913-A – Engine oil for petrol and diesel engines up to production date 03/2002, SAE 5 W-30. This

VISCOSITY CLASSES OF ENGINE OILS ACCORDING TO SAE 300

Viscosity SAE class	Properties at low temperatures				High temperature properties		
	Dynamic viscosity		Pumpability		Viscosity at 100 °C		High shear**
	(mPa.s) max. at °C		(mPa.s) max. at °C*		min. ($mm^2.s^{-1}$)	max. ($mm^2.s^{-1}$)	min. ($mm^2.s^{-1}$)
0 W	6200	-35	60 000	-40	3,8		
5 W	6600	-30	60 000	-35	3,8		
10 W	7000	-25	60 000	-30	4,1		
15 W	7000	-20	60 000	-25	5,6		
20 W	9500	-15	60 000	-20	5,6		
25 W	13 000	-10	60 000	-15	9,3		
20					5,6	<9,3	2,6
30					9,3	<12,5	2,9
40(a)					12,5	<16,3	2,9
40(b)					12,5	<16,3	3,7
50					16,3	<21,9	3,7
60					21,9	<26,1	3,7

a) OW-40, 5 W-40 a 10 W-4,0
b) 15 W-40, 20 W-40, 25 W-40 a 40

* pumping limit temperature

** at 150 °C

specification complies with ILSAC GF-2, ACEA A1-98 and B1-98 and other Ford requirements.
• Ford WSS M2C913-B – Specification is issued in Europe for the original engine oil cartridges used to lubricate gasoline spark ignition engines and diesel engines. HTHS 2.9-3.5, MPA.s, SAE 5 W-30. Oil must meet all requirements of ILSAC GF-2 and GF-3 specifications, ACEA A1 and B1-98-98 specifications and other Ford requirements.
• Ford WSS M2C913-C – Fully backward compatible and recommended for all applications currently requiring Ford specifications.
• M2C913-A a Ford M2C913-B. Conforms to ACEA A5/B5, ILSAC GF-4. A new engine oil providing various other customer benefits such as reduced fuel consumption, cleaner operation and high resistance to biodiesel.
• Ford WSS M2C917-A – Viscosity SAE 5W40 Diesel engine oil for diesel engines with injector pumps (PD).
• Ford WSS M2C934-A – Reduced HTHS and Low SAPS engine oils for vehicles equipped with Diesel Particulate Filter (DPF). Meets ACEA A5/B5 and ACEA C1 specifications.
• Ford WSS M2C934-B – Is the latest Low SAPS (sulphated ash, phosphorus, sulphur) engine oil, meets ACEA A1/B1, ACEA A5/B5, ACEA C1 specifications. Viscosity grade SAE 5 W-30, HTHS = 2.9, MPA.s. Suitable for engines with (DPF).
• Ford WSS M2C937-A – Normal HTHS high viscosity stability medium SAPS oil, suitable for (DPF) and all fuel types. Conforms to API SM/CF, ILSAC GF-4, ACEA A3-04/B4-04/C3-04. Engine oil for the new Focus RS viscosity class SAE 0 W-40.
• Ford WSS-M2C920-A – Engine oil for petrol and diesel engines, viscosity class SAE 0 W-30, equivalent to ACEA A5/B5, ILSAC GF-2.
• Ford WSS-M2C921-A – Engine oil for diesel engines, viscosity class SAE 10 W-30, equivalent to API CH-4 and ACEA E5.
• Ford WSS-M2C925-A – Engine oil for petrol engines only, viscosity class SAE 5 W-20, equivalent to ACEA A1/B1, ILSAC GF-3.

Opel Corporate Standards

• GM-LL-A-025 (B0402095) – designed for gasoline engines in passenger cars, reduces fuel consumption.
• GM-LL-B-025 (B0402098) – designed for diesel engines in passenger cars, reduces fuel consumption.
• GM DEXOS 2 – designed for gasoline and diesel engines with/without DPF system, can replace previous standards GM-LL-A-025 and GM-LL-B-025.

Peugeot Corporate Standards

• B71 2295 – mineral-based for low performance, conforms to ACEA A1/B1 standards.
• B71 2294 – mineral-based for medium performance, conforms to ACEA A3/B3 standards.
• B71 2296 – conforms to ACEA A3/B4 (or ACEA A5/B5) standards, also for oils with reduced viscosity.
• B71 2290 – oil of the „MID SAPS“ series with reduced viscosity, especially designed for diesel engines equipped with DPF system, quality level comparable to the ACEA C2 class of the Renault company standard.
• RN 0700 – designed for petrol engines, conforms to ACEA A3/ B4 (or A5/B5) standards.
• RN 0710 – designed for diesel engines without „DPF“ system. Viscosity class SAE 5 W-40, corresponds to ACEA A3/B4 standard.
• RN 0720 – designed for diesel engines with DPF system, viscosity class SAE 0/5 W-30/40, corresponds to ACEA C4 standard.

Porsche Corporate Standards

• Porsche A40
• Porsche C30

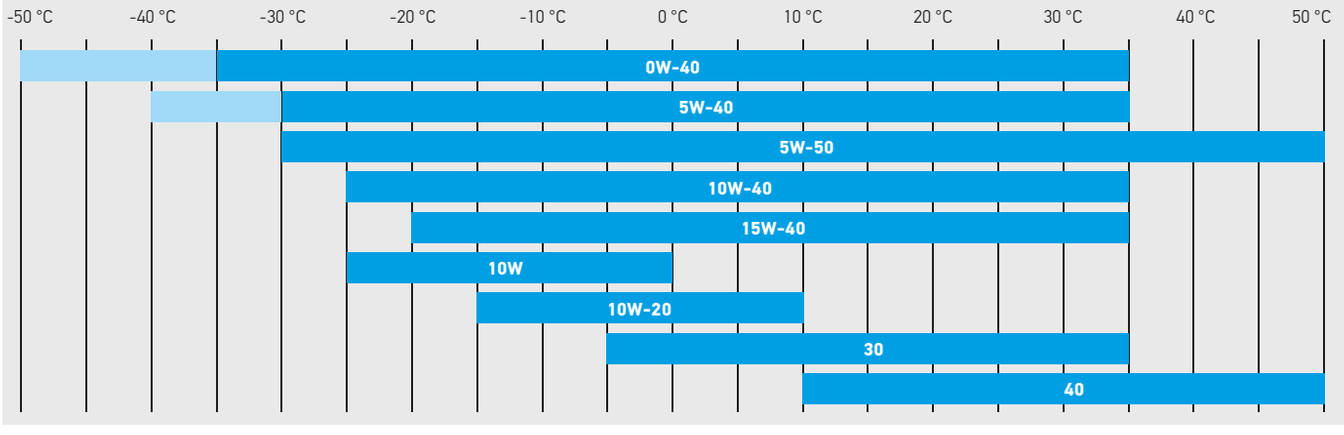
MANN Corporate Standards

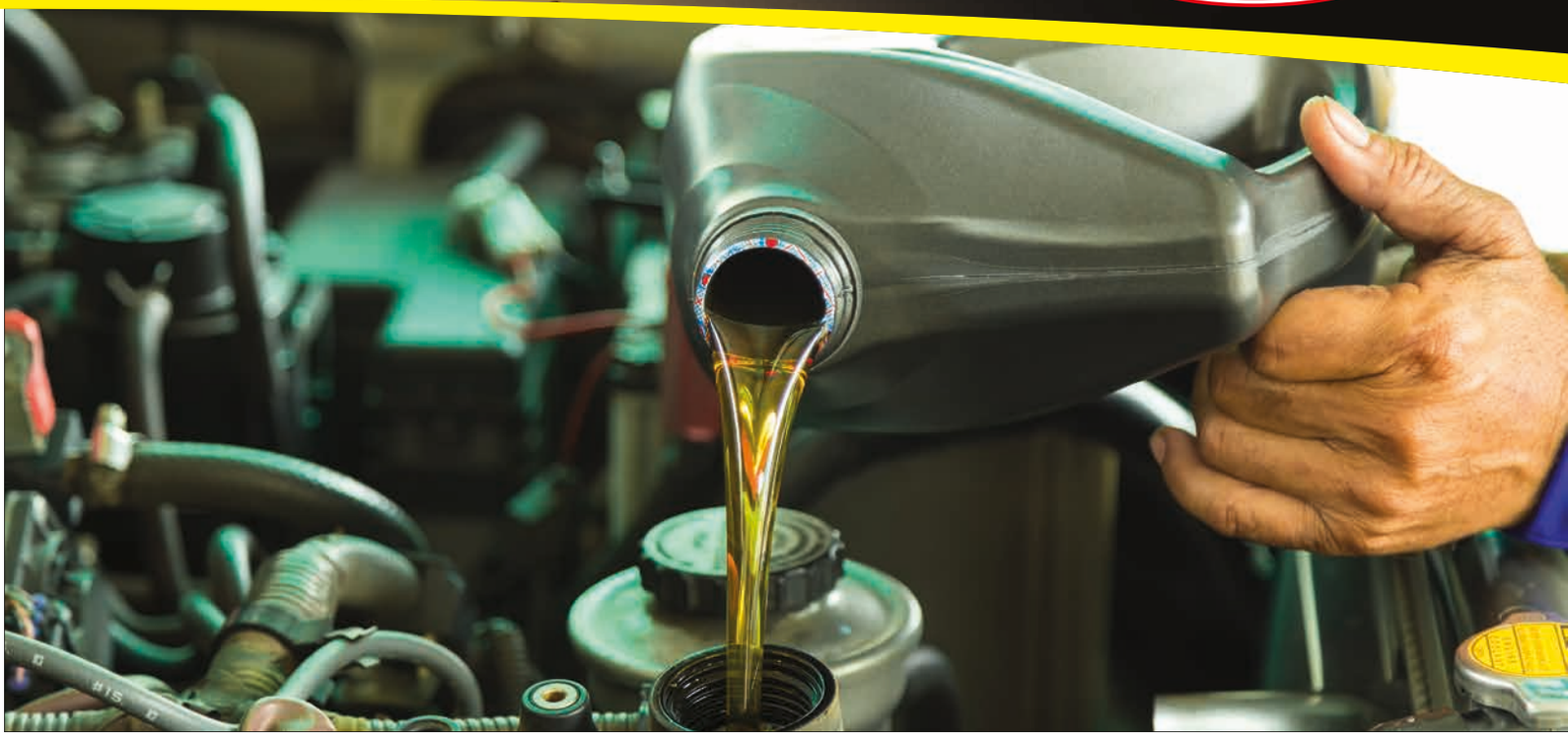
• MAN 271 – approximately comparable to ACEA E2.
• MAN M3275 – approximately comparable to ACEA E3.
• MAN M3277 – approximately comparable to ACEA E4 and MB 228. 5.
• MAN M3477 – approximately comparable to ACEA E6 and MB 228. 51.

Klasifikace ILSAC

• ILSAC GF-1 – was created in 1990 and updated in 1992. It is comparable to API SH with a 2.7% fuel economy requirement.
• ILSAC GF-2 – replaced GF-1 in 1996. Like GF-1 plus must meet requirements for increased fuel economy (VI-A), lower phosphorus content in oil (max 0.1%), lower evaporation (for OW and 5 W). Additionally, foaming, deposit formation and pumpability are tested. GF-2 standards require the following groups of oils: 0 W-30, 0 W-40, 5 W-20, 5 W-30, 5 W-40, 5 W-50, 10 W-30, 10 W-40 a 10 W-50.
• ILSAC GF-3 – The GF-3 standard has more stringent parameters regarding the oil's long-term effects on vehicle emission systems, improved fuel economy and evaporation reduction, viscosity stability

RECOMMENDED VISCOSITY CLASSES OF SAE ENGINE OILS BY EXTERNAL TEMPERATURES





and deposit control. The standard also requires less degradation of additives and reduced oil consumption over the life of the oil.
• ILSAC GF-4 – is similar to the API SM category but requires additional VIB (fuel economy test) sequences per (ASTM D6837).
• ILSAC GF-5 – Introduced in October 2010 for 2011 and older vehicles, it is designed to provide better protection against high temperature deposits in pistons and turbochargers, tighter sludge control, improved fuel economy, improved emission control system seal compatibility, compatibility and protection for ethanol fuelled engines up to E85.

D) MIL-LM CLASSIFICATION

In the commercial vehicle category, the following U.S. Army standards are specified for engine oils:
• MIL-L 2104D
(since 1983) - conforms to API CD-II, multigrade oils for gasoline and two-stroke diesel engines.
• MIL-L 2104E/F
(since 1988) - conforms to API SDICD-II, CE, multigrade oils for gasoline and diesel engines including two-stroke diesel engines. (Approvals for these standards expired in 1997, replaced by API classification).
• MIL-L 46152E
(since 1990) - Corresponds to API SGICC, primarily oils for gasoline engines operating in non-combat conditions, issued for U.S. Government purposes (This standard expired in 1991, replaced by API classification).

Classification of small-displacement spark-ignition two-stroke and marine engines

Two-stroke petrol engines for motorcycles, mopeds, scooters, chainsaws, lawn mowers and marine outboard engines are classified according to engine power according to API, JASO and NMMA standards:The following power classes are used for motorcycles:
• API TA / JASO FA mopeds and other small engines.
• API TB / JASO FB scooters and other heavy duty small engines 50 to 200 cc.
• API TC / JASO FC various heavy duty engines.

For marine engines, NMMA (National Marine Manufactures association) performance classes are used
• NMMA TC-W outdated standard.
• NMMA TC-W II outdated standard.
• NMMA TC-W 3 oils for all marine engines.

ISO oil classification

In the mid-1990 s it became apparent that the JASO specification could not meet the requirements of modern European two-stroke engines. The ISO standards listed below were developed to address this shortcoming. They are based on the relevant JASO+da+ standard.

HOW TO CHOOSE THE RIGHT ENGINE OIL?

1. The first rule of thumb when choosing engine oil is to follow the car manufacturer's instructions in each vehicle's manual. Only the engine (vehicle) manufacturer can responsibly tell you which oil to use. Virtually no manufacturer recommends a particular brand of oil (contrary to competition laws in the European Union). (Car) manufacturers recommend oils according to so-called performance specifications, e.g. API SL/CF, ACEA A3/B3, VW 505.00, MB 229.1 and SAE viscosity specifications, e.g. 15 W-40, 10 W-40. Replacement intervals are then specified for such recommended oils.

2. For oils of the same performance specification, the same drain interval is recommended for petrol and diesel engines at 15,000 (30,000) km or as recommended by the manufacturer.

3. If you do not have the vehicle manual, ask the manufacturer (at the Czech headquarters of the vehicle importer). Remember, the vehicle manufacturer does not recommend the brand of oil, only the performance and viscosity specifications.

4. If the oil meets the performance and viscosity specification (or a higher specification), it can be used. A higher performance level doesn't matter, but is usually more expensive and doesn't yield much.

5. If you are changing low performance specification oil (M5AD, M6AD) for new high performance oil, shorten the change period at the first change (deposits will be washed out).

6. Do not mix mineral oils (SAE 15 W-40, 15 W-50, 20 W-30,40) with synthetic oils (SAE 0 W and 5 W-30, 40, 50).syntetickými (SAE 0 W a 5 W-30, 40, 50).

0W-20 MILLENIUM SYNTH LONGLIFE IV

High quality, low friction, fully synthetic multigrade engine oil

CARLSON® MILL. SYNTH LONGLIFE IV 0W-20

This is a fully synthetic lubricant mandatory for the latest VW / Audi engines. It is formulated to extend the life and maintain the efficiency of emission systems. It is also designed to provide superior engine cleanliness, wear protection and strong durability to keep your engine running like new. Significant fuel savings are achieved by using the ultra-low viscosity 0 W-20 grade. This product is developed for mandatory use in the latest 2.0 TFSI 140 kW and 3.0 TDI CR 160 kW, VW and Audi engines.

VW 508 00 a 509 00,
ACEA C5,
API SN Plus,
PORSCHE – C20,
VW – 508.00/509.00,
VW TL 52 577

1 L	33.365	8591522333650
4 L	33.367	8591522333674

0W-30 MILLENIUM SYNTH STOP-START

Full synthetic engine oil for both diesel and petrol engines complying with Euro 6 standard, specially developed for STOP-START system

CARLSON® MILL. SYNTH STOP-START 0W-30

This product is developed for mandatory use in the latest EURO 6 TDCI Duratorq Ford engines. This product is also applicable to other passenger car engines that require 0 W-30 viscosity grade and ACEA C2 performance, providing a multi-vehicle oil application. Optimal formulation for today's automotive engines with exceptional fuel economy and extended service intervals.

ACEA C2,
FIAT 9.55535-DS1,
FIAT 9.55535-GS1,
FORD WSS -M2C950-A,
HONDA,
JAGUAR
LAND ROVER,
STJLR 03.5007,
JEEP,
MITSUBISHI,
SUBARU,
SUZUKI,
TOYOTA

1 L	33.366	8591522333667
4 L	33.368	8591522333681

5W-30 MILLENIUM SYNTH LONGLIFE III

High-performance all-season 100% synthetic engine oil for engines with extended drain intervals

CARLSON® MILL. SYNTH LONGLIFE III 5W-30

It is a fully synthetic lubricant. It is specifically designed for downsized turbocharged gasoline engines with direct injection (TGDI) to mitigate LSPI (Low Speed Pre Ignition).

ACEA C2, ACEA C3,
API – SN Plus,
API – SP,
BMW – LONGLIFE-04,
FIAT 9.55535-S3,
MB 229.31,
MB – 229.51,
MB – 229.52,
OPEL OV0401547,
PORSCHE – C30,
VW 503.01,
VW – 504.00/507. 00

1 L	33.520	8591522335203
4 L	33.521	8591522335210
5 L	33.694	8591522336941
10 L	33.085	8591522340856
60 L	33.272	8591522332721
200 L	33.273	8591522332738

5W-30 MILLENIUM SYNTH FORD

High-performance all-season 100% synthetic engine oil specifically designed for Ford engines

CARLSON® MILLENIUM SYNTH FORD 5W-30

A modern synthetic engine oil designed primarily for Ford vehicles, based on a unique „Complex Protection Formula" formula that guarantees optimum engine protection in all operating conditions. It guarantees: minimization of engine wear due to reduced friction, protection of internal engine parts against corrosion, effective heat dissipation from the engine, fuel economy, fast start at low temperatures, excellent protection against sludge and deposit formation, extended service life. CARLSON MILLENIUM SYNTH FORD 5 W-30 is designed for passenger cars and light commercial vehicles equipped with gasoline engines with catalytic converters and highly turbocharged and non-turbocharged diesel engines equipped with DPF or TWC filters. Meets Ford specification WSS-M2C913-D. Recommended for Euro 6 compliant vehicles.

API SL/CF,
ACEA A1/B1,
A5/B5, SAE 5 W-30,
Ford WSS-M2C913-C,
Ford WSS-M2C913-D,
Renault RN 0700,
Jaguar JTJLR 03.5003

1 L	33.522	8591522335227
4 L	33.523	8591522335234

5W-40 MILLENIUM SYNTH

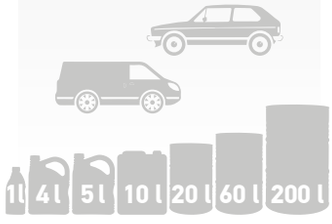
High quality all-season 100% synthetic engine oil

CARLSON® MILLENIUM SYNTH 5W-40

This oil is used in gasoline engines of cars that meet the highest performance requirements and diesel engines of passenger cars with turbocharging and direct fuel injection.

1 L	33.518	8591522335180
4 L	33.519	8591522335197
5 L	33.656	8591522336569
10 L	33.553	8591522335531
20 L	34.169	8591522341693
60 L	33.132	8591522331328
200 L	34.170	8591522341709

ACEA A3/B3-16,
ACEA A3/B4, API – SN,
API CF,
BMW LONGLIFE-01,
FIAT 9.55535-H2,
FIAT 9.55535-M2,
FIAT 9.55535-Z2,
MB 226.5, MB 229.3,
OPEL GM -LL -A-025,
OPEL GM -LL -B-025,
PORSCHE – A40,
PSA – B71 2296,
RENAULT RN 0700,
RENAULT RN 0710,
VW – 502.00,
VW – 505. 00



5W-40 MILLENIUM SYNTH PD

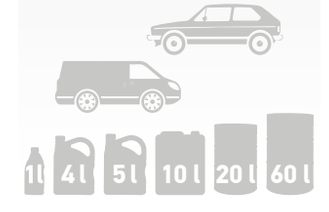
High quality all-season 100% synthetic engine oil designed especially for Volkswagen AG PD pump-nozzle engines

CARLSON® MILLENIUM SYNTH PD 5W-40

It is a fully synthetic lubricant based on carefully selected high quality base oils. It is formulated with superior additives to meet the demanding requirements of VW specification 505.01 in terms of resistance to oxidation, oil thickening and sludge formation in the engine. It is a Mid SAPS (Sulfated Ash, Phosphorus and Sulphur content) oil that meets Euro 4 and Euro 5 standards. It provides reliable protection for aftertreatment equipment and particulate filters. It is specifically recommended for lubrication of all TDI engines with pump injectors and for common rail turbodiesel engines.

1 L	33.524	8591522335241
4 L	33.525	8591522335258
5 L	33.695	8591522336958
10 L	34.086	8591522340863
20 L	34.168	8591522341686
60 L	33.197	8591522331977

ACEA: C3-16,
API: SN/CF,
BMW: LONGLIFE-04,
FIAT: 9.55535-GH2,
FIAT: 9.55535-S2,
FORD: WSS-M2C917-A,
GM: dexos2™,
MB: 226,5,
MB: 229,31,
PORSCHE: A40,
RENAULT: RN 0700,
RENAULT: RN 0710,
VW: Approval 505 00,
VW: Approval 505 01



10W-40 MILLENIUM SEMI

High quality all-season semi-synthetic engine oil

CARLSON® MILLENIUM SEMI 10W-40

It is a semi-synthetic lubricant. It is recommended especially for diesel engines with direct injection - Common Rail, HDI, CDI, etc. It can be used all year round - thanks to its optimal viscosity index.

ACEA A3/B3-16,
ACEA A3/B4,
API SN/CF,
FIAT 9.55535-D2,
FIAT 9.55535-G2,
MB – 229.1,
RENAULT RN 0700,
RENAULT RN 0710,
VW 501.01,
VW 505.00

1 L	33.516	8591522335166
4 L	33.517	8591522335173
10 L	33.552	8591522335524
20 L	34.171	8591522341716
60 L	33.128	8591522331281
200 L	33.172	8591522331724

30 EXTRA M6A

High quality single stage engine oil especially for older engines

CARLSON® 30 EXTRA M6A

It is a summer engine oil made from petroleum base oil and additives to improve the antioxidant properties and reduce the freezing point.It is intended for lubrication of undemanding older types of spark-ignition and diesel engines operating in moderate operating conditions.

SAE 30,
API SB/CB

1 L	33.097	8591522330970
4 L	33.046	8591522330468

30 EXTRA M6AD

High quality single stage engine oil especially for older engines

CARLSON® 30 EXTRA M6AD

Mineral summer engine oil made from petroleum base oil and additives to improve antioxidant, detergent and dispersion properties. It is primarily intended for lubrication of older types of spark-ignition and non-turbocharged diesel engines operating under light duty conditions.

SAE 30,
API SB/CB

1 L	33.526	8591522335265
4 L	33.527	8591522335272
5 L	33.696	8591522336965
10 L	33.104	8591522331045
60 L	33.105	8591522331052

1l 4l 5l 10l 60l

15W-40 SUPER GX

High quality all-season mineral engine oil

CARLSON® SUPER GX 15W-40

It is an all-season engine oil designed primarily for highly turbocharged diesel engines with the highest heat loads. It is also suitable for the particularly demanding operating conditions of conventional passenger cars equipped with four-stroke petrol or diesel engines. This oil ensures low engine wear and good starting conditions in winter. It contains a mixture of highly refined petroleum fractions (base oil) and refining additives.

API SG/CF-4

1 L	33.514	8591522335142
4 L	33.515	8591522335159
5 L	33.691	8591522336910

1l 4l 5l

15W-40 EXTRA M7ADS III

High quality all-season mineral engine oil for turbocharged and non-turbocharged diesel engines

CARLSON® 15W-40 EXTRA M7ADS III

This is a high performance all-season engine oil. It has excellent antioxidant properties guaranteeing long oil life, protects internal engine parts against corrosion, prevents the formation of high temperature deposits and low temperature sludge and keeps the engine clean. CARLSON® EXTRA M7ADSIII+ 15 W-40 is designed for year--round lubrication of stressed turbocharged and non-supercharged diesel engines with the highest heat loads. It is also suitable for the particularly demanding operating conditions of conventional passenger cars equipped with four-stroke gasoline and diesel engines.

SAE 15 W-40,
API SG/CF-4

1 L	33.148	8591522331489
4 L	33.149	8591522331496
10 L	33.150	8591522331502
20 L	33.173	8591522331731
60 L	33.151	8591522331519
200 L	33.174	8591522331748

15W-50 EXTRA M8AD

High-quality all-season engine oil for petrol and turbocharged diesel engines

CARLSON® EXTRA M8AD 15W-50

M8AD automotive engine oil is a petroleum oil containing additives to improve detergent-dispersant, anti-wear, anti-corrosion, anti-oxidant and viscosity properties.

SAE 15 W-50
API SE/CC

1 L	33.111	8591522331113
4 L	33.112	8591522331120
10 L	33.113	8591522331137

5W-30 LOW SAPS DIESEL TRUCK

Top quality UHPD engine oil

CARLSON® 5W-30 LOW SAPS DIESEL TRUCK

The highest quality UHPD engine oil based on a synthetic base oil and an advanced Low SAPS additive package. Guarantees engine protection confirmed by a series of tests, reduced fuel consumption, compatibility with exhaust gas treatment equipment. Use: Carlson SAE 5 W-30 is designed for use in modern truck engines equipped with advanced exhaust gas treatment systems such as Exhaust Gas Recirculation (EGR) and Diesel Particulate Filter (DPF). It achieves maximum powertrain protection, which has been proven in a wide range of tests, and extends the trouble-free operation of advanced exhaust gas treatment systems used in Euro VI, Euro V and EPA Tier 4 compliant vehicles.

10 L	34.176	8591522341761
20 L	34.175	8591522341754
60 L	33.681	8591522336811
200 L	33.682	8591522336828

ACEA E4, E6, E7, E9; API CJ-4 / SN, SAE 5 W-30, MB-Approval 228.51, VOLVO VDS-4, MACK EO-O PREMIUM PLUS, RENAULT VI RLD-3, MAN M3477, MAN M3677, Meet Scania LA specification CUMMINS CES 20081; DAIMLER MB228.31, Detroit Diesel Extranet 93K218; DEUTZ DQC IV-10 LA; MTU TYPE 3.1, VOLVO VDS-3, Scania LDF-4, MAN M3691, M3271-1, Caterpillar EFC-3

Mid SAPS 10W-30

New generation semi-synthetic Mid SAPS engine oil type UHPD

CARLSON® MID SAPS 10W-30

Newly developed cutting-edge technology based on high quality base oils and additives ensuring reduced sulphur, sulphate ash and phosphorus content. Ensures superior engine performance under all operating conditions, extended filter life and oil change intervals, engine cleanliness by keeping contaminants in suspension, improved fuel economy / maximum fuel savings, maximum engine performance under extreme conditions, safe operation of catalytic converters in engine exhaust systems. Use: CARLSON Mid SAPS 10 W-30 is the engine oil recommended for low emission engines equipped with exhaust aftertreatment systems such as DPF, EGR/SCR. It can be used in vehicles meeting EPA Tier 4, Tier 3, EU Stage IIIA, IIIB and IV standards.

20 L	33.806	8591522338068
60 L	34.000	8591522340009
200 L	34.001	8591522340016

ACEA E9, API CK-4/CJ-4, SAE 10W-30
Approval Volvo VDS-4.5, Renault RVI RLD-3, Mack EO-O-S 4.5, Deutz DQC III-10 LA, MTU Type 2.1, MB-Approval 228.31
This product meets Cummins® Eng. Std. 20086
Meets requirements: MAN M3775, M3575, Caterpillar ECF-3, Detroit Diesel DFS 93K222, Ford WSS-M2C171-F1

10W-40 LOW SAPS DIESEL TRUCK

Synthetic oil designed to lubricate extremely stressed modern diesel engines

CARLSON® 10W-40 LOW SAPS DIESEL TRUCK

Synthetic oil designed for lubrication of extremely stressed modern diesel engines requiring „Low SAPS“ oils. The unique „low SAPS“ formulation ensures low sulphur, phosphorus and sulphated ash content. The oil has excellent antioxidant, detergent, dispersant and anti-corrosive properties. The synthetic oil is designed to lubricate modern diesel engines requiring „Low SAPS“ oils. It is suitable for engines equipped with EGR, SCR and diesel particulate filter. The oil is suitable for Euro IV and Euro V engines. Allows for extended oil change intervals. It also meets EPA Tier I and II with respect to NOx and PM (particulate matter). The oil can also be successfully used in older diesel engines meeting Euro IV, Euro III, Euro II, Euro I emission limits.

10 L	34.178	8591522341785
20 L	34.177	8591522341778
60 L	33.683	8591522336835
200 L	33.684	8591522336842

SAE 10 W-40,
API CI-4,
ACEA E7/E6
Meets requirements:
MAN M3477, MAN M 3271-1, MB 228.51,
VOLVO VDS-3, RENAULT RLD-2/RXD, MACK EO--N RLD-2/RXD
MTU Type 3.1, DEUTZ DQC-III-10 LA (performance),
DAF HP 2

15W-40 DIESEL TRUCK PLUS E9

Modern engine oil for heavy-duty diesel engines

CARLSON® 15W-40 DIESEL TRUCK PLUS E9

The oil is based on state-of-the-art base oils and additives with reduced sulphated ash, phosphorus and sulphur content. It has excellent antioxidant, detergent, dispersant and anti-corrosion properties. It is suitable for large capacity diesel engines meeting EURO IV, EURO V and EURO VI emission limits. Use:It is a year-round engine oil designed to work in the most heavily loaded diesel engines with and without turbocharging, especially in large trucks, construction machinery and buses, but is also suitable for light commercial and passenger cars. It is suitable for engines equipped with SCR or EGR exhaust gas treatment equipment, and is particularly suitable for engines equipped with DPFs. Ideal mineral oil for mixed fleets meeting EURO IV and EURO V emission limits.

20 L	34.004	8591522340047
60 L	34.003	8591522340030
200 L	34.005	8591522340054

SAE 15 W-40, API CJ-4/SM, ACEA E9/E7
Meets requirements:
MAN M3575,
MTU Type 2.1,
Cummins CES 20081,
Caterpillar ECF-1a/ECF-3,
Detroit Diesel 93K218,
Renault VI RLD-3,
MB – Approval 228.31,
VOLVO VDS-4,
Mack EO-O Premium plus

10W-40 DIESEL TRUCK

Semi-synthetic oil for heavy-duty diesel and petrol engines

CARLSON® DIESEL TRUCK 10W-40

It is a modern semi-synthetic engine oil for heavy duty diesel and petrol engines. It guarantees perfect engine protection against wear, engine cleanliness throughout the whole operation thanks to reduced soot formation, reduced fuel and oil consumption, environmental protection. Use: SHPD engine oil is designed to work in the most heavily loaded diesel and gasoline engines with and without turbocharging, especially in large trucks, construction machinery and buses, but is also suitable for light commercial and passenger cars. It is the ideal oil for mixed fleets meeting EURO IV and EURO V emission limits.

1 L	33.554	8591522335548
4 L	33.555	8591522335555
10 L	33.144	8591522331441
20 L	34.179	8591522331793
60 L	34.146	8591522341464
200 L	33.147	8591522331472

SAE 10 W-40,
API CI-4/SL, ACEA E7/B4/A3

Meets the requirements:
VW 505.00,
MB 228.3, 229.1,
MAN M3275,
VOLVO VDS-3,
RENAULT RLD-2,
MTU Type 2,
SCANIA LD
MACK EOM-Plus

15W-40 DIESEL TRUCK

Mineral oil for heavy duty diesel and petrol engines

CARLSON® DIESEL TRUCK 15W-40

It is a modern mineral oil for heavy duty diesel and petrol engines. It guarantees perfect engine protection against wear, engine cleanliness throughout the whole operation thanks to reduced soot formation, reduced fuel and oil consumption, environmental protection. Use: SHPD engine oil is designed to work in the most heavily loaded diesel and gasoline engines with and without turbocharging, especially in large trucks, construction machinery and buses, but is also suitable for light commercial and passenger cars. It is the ideal mineral oil for mixed fleets meeting EURO IV and EURO V emission limits.

1 L	33.556	8591522335562
4 L	33.557	8591522335579
10 L	33.143	8591522331434
20 L	34.180	8591522341808
60 L	33.158	8591522331588
200 L	34.181	8591522341815

SAE 15 W-40,
API CI-4/SL,
ACEA E7/B4/A3,

Meets the requirements:
VW 505.00,
MB 228.3, 229.1,
MAN M3275,
VOLVO VDS-3,
RENAULT RLD-2,
MTU Type 2,
SCANIA LD,
MACK EOM-Plus,
CAT-ECF-1-a

GARDEN 2T

High quality semi-synthetic engine oil for lubricating two-stroke engines, lawn mowers, snowmobiles and motorcycles

CARLSON® GARDEN 2 T

High quality semi-synthetic oil for two-stroke engines, well miscible with fuel, which guarantees high protection against carbon deposits and very low smoke. Provides excellent lubrication protection against wear even at high speeds and temperatures. The semi-synthetic oil is designed for two-stroke engines and can be used for both self-mixing and separate lubrication. It is intended for: automobiles and motorcycles with two-stroke engines, chain and circular saw engines, brushcutter engines, and all types of gardening tools equipped with two-stroke engines.Recommended dosage: 2% in the fuel mixture (1:50), unless the engine manufacturer recommends a different dilution.

API: TC

100 ML	33.281	8591522332813
1L	33.279	8591522332790

100 ml

GARDEN 4T 10 W-30

High-quality engine oil for lubricating four-stroke engines of lawn mowers and garden equipment

CARLSON® GARDEN 4 T 10 W-30

High quality seasonal mineral oil for use in small agricultural and garden machinery equipped with four-stroke engines. The quality of the oil is guaranteed by a well-chosen production technology based on deeply refined mineral base oils and carefully selected refining additives. The oil has excellent utility properties: it maintains a permanent lubricating film under conditions of high thermal and mechanical load due to low resistance, it guarantees minimum oil consumption, it has very good antioxidant properties preventing the formation of black sludge, prevents corrosion and prevents the formation of high temperature deposits, it is fully miscible with other oils of the same viscosity and performance class. Use: seasonal (SAE 30) or year-round (SAE 10 W-30) mineral engine oil for lubrication of small agricultural and garden equipment equipped with four-stroke engines (e.g. mowers, garden tractors, cultivators, ploughs, cutters…).

SAE 30,
10 W-30,
API SG/CD

1 L	33.278	8591522332783

40 EXTRA M2T

Quality engine oil for lubricating two-stroke engines

API TA, SAE 40

CARLSON® 40 EXTRA M2T

A two-stroke general purpose engine oil made from highly refined mineral base oils and additives that prevent oxidation, corrosion, wear and deposits. Use: two-stroke gasoline engines of passenger cars and motorcycles of older construction lubricated with a mixture of oil and gasoline or by direct injection Two-stroke gasoline engines of passenger cars and motorcycles of older construction lubricated with a mixture of oil and gasoline or by direct injection. Perfectly miscible with fuel, keeps the system clean. contains special additives.

100 ML	33.216	8591522332165
250 ML	33.217	8591522332172
500 ML	33.218	8591522332189
1L	33.095	8591522330956

100 ml 250 ml 500 ml 1l

LOSS LUBRICATION CHAIN AND CHAINSAW BLADES

A blend of mineral base oils and conditioning additives designed for loss lubrication of stressed saw blades and chains

ISO VG 32, 46, 100 a 150

CARLSON® STATE MEASUREMENT

Loss lubrication oils are based on deeply refined dewaxed base oils. They have reasonable oxidation stability. Loss lubrication oils are intended for the lubrication of lightly to moderately loaded working parts of machines and industrial equipment such as:

- rolling and plain bearings
- guide surfaces
- mechanical gears
- spindles
- auxiliary friction nodes
- pins, joints, pressure surfaces
- chains and blades of power saws
- saw blades of caters

1L	33.289	8591522332899

GARDEN BIO - CHAINSAW BLADES AND BLADES

High quality biodegradable oil for lubricating chain and chainsaw blades

CARLSON® GARDEN BIO

All-season eco-friendly oil with excellent performance properties for lubricating chainsaw blades, based on deeply refined vegetable oil and a special combination of refining additives. The composition of the oil allows it to be classified as biodegradable - 81.6% in the OECD 301 F test. It guarantees very good adhesion to the moving parts of the saw's cutting gear, excellent lubrication properties at low temperatures, optimal temperature characteristics allowing use over a wide temperature range, protection against corrosion and abrasive wear. PILAROL EKO is intended for lubrication of chains and blades of chainsaws used in forestry and horticulture. It can also be used to lubricate other equipment used in forestry harvesting.

Biodegradability: 81,6 % by test OECD 301 F

1 L	33.280	8591522332806

GARDEN CLEAVING MACHINES

Hydraulic oil for wood chippers, small agricultural and construction machinery, transport and industry

CARLSON® GARDEN CLEAVING MACHINES

Hydraulic oil for wood chippers is a high quality hydraulic oil based on special hydrotreated base oils and advanced zinc-reduced refining additives for extended oil life, high system protection against wear and corrosion. Thanks to its superior composition, its viscosity values are very stable even at widely varying temperatures. The oil is suitable not only as a filling for all hydraulic splitters, but also for other modern hydrostatic mechanisms subjected to high mechanical and thermal loads.

DIN 51 524 part 2 – HLP, ISO 11 158 – HM 46

1 L	33.299	8591522332998

STOU 10W-30

Super Tractor Oil Universal semi-synthetic oil

CARLSON® STOU 10W-30

A high performance oil based on modern base oils that meets the recommendations of all major agricultural tractor manufacturers. Its viscosity guarantees fast lubrication of all aggregates. The stable lubricant layer protects safely against abrasion even at high temperatures. It is used equally in the engines, transmissions and hydraulic systems of modern tractors. It is also suitable for liquid brakes and clutches (PTO clutches).

10 L	34.006	8591522340061
20 L	34.007	8591522340078
60 L	34.008	8591522340085
200 L	34.009	8591522340092

ACEA E2-96#5 / E3-96#3
API CG-4 / CF-4 / CF / CE / CD / SF / GL-4
Specifications:
ZF TE-ML 03 A, 05 K, 06 B, 06C, 07 B, 07D,
Massey Fergusson M1145, M1144, M1139,
Ford M2C159 B/C
New Holland NH030C, 82009201,
John Deere J27
Specifications hydraulika:
Sperry Vickers/Eaton M29505,
I-280-S
Sauer/Sunstrand/Danfos:
Hydrostatic Trans Fluid

STOU 10W-40

Super Tractor Oil Universal semi-synthetic oil

CARLSON® STOU 10W-40

It is a quality semi-synthetic oil of the Super Tractor Oil Universal type. It is characterized by a high level of engine protection during work in the harshest conditions. Thanks to a properly selected formulation, it perfectly lubricates any manual transmission, Powershift and CVT. Use: CARLSON STOU 10 W-40 is a universal oil that is suitable for use in engines, manual transmissions, Powershift, CVT. It can also be used in hydraulic systems and for wet brakes.

10 L	34.010	8591522340108
20 L	34.011	8591522340115
60 L	34.012	8591522340122
200 L	34.013	8591522340139

API CG-4, API GL-4, SAE 10 W-40
Meets the requirements:
Massey Ferguson M1145, Massey Ferguson M1144, NH024C, Ford M2C 159B3, Ford M2C 159C3, John Deere J27, New Holland 82009203, Ford M2C134D, Case MS1205, Case MS1206, Case MS 1209, Allison C4, Caterpillar TO-2, ZF 06 B, ZF 06C, ZF 07 B, ZF 03 A, ZF05K ZF 07D, MB 227.1, MB 228.1, CCMS D4, Sperry Vickers/Eaton: M2950S, Sperry Vickers/Eaton: I-280-S, Sauer Sunstrand/Danfoss: Hydro Static Trans Fluid AFNOR NFE68603E

UTTO 10W-30

High quality multipurpose gear oil - hydraulic oil

CARLSON® UTTO 10W-30

High quality multi-purpose gear - hydraulic oil. Unique modern composition of specially selected bases and refining additives allows to meet the current requirements of manufacturers of agricultural equipment. The oil provides excellent corrosion and wear protection and is compatible with common sealing materials. It is intended for lubrication of various types of gearboxes used in agricultural machinery (main gearboxes, steering gears, gearboxes) and highly loaded hydraulic systems, following the recommendations of agricultural machinery manufacturers. It can also be used in tractors where manual transmissions, axles, hydraulic systems and wet brakes are lubricated with a common oil fill.

10 L	34.014	8591522340146
20 L	34.015	8591522340153
60 L	34.016	8591522340160
200 L	34.017	8591522340177

SAE 10 W-30, API GL-4
Meets the requirements:
Ford M2C 134D,
Case New Holland MAT 3525,
MAT 3526,
John Deere JDM J20C,
Massey Ferguson CMS M1143, 1135, 1145,
Volvo WB101,
JCMAS HK P-041,
P-042, Parker (Dennison UTTO) HF -1,
HF -2, Sauer Sunstandard/Danfoss,
Eaton: M2950S, I-280-S

TDTO 10W

Semi-synthetic multi-purpose oil type PTF (Power Transmission Fluid) TDTO (Transmission and Drive Train Oil)

CARLSON®T DTO 10W

Semi-synthetic multi-purpose oil meets the stringent requirements of Caterpillar TO-4. It features excellent anti-friction properties, minimizes gear wear, provides quieter brake operation, has very good compatibility with seal materials and very good oxidation stability. The high viscosity index ensures very good viscosity-temperature characteristics. Thanks to the use of specially selected base oils and improvers, it provides extended life of gearboxes and brakes. Use: CARLSON TDTO 10 W is designed for heavy-duty use in transmissions, Powershift transmissions and hydraulic systems of heavy construction equipment, tractors and loaders of American-made trucks.

10 L	34.018	8591522340184
20 L	34.019	8591522340191
60 L	34.020	8591522340207
200 L	34.021	8591522340214

SAE 10 W
Meets the requirements:
Komatsu Dresser HMS
B21-0006
Komatsu Micro-Clutch
Caterpillar TO-4
Alison C-4

INFORMATION ON GEAR OILS

VISCOSITY CLASSIFICATION

SAE Specifications (Society of Automotive Engineers, USA) are used to evaluate the viscosity properties of gear oils. This standard is used to classify oils into 4 winter classes, denoted by a number and a „W", and 5 summer classes, denoted by a number.

SUMMER CLASSES

80
85
90
140
250

WINTER CLASSES

70 W
75 W
80 W
85 W

If only one grade is used in the designation, it is a monograde oil (summer or winter). If a combination of summer and winter grades is used (e.g. 80 W-90), it is a multigrade or all-season oil. More often, unlike engine oils, monograde gear oils are required by manufacturers.

Note: In general, the higher the SAE grade number of the two groups, the more viscous the oil.

HOW TO CHOOSE THE RIGHT GEAR OIL?

When selecting gear oil, similar principles apply as when selecting engine oil.

1. The first rule of thumb when choosing a gear oil is to follow the car manufacturer's instructions in each vehicle's manual. Only the transmission (vehicle) manufacturer can responsibly tell you which oil to use. Virtually no manufacturer recommends a particular brand of oil (contrary to competition laws in the European Union). Transmission (car) manufacturers recommend oils according to so-called Performance Specifications, e.g. API GL-4, API GL-5, VW TL 726 Y and SAE Viscosity Specifications, e.g. 75 W, 80 W-90.

2. API GL-4 oils are almost exclusively used for synchromesh gearboxes and API GL-5 oils for hypoid gearboxes. Do not use API GL-5 oils in place of API GL-4 oils and vice versa, you may damage synchromesh or hypoid gears.

3. Replacement intervals are then specified for the oils so recommended. Passenger car manual transmissions usually use lifetime fillings.

4. If you do not have the vehicle handbook, ask the vehicle manufacturer (at the Czech importer's headquarters). Remember, the vehicle manufacturer does not recommend the brand of oil, only the performance and viscosity specifications.

VISCOSITY CLASSES OF TRANSFER OILS ACCORDING TO SAE J306A

SAE grade	Max. temperature for dynamic viscosity 150 Pas, s (°C)	Kinematic viscosity at 100 °C	
		mm (mm²/s)	max (mm²/s)
70 W	–55	4,1	
75 W	-40	4,1	
SOW	-26	7,0	
85 W	–	11,0	
80	–	7,0	< 11
85	–	11,0	< 13,S
90	–	13,5	<24
140	–	24,0	< 41
250	–	41,0	–

HOW TO CHOOSE POWER STEERING FLUID

There are several main types of liquids:

Mineral. These include refinery oil fractions and additives that improve the oil's performance. The main advantage of mineral fluids, apart from price, is that they do not have an aggressive effect on rubber elements. However, they have a short service life and are prone to increased foaming.

Semi-synthetic. Their composition contains both mineral and synthetic substances. They have the advantage of lower viscosity, resistance to foaming and good lubricity. However, semi-synthetic fluids have a destructive effect on the rubber elements of power steering.

Synthetic. Their composition contains mainly polyunsaturated alcohols, polyesters and small amounts of mainly refined petroleum fractions. In order to reduce the destructive effect on the rubber seals, special additives are mixed into the synthetic oil mixture. Synthetic fluids are more expensive but have excellent performance characteristics: resistance to foaming, low viscosity, ability to operate at extreme temperatures and the longest service life. Power steering fluid usually contains information on the packaging about the standards it meets and the make of vehicle it can be used on.

Hydraulic fluids differ not only in composition and functional properties, but also in colour. The most common are as follows:

Red. They are manufactured to General Motors automotive group standards and are known as Dexron. They are manufactured by the Group and by third parties under licence. These fluids are used in Toyota, Nissan, Hyundai, Kia, Mazda and General Motors vehicles. **Yellow.** They are primarily intended for Mercedes-Benz vehicles. They are developed by Daimler but are also produced by other manufacturers under licence. **Green.** They are manufactured by the German company Pentosin. They are actively used in Volkswagen, Ford, Bentley, BMW, Volvo and Daimler AG Group cars.

However, it is a mistake to choose power steering oil only by colour. A colour match does not always mean the same composition. For example, Dexron fluids can be either mineral or synthetic, even if they are the same colour. It is strictly forbidden to mix mineral, synthetic and semi-synthetic fluids with each other.

PERFORMANCE CLASSIFICATION

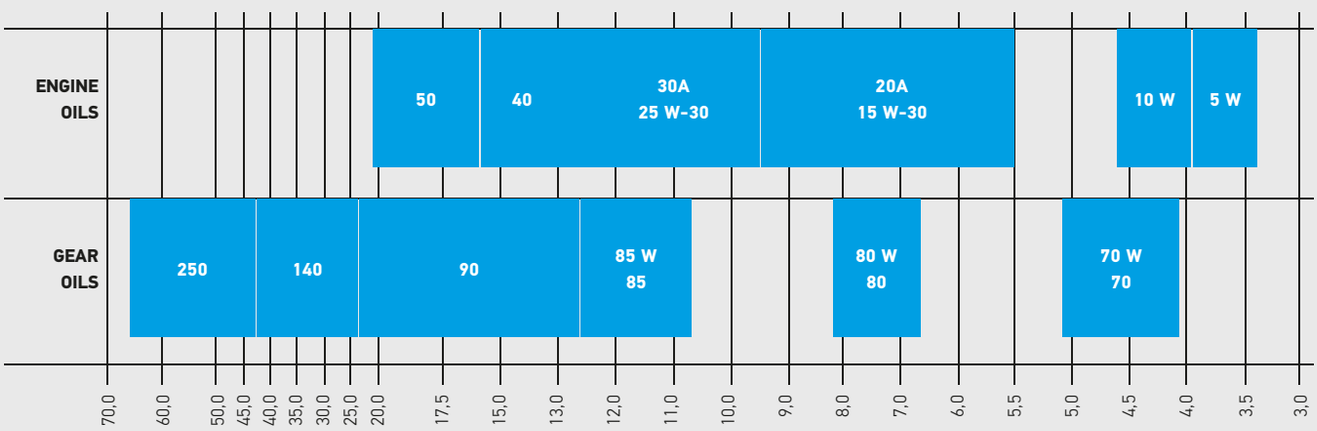
The API (American Petroleum Institute, USA) classification is used to mark the performance category of gear oils. The performance grade designation consists of the letters „GL“ (Gear Lubricant) and a number indicating the performance grade.

the following performance classes are currently used:
GL-3 nlow additive oils for medium duty manual gearboxes.
GL-4 high additive oils designed primarily for manual shift gearboxes and lightly loaded hypoid gears.
GL-5 oils designed for highly loaded hypoid gears operating under the most severe operating conditions, subject to variable shock loads.
GL-6 oils for hypoid gears operating under extreme conditions. So far they are very rarely used.
MT-1 oils for manual and non-synchronised truck transmissions under high operating loads.

API GL-5 and GL-6 oils, although higher performance grade than API GL-4, are not suitable for use in manual shift transmissions, as synchronisation and damage to the gearbox may occur.

As with engine oils, there are standards for individual gearbox manufacturers, but they are applied almost exclusively in specifying the requirements for automatic gearbox oils (Voith, ZF, GM, Ford, Allison…).

COMPARISON OF VISCOSITY CLASSIFICATIONS OF SAE DRIVING AND MOTOR OILS



PP 80W GEAR

High-quality multigrade all-season gear oil

CARLSON® PP 80W GEAR

A mineral automotive gear oil that has very good lubricating, anti-corrosion and anti-oxidation properties, high transfer resistance and good resistance to foaming. It is intended for use in mechanical transmissions and gearboxes (except hypoid) of automobiles, mobile equipment and agricultural equipment operating at low ambient temperatures. It is also intended for use in a variety of machinery and equipment where the manufacturer recommends the use of API GL-4 grade oil.

SAE 80 W,
API GL-4

1 L	33.133	8591522331335
10 L	33.135	8591522331359
60 L	33.136	8591522331366

1l 10 l 60 l

PP 90 GEAR

High-quality all-season gear oil

CARLSON® PP 90 GEAR

A mineral automotive gear oil that has very good lubricating, anti-corrosion and anti-oxidation properties, high transfer resistance and good resistance to foaming. It is intended for year-round use in mechanical transmissions and gearboxes (except hypoid) of automobiles, mobile equipment and agricultural machinery. It is often applied at elevated temperatures, where it guarantees reliable operation of gearboxes. It is also used in industrial applications (e.g. stressed industrial gearboxes operating at normal or elevated temperatures). It is also intended for use in a variety of machinery and equipment where the manufacturer recommends the use of API GL-4 grade oil.

SAE 90,
API GL-4

1 L	33.138	8591522331380
5 L	33.139	8591522331397
10 L	33.140	8591522331403
60 L	33.141	8591522331410

1l 5l 10 l 60 l

PP 80W-90 GEAR

High quality mineral gear oil

CARLSON® PP 80W-90 GEAR

A mineral automotive gear oil that has very good lubricating, anti-corrosion and anti-oxidation properties, high transfer resistance and good resistance to foaming. It is intended for use in mechanical transmissions and gearboxes (except hypoid) of automobiles, mobile equipment and agricultural machinery operating at low ambient temperatures. It is also intended for use in a variety of machinery and equipment where the manufacturer recommends the use of API GL-4 grade oil.

SAE 80 W-90,
API GL-4

1 L	34.022	8591522340221
5 L	34.023	8591522340238
10 L	34.024	8591522340245
20 L	34.027	8591522340276
60 L	34.025	8591522340252
200 L	34.026	8591522340269

PP 80W-90H GEAR

High quality mineral gear oil

CARLSON® PP 80W-90H GEAR

A mineral automotive gear oil that has very good lubricating, anti-corrosion and anti--oxidation properties, high transfer resistance and good resistance to foaming. It is intended for use in mechanical transmissions and gearboxes (especially hypoid) of automobiles, mobile equipment and agricultural machinery operating under severe operating conditions, i.e. high speed and low torque or low speed and high torque. It is also intended for use in a variety of machinery and equipment where the manufacturer recommends the use of API GL-5 grade oil.

SAE 80 W-90,
API GL-5

1 L	33.558	8591522335586
10 L	33.559	8591522335593
60 L	33.560	8591522335609

PP 75W-90 GEAR SYNTH

High quality multigrade all-season 100% synthetic gear oil

CARLSON® PP 75 W-90 GEAR SYNTH

High-grade synthetic automotive gear oil with a balanced additive package to increase lubricating film load capacity. It has excellent lubrication and antioxidant properties, high resistance to heavy loads while providing very good corrosion protection. It is intended for year-round lubrication of gearboxes and transmissions, especially in hypoid cars and trucks, buses and earth moving machines operating in heavy duty conditions.

SAE 75 W-90,
API GL-4/GL-5,
ZF TE-ML 01/05/07

1 L	33.153	8591522331533
20 L	34.182	8591522341822
60 L	34.194	8591522341945

1l 20 l 60 l

PP 75W-80 GEAR SYNTH

High quality synthetic automotive gear oil

CARLSON® PP 75W-80 GEAR SYNTH

High quality synthetic automotive gear oil. The use of state-of-the-art Extreme Pressure additives ensures the ability to withstand high loads. The highest quality synthetic base oil ensures that excellent lubrication properties are maintained throughout operation. Guarantees stable lubrication properties throughout operation, high load transfer resistance, excellent lubricity and anti-friction properties, ability to withstand high loads. PLATINUM GEAR SW 75 W-80 is designed for use in mechanical transmissions and gearboxes of cars, trucks, buses and heavy construction machinery.

API GL-4,
SAE 75 W-80,

Meets the requirements:
Mercedes-Benz 235.5,
ZF TE-ML 01, 02, 08,
MAN 341 Z2,
DAF,
Iveco,
Eaton

1 L	34.048	8591522340481
5 L	34.050	8591522340504
20 L	34.052	8591522340528
60 L	34.049	8591522340498
200 L	34.051	8591522340511

1l 5 l 20 l 60 l 200 l

PP 80W-90 LS GEAR

New generation multigrade gear oil

CARLSON® PP 80W-90 LS GEAR

A new generation multigrade gear oil, designed on the basis of mineral base oils and a package of high quality enriching additives. It provides optimum lubrication and maximum protection for manual transmissions, but also for Limited Slip - LS gearboxes. It is a high quality multi-speed gear oil designed for use in mechanical transmissions of cars, trucks and buses operating in difficult conditions where an API GL-5 compliant oil is required. Suitable for use in heavily stressed vehicles and on construction sites as well as other mechanical or motorized equipment equipped with self-locking differential, so-called LS - Limited Slip.

SAE 80 W-90,
API GL-5

5 L	34.028	8591522340283
10 L	34.029	8591522340290
20 L	34.030	8591522340306
60 L	34.031	8591522340313
200 L	34.032	8591522340320

5 l | 10 l | 20 l | 60 l | 200 l

PP 80W-90 LL GEAR

Mineral, gear oil with extended drain interval

CARLSON® PP 80W-90 LL GEAR

Mineral, multigrade, high quality gear oil with extended drain interval. Designed for use in manual transmissions and drive axles of motor vehicles. The perfect choice of additive package ensures excellent drive operation, easy shifting and high oil stability. Use: Excellent gear oil for year-round use in cars, vans, trucks and other commercial motor vehicles operated in extremely difficult conditions, i.e. high surge loads and high speeds, as well as high temperatures. Recommended for manual, synchronized and non-synchronized transmissions and drive axles of motor vehicles.

SAE 80 W-90, API GL-5/
GL-4/MT-1

Meets the requirements:
ZF TE-ML TE-ML 02 B,
05 A, 12L, 12M, 16 B,
17H, 19 B, 21 A,
MAN 342 Typ M2,
MAN 341 Typ Z2,
MIL-PRF-2105E,
Mercedes-Benz 235.0,
SCANIA STO 1:0,
RENAULT, MACK GO-J,
ZF TE-ML 07 A, 08,
ArvinMeritor, DAF,
IVECO

5 L	34.033	8591522340337
10 L	34.034	8591522340344
20 L	34.035	8591522340351
60 L	34.036	8591522340368
200 L	34.037	8591522340375

5 l | 10 l | 20 l | 60 l | 200 l

PP 85W-140 GEAR

Mineral automotive gear oil

CARLSON® PP 85W-140 GEAR

Mineral automotive gear oil with very good lubricating, antioxidant, anti-corrosive properties. It has good resistance to foaming. Use: CARLSON GEAR PP 85 W-140 is intended for use in mechanical transmissions and gearboxes of cars, trucks, buses, construction and agricultural equipment operating in harsh environments where the manufacturer recommends the use of API GL-5 grade oil.

API GL-5,
SAE 85 W-140

5 L	34.038	8591522340382
10 L	34.039	8591522340399
20 L	34.040	8591522340405
60 L	34.041	8591522340412
200 L	34.042	8591522340429

5 l | 10 l | 20 l | 60 l | 200 l

PP 85W-90 GEAR

Mineral automotive gear oil

CARLSON® PP 85W-90 GEAR

It is a mineral automotive gear oil. It has very good lubrication, anti-corrosion and anti-oxidation properties, high resistance to pressure transmission and good resistance to foaming. CARLSON GEAR PP 85 W/90 gear oil is primarily intended for lubrication of transmissions and gearboxes of mobile equipment operating in severe operating conditions such as: high speed low torque, low speed high torque, machinery and equipment where the manufacturer's recommended oil is GL-5 grade according to API.

API GL-5, SAE 85 W-90

Meets the requirements:
MAN 342 Type M1,
Mercedes Benz 235.0,
MIL-L-2105D,
RENAULT,
Voith 3.325-339,
Volvo 97310,
Volvo 97316,
ZF TE-ML 05 A, 07 A,
16 B, 16C, 16D, 17 B,
19 B, 21 A, DAF

5 L	34.043	8591522340436
10 L	34.044	8591522340443
20 L	34.045	8591522340450
60 L	34.046	8591522340467
200 L	34.047	8591522340474

5 l | 10 l | 20 l | 60 l | 200 l

ATF DEX IID

Oil for automatic transmissions and power steering

CARLSON® ATF DEX IID

ATF II D mineral oil is for use in automatic transmissions of cars, trucks and buses where the manufacturer recommends the use of Dexron® II D. ATF II D is also suitable for use in power steering, hydraulic clutches of cars and trucks and hydraulic systems where ATF type oil is required.

MAN 339 Typ Z1,
MAN 339 Typ V1,
ZF TE-ML 04D,
11 A, 14 A,
Voith H55.6335xx
(G 607),
GM Dexron® II D
Allison C-4

1 L	33.154	8591522331540
10 L	33.199	8591522331991

ATF DEX III H AUTOMATIC TRANSMISSIONS AND BOOSTERS

Gear oil for automatic transmissions and power steering

CARLSON® ATF DEX III H

A semi-synthetic automatic transmission oil with a package of additives to improve lubrication, anti-foaming, anti-corrosion and anti-oxidation properties. CARLSON ATF DEX III is designed for use in automatic transmissions of cars, trucks and buses where the manufacturer recommends the use of Dexron III. It is also suitable for use in power steering, car and truck hydraulic clutches and hydraulic systems requiring the use of ATF oil. It can be used in tractor and Powershift loader transmissions where the equipment manufacturer recommends the use of ATF oil.

Dexron III H,
IIIG, Voith H55.6335.xx,
ZF TE-ML 03D,
ZF TE-ML 04D,
ZF TE-ML 14 A,
ZF TE-ML 17C,
Volvo 97341 (Volvo Std
1273.41),
Volvo 97340 (Volvo Std
1273.40),
MAN 339 typ Z1,
MAN 339 typ V1,
Allison C4,
Ford Mercon,
Mercedes-Benz 236.9

1 L	33.362	8591522333629
10 L	33.363	8591522333636

CONTROL BOOSTERS

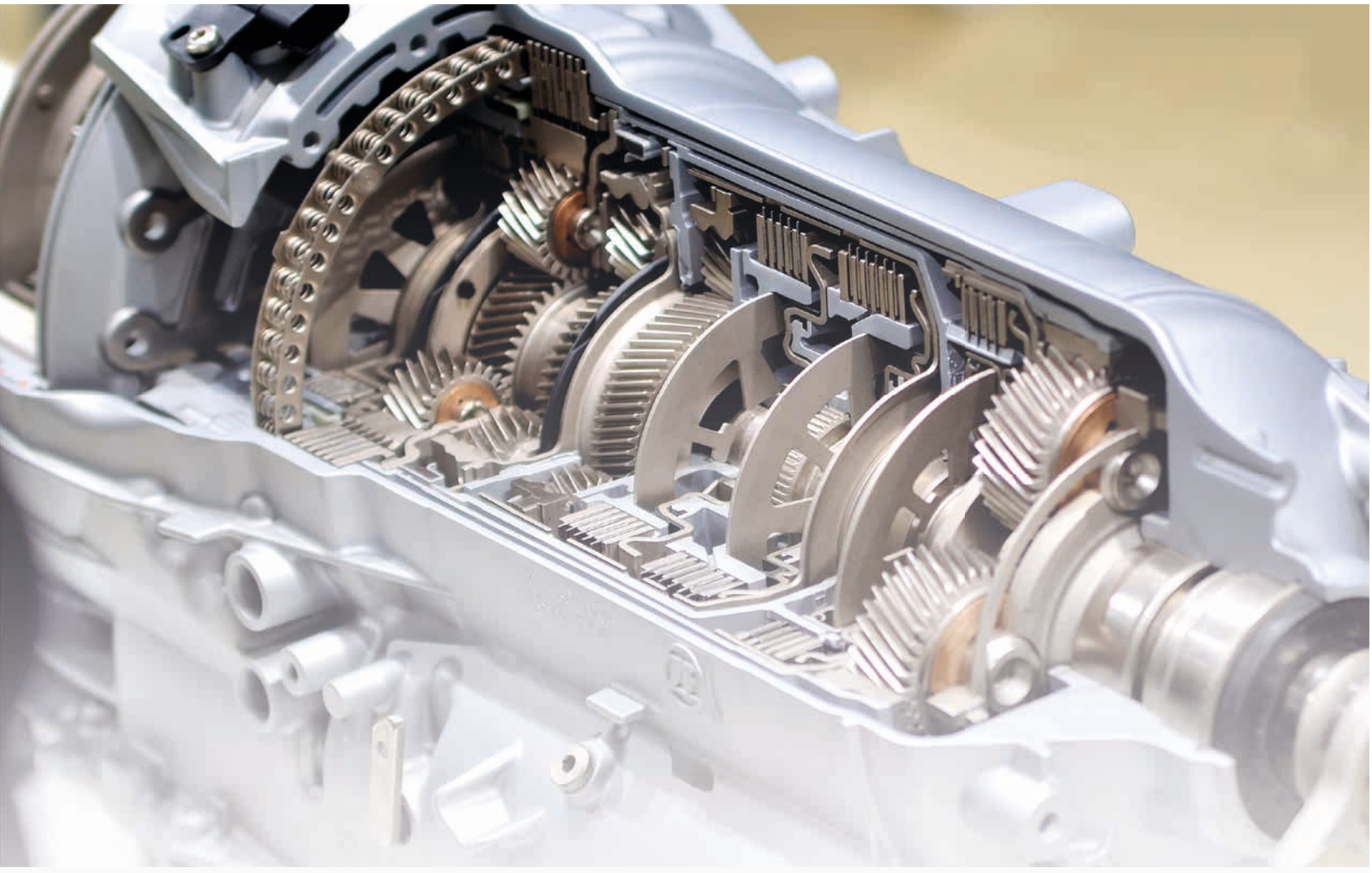
Multi-purpose hydraulic oil for Skoda/VW power steering and other vehicle brands

CARLSON® POWER STEERING

Multi-purpose hydraulic oil for Skoda/VW power steering and other vehicle brands, according to vehicle manufacturer's specifications. Oil for power steering and central hydraulic systems of cars and trucks. The oil is based on synthetic and mineral oils with ash-free additives, has excellent thermal stability, protects against wear and provides reliable protection against corrosion. The low pour point allows the oil to be used even in winter at extremely low temperatures.

VW TL 521 46 (G002 000, G004 000 M2), MB 343.0, MB 344.0, MB 345.0, CHF11S, CHF202, Opel 1940 715, Opel 1940 766, Ford M2C204-A2, Ford 1 384 110, ZF TE-ML 02 K, SAAB 93160548, BMW 83 29 0 429 576, Citroen 9979 A1, Land Rover Cold Climate PAS Fluid 14315 LRN2261, Hyundai/Kia PSF-4 03100-00130, VOLVO 30741424, Toyota PSF NEW-W, Toyota 08886-01115

1 L	33.364	8591522333643



INFORMATION ON INDUSTRIAL OILS

CLASSIFICATION OF INDUSTRIAL LUBRICANTS

Under the collective name „industrial oils“ we understand a large group of lubricating oils that are widely used for lubrication of machinery and equipment operated in industry, energy, mining, construction, agriculture, etc. Industrial oils are divided into several main groups, the names of which are based on the characteristics and use of these oils.We distinguish between machine (bearing), turbine, compressor, gear, hydraulic, cylindrical, dark, sliding line and other oils.Industrial lubricants are classified according to viscosity classes and performance standards. ISO VG viscosity grades indicate the mean viscosity value in mm^2/s at 40 °C. This viscosity is usually included in the oil designation and is usually a number at the end of the oil's trade name. This number is usually preceded by a written code that characterises the performance of the oil. The first letter usually indicates the classification of the oil according to its main use according to ISO 6743 or DIN 51502, and the next letters usually indicate the oil must have additives or specify the type of use.

INDUSTRIAL GEAR OILS

DIN 51 517

Part 1, C – non-additive oils
Part 2, CL – oils with anti-oxidation and corrosion additives
Part 3, CLP – oils with anti-wear additives (L-corrosion and anti--oxidation properties, P-anti-wear properties)

ISO 3448 – VISCOSITY CLASSES OF INDUSTRIAL LUBRICANTS

Viscosity class at 40 °C in mm^2/s	Medium oil viscosity in mm^2/s	Viscosity range at 40 °C
ISO VG 2	2,2	1,98–242
ISO VG 3	3,2	2,88–3,52
ISO VG 5	46	414–5,06
ISO VG 7	68	612–748
ISO VG 10	10	9,0–11,0
ISO VG 15	15	13,5–16,5
ISO VG 22	22	19,8–24,2
ISO VG 32	32	788–352
ISO VG 46	46	A506
ISO VG 68	68	61,2–74,8
ISO VG 100	100	90–110
ISO VG 150	150	135–165
ISO VG 220	220	198–242
ISO VG 320	320	288–352
ISO VG 460	460	414–506
ISO VG 680	680	612–748
ISO VG 1000	1000	900–1100
ISO VG 1500	1500	1350–1650

ISO 6743, DIN 51502 – PERFORMANCE CLASSES OF INDUSTRIAL LUBRICANTS

	ISO 6743	DIN 5 1 502
open lubrication systems common oils	A	AN, B
mould oil separators	B	FS
circulating system gears	C	C, HYP
compressors	D	V, K
internal combustion engines	E	HD
spindles, bearings and associated couplings	F	C
sliding guides	G	CG
hydraulic systems	H	H, HV, HF, ATF
Metalworking	M	S, W
electrical insulation	N	J
pneumatic machines, oil mist lubrication	P	D
heat transfer media	Q	Q
corrosion protection	R	R
turbines	T	TD
heat treatment	U	L
other applications	Y	F
steam engines	Z	Z

HYDRAULIC OILS (HYDRAULIC FLUIDS)

ISO 6743/4 H	DIN 5 1 524
HH - unadditivated oil	
HL - HH oil with anti-corrosion and anti-oxidation additives	Part 1, HL - oil with anti-corrosion and anti-oxidation additives
HM - HL oil with anti-abrasion additive	Part 2, HLP - HM oil according to ISO 6743/4
HV - HM oil with viscosity index increasing additive	Part 3, HVLP - HV oil according to ISO 6743/4

(**H** – hydraulic fluid, **L** - anti-corrosion and anti-oxidation properties, **P** - anti-abrasion properties, **V** - reduced temperature dependence of viscosity, **D** - additional letter indicating improved detergent properties)

HM 32, HM 46, HM 68 HYDRAULIC

High-quality hydraulic oil for high-stress hydrostatic mechanisms

CARLSON® HM 32, HM 46, HM 68 HYDRAULIC

Hydraulic oils are designed to transmit power in hydrostatic systems and to drive hydraulic equipment, i.e. in hydraulic gears, control and regulating mechanisms and other equipment operating under severe operating conditions (pressures up to 25, MPA in gear pumps and up to 35, MPA in piston pumps), elevated temperature and humidity environments.

HM 22 – for systems operating at very low temperatures (winter operation)

HM 32 – for systems operating at low temperatures (winter or year-round operation)

HM 46 – hydraulics in normal conditions (year-round operation)

HM 68 – systems operating at high temperatures (summer operation)

DIN 51 524 part 2 – HLP
ISO 11 158 – HM

HM 32		
10 L	33.707	8591522337078
20 L	34.096	8591522340962
60 L	34.097	8591522340979
200 L	33.702	8591522337023

HM 46		
1 L	33.212	8591522332127
10 L	33.195	8591522331953
60 L	33.161	8591522331618
200 L	33.167	8591522331670

HM 68		
10 L	34.098	8591522340986
20 L	34.099	8591522340993
60 L	34.100	8591522341006
200 L	34.101	8591522341013

HV 32, HV 46, HV 68 HYDRAULIC

Hydraulic oils HV - oils with improved viscosity-temperature properties

CARLSON® HV 32, HV 46, HV 68 HYDRAULIC

HV hydraulic oils are manufactured from high grade petroleum base oils and a package of refining additives. They are characterized by high wear resistance and improved viscosity-temperature properties compared to HM grade hydraulic oils. They guarantee: extended service life, reduced wear of friction surfaces of hydraulic systems, functionality in a wide range of temperatures while maintaining optimal viscosity properties (VI>140) Application: HV hydraulic oils are intended for use in highly loaded control systems, in high-pressure piston pumps with constant and variable power operating at pressures around 35, MPA and speeds of 2500 n/min, in vane pumps (pressures up to 20, MPA) where a high level of anti-friction properties of the oil is required, in precision hydraulic control systems and in hydraulic systems that require minimal changes in oil viscosity depending on temperature.

DIN 51 524 Part 3 –
HVLP ISO 6743/4 – HV

HV 32		
10 L	34.073	8591522340733
20 L	34.074	8591522340740
60 L	34.075	8591522340757
200 L	34.076	8591522340764

HV 46		
10 L	34.078	8591522340788
20 L	34.079	8591522340795
60 L	34.080	8591522340801
200 L	34.081	8591522340818

HV 68		
10 L	34.088	8591522340887
20 L	34.089	8591522340894
60 L	34.090	8591522340900
200 L	34.091	8591522340917

HV 46 ZF HYDRAULIC

Hydraulic oils type HVI - without zinc content

CARLSON® HV 46 ZF HYDRAULIC

Hydraulic oils of HVI type, obtained on the basis of refined mineral oils and a package of zinc-free enriching additives. These oils are characterized by: high level of functional properties, excellent viscosity and temperature characteristics (viscosity index 150), which allow the use of the oil in hydraulic systems operated under variable temperature conditions, high thermal and hydrolytic stability, high resistance to oxidation, high load capacity (FZG test station, breaking degree > 12), very good anti-wear properties, very good filterability, high resistance to foaming, compatibility with seals. Application: the high durability of hydraulic oils allows their use in highly loaded power transmission systems as well as in hydraulic drive and control systems operating in extremely difficult conditions.

DIN 51 524 Part 3 – HVLP, ISO 11158 – HV

10 L	34.082	8591522340825
20 L	34.083	8591522340832
60 L	34.084	8591522340849
200 L	34.087	8591522340870

OTHP 3 HYDRAULIC

High quality multi-purpose all-season hydraulic oil

CARLSON® OTHP 3

A special hydraulic petroleum oil treated with a complex of active additives (antioxidant, corrosion inhibitor, friction modifier, etc.) to meet the specific requirements of hydrodynamic systems. Application: hydraulic oil OTHP 3 is intended as a working fluid for selected types of hydrodynamic couplings, converters and gearboxes for trucks, buses, construction machinery, forklifts, etc. In industrial applications it can also be used as a performance class HM hydraulic fluid.

ISO VG 32, GMC type C2
ISO 6743/4 – HM

1 L	33.287	8591522332875
10 L	33.196	8591522331960
60 L	33.162	8591522331625
200 L	33.168	8591522331687

HEES 46 HYDRAULIC

Biodegradable hydraulic oil

CARLSON® HEES 46 HYDRAULIC

High quality, easily biodegradable hydraulic oil. It is made from a blend of synthetic esters. Enriching additives containing functionally similar active ingredients as conventional hydraulic oils Specifications HM or HV, ensure their high oxidation stability, excellent lubricating properties, excellent corrosion and rust protection properties. Very good low temperature properties, low viscosity dependence on temperature and very good surface properties are also characteristic. Excellent biodegradability - under CEC-L-33-T-82 test conditions, more than 96% of the oil degrades after 21 days. Water hazard rating WGK=0. It is mainly intended for highly loaded high-pressure hydrostatic mechanisms, equipped with hydrogenerators with high requirements for the oil antifriction effect (vane, axial and radial piston) and for its thermo-oxidation stability. It is particularly suitable for mobile hydraulics working all year round in unprotected environments, especially if, for example, in the event of a system failure, there is a risk of environmental contamination by leaked oil (most often, mechanisms of agricultural, forestry and construction machinery and equipment working in protected landscape areas, hydraulic arms of removal rigs, forestry removal rigs, construction machinery, drilling rigs, hydroelectric power plants, etc.). It is able to operate in a wide range of temperatures (from -30 °C to +100 °C). It complies with the biodegradability requirements of the "Forest Law" No. 289/95 and related regulations.

ISO VG 46,
DIN 51524 part 2 and 3,
ISO 15380 HEES,
VDMA 24568 – HEES

10 L	34.092	8591522340924
20 L	34.093	8591522340931
60 L	34.094	8591522340948
200 L	34.095	8591522340955

10 l 20 l 60 l 200 l

OL-J 22, OL-J 32, OL-J 46, OL-J 100, OL-J 150

L-AN machine oil is designed for lubrication of industrial equipment

CARLSON® OL-J 22, 32, 46, 100, 150

L-AN machine oils are intended for the lubrication of lightly to moderately loaded working parts of machinery and industrial equipment such as: rolling and plain bearings, guide surfaces, mechanical gears, spindles, auxiliary friction nodes. Some L-AN machine oils are also used for other purposes, such as filling light-duty hydraulic systems, etc.L-AN machine oils can be supplied in viscosity grades ISO VG 22,32,46,68,100 and 150.

OL-22		
10 L	33.706	8591522337061
20 L	34.121	8591522341211
60 L	34.122	8591522341228
200 L	34.123	8591522341235

CLP 100, CLP 150, CLP 220, CLP 320, CLP 460

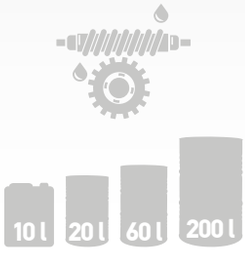
Industrial gear oil

CARLSON® CLP 100, 150, 220, 320, 460

The deeply refined base oils, on the basis of which these oils are mainly formulated, are produced by a special hydrogenation technique. They contain effective additives to increase oxidation stability, to improve high-pressure properties, rust protection, etc. They are intended in particular for lubrication of all types of through-gear transmissions, especially stressed transmissions with high gear pressures; they are suitable for both rolling gears (spur and bevel gears) and worm gears (worm gears, etc.). They are also used to lubricate bearings and other moving machine parts, particularly where excellent high-pressure oil properties are required. They are also advantageous for use in circulating lubrication systems, especially where excellent lubrication properties and excellent chemical stability of the oil are required. CARLSON CLP series oils can be used for a number of applications where automotive gear oils or durable compressor oils, etc., have been used as a fallback.

Characteristic properties: excellent protection of lubricated gears, etc. excellent high-pressure properties, very good corrosion protection (steel and non-ferrous metals), guarantees protection of ferrous materials against rusting, excellent oxidation resistance guarantees long service life, very good de-emulsification properties allow use even in cases where water penetrates the system to a limited extent, favourable viscosity-temperature dependence.

ISO VG 100, SO 6743/3 CKC, ISO 12925-1 CKC/CKD, DIN 51 517 part 3 CLP, AGMA 9005-E2, U.S. Stell 224
ISO VG 150, SO 6743/3 CKC, ISO 12925-1 CKC/CKD, DIN 51 517 part 3 CLP, AGMA 9005-E2, U.S. Stell 224, ISO VG 220, SO 6743/3 CKC, ISO 12925-1 CKC/CKD, DIN 51 517 part 3 CLP, AGMA 9005-E2, U.S. Stell 224, ISO VG 320, ISO 6743/3 CKC, ISO 12925-1 CKC/CKD, DIN 51 517 part 3 CLP, AGMA 9005-E2, U.S. Stell 224, ISO VG 460, SO 6743/3 CKC, ISO 12925-1 CKC/CKD, DIN 51 517 part 3 CLP, AGMA 9005-E2, U.S. Stell 224



CLP 100

10 L	34.053	8591522340535
20 L	34.054	8591522340542
60 L	34.055	8591522340559
200 L	34.056	8591522340566

CLP 150

10 L	34.057	8591522340573
20 L	34.058	8591522340580
60 L	34.059	8591522340597
200 L	34.060	8591522340603

CLP 220

10 L	34.061	8591522340610
20 L	34.062	8591522340627
60 L	34.063	8591522340634
200 L	34.064	8591522340641

CLP 320

10 L	34.065	8591522340658
20 L	34.066	8591522340665
60 L	34.067	8591522340672
200 L	34.068	8591522340689

CLP 460

10 L	34.069	8591522340696
20 L	34.070	8591522340702
60 L	34.071	8591522340719
200 L	34.072	8591522340726

KV 32, KV 46, KV 68, KV 100, KV 220

Slide line oils

CARLSON® KV 32, KV 46, KV 68, KV 100, KV 220

Slide rail oils are used to lubricate all types of slide rails. Slide rail oils are available in ISO viscosity grades VG 32, 46, 68, 100, 150 and 220.Slide rail oils 32, 46 and 68 - are mainly used for lubricating horizontal guide elements operating at lower temperature and lower medium load.Slide rail oils 220 - are mainly used for lubricating vertical or precision guide elements operating at higher temperature and high load. The oils guarantee reliable function of the sliding guides, have a favourable frictional characteristic and prevent stick-slip.

Other uses:

- lubrication of horizontal and vertical sliding guides of machine tools and production systems
- lubrication of other places on machines such as gearboxes, sliding bearings, etc.
- as a multifunctional circulating oil for sliding guides, hydraulics and gears
- medium-duty forming operations

ISO VG 46, Cincinnati Machine, P-47 and P-50,ISO 6743, ISO--L-G, DIN 51 502: CGLP
ISO VG 68, Cincinnati Machine, P-47 and P-50,ISO 6743, ISO--L-G, DIN 51 502: CGLP
ISO VG 100,Cincinnati Machine, P-47 and P-50, ISO 6743, ISO-L-G, DIN 51 502: CGLP
ISO VG 220, Cincinnati Machine, P-47and P-50, ISO 6743, ISO-L-G, DIN 51 502: CGLP

KV 32		
10 L	34.103	8591522341037
20 L	34.104	8591522341044
60 L	34.105	8591522341051
200 L	34.106	8591522341068

KV 46		
10 L	34.107	8591522341075
20 L	34.108	8591522341082
60 L	34.109	8591522341099
200 L	34.110	8591522341105

KV 68		
10 L	33.189	8591522331892
20 L	34.111	8591522341112
60 L	33.705	8591522337054
200 L	34.112	8591522341129

KV 100		
10 L	34.113	8591522341136
20 L	34.114	8591522341143
60 L	34.115	8591522341150
200 L	34.116	8591522341167

KV 220		
10 L	34.117	8591522341174
20 L	34.118	8591522341181
60 L	34.119	8591522341198
200 L	34.120	8591522341204

VDL 46 VDL 68, VDL 100

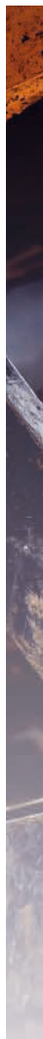
High quality oil for use in reciprocating, screw and vane compressors

CARLSON® VDL 46 VDL 68, VDL 100

CARLSON VDL series compressor oils are based on a deeply refined mineral base oil and a package of refining additives to improve the oil's operating properties. The oils are characterized by: very good anti-corrosion properties and prevent rapid wear, good resistance to oxidation, good air separation and low foaming. CARLSON VDL compressor oils are designed for lubrication of highly loaded air and gas compressors. CARLSON VDL 46 and CARLSON VDL 68 - oils used for lubrication of rotary (mostly screw) compressors with higher loads (outlet temperature > 100 °C), they are also suitable for turbo compressors. CARLSON VDL 100 - oil for high-load reciprocating air and gas compressors (with discharge temperatures from 160 to 220 °C), especially in cases where lower performance oils are no longer suitable - e.g. due to deposit formation, carbon build-up, etc.

ISO VG 46, 68, 100
ISO 6743-3: L-DAA,
L-DAB, DIN 51506 VDL

VDL 46		
1 L	34.134	8591522341341
10 L	34.135	8591522341358
20 L	33.724	8591522337245
60 L	34.136	8591522341365
200 L	34.137	8591522341372
VDL 68		
1 L	34.138	8591522341389
10 L	34.139	8591522341396
20 L	33.709	8591522337092
60 L	34.140	8591522341402
200 L	34.141	8591522341419
VDL 100		
1 L	33.190	8591522331908
10 L	34.130	8591522341303
20 L	34.131	8591522341310
60 L	34.132	8591522341327
200 L	34.133	8591522341334



VACUUM R2

Lubrication of two-stage rotary pumps

CARLSON® VACUUM R2

Pump oil produced from high quality mineral oil by distillation under conditions
It is characterized by: good lubricity, chemical and thermal stability, low evaporation rate, resistance to sludge and sediment formation.Application.
The product is used for rotary vacuum pumps of two-stage rotary pumps.

ISO VG 100

1 L	34.164	8591522341648
5 L	33.723	8591522347237
10 L	34.165	8591522341655
20 L	33.722	8591522337221
60 L	34.166	8591522341662
200 L	34.167	8591522341679

CUT 32

CUT 32 – multifunctional cutting oil

CARLSON® CUT 32

CUT 32 can be used as a multifunctional additive, suitable for machining operations performed on automatic machine tools as well as for lubricating their gears. They are designed for chip machining operations with a precisely definable tool cutting edge geometry (turning, milling, drilling, material cutting, threading and reaming; they can also handle internal broaching operations, but only in material with good broachability). The properties of CARLSON CUT cutting oil can also be used in operations carried out with tools where the cutting edge geometry is not precisely defined (thread and gear grinding). Characteristic properties: their properties create an optimal cutting environment with excellent anti-corrosive effect, their EP properties keep the tool in the engagement for as long as possible without the need for grinding and thus clearly contribute to prolonging the life of the tool.

ISO VG 32,
ISO 6743 ISO - L - MHF
ISO VG 46,
ISO 6743 ISO - L - MHF

10 L	33.725	8591522337252
20 L	33.727	8591522337276
60 L	33.726	8591522337269
200 L	33.728	8591522337283

CUT 3

Cutting oil

CARLSON® CUT 3

CARLSON CUT 3 is a cutting oil that contains additives to improve cutting and lubrication performance and protect machines, tools and workpieces from corrosion. CARLSON CUT 3 is designed for finishing operations of grinding, superfinishing, honing and lapping of all metallic materials. It is also suitable for machining light metal alloys with tools with precisely defined cutting edge geometry such as turning, milling, drilling, material cutting, threading and reaming. Due to its lubrication capabilities, it is also designed for lubrication of high-speed spindles with sliding bearing (grinders, lathes, etc.).

ISO VG 5

10 L	34.124	8591522341242
20 L	33.708	8591522337085
60 L	34.125	8591522341259
200 L	33.711	8591522337115

RARE EMULSION

Emulsifying oil for metalworking

CARLSON® RARE EMULSION

Metalworking emulsifying oil is based on highly refined mineral oil, ionic and non-ionic emulsifiers, corrosion inhibitors and other refining agents. The oil is free of nitrites, chlorine, heavy metals and phenols. The oil is used in the form of a water emulsion as a cooling and lubricating fluid for machining steel, cast iron and non-ferrous metals and their alloys, recommended working concentrations of the emulsion (with water hardness 15°N) depending on the type of machining and the material to be machined: grinding 3 – 5 %, turning, milling, drilling, boring 5 – 10 %, thread cutting 10 – 15 %.

10 L	34.126	8591522341266
20 L	34.127	8591522341273
60 L	34.128	8591522341280
200 L	34.129	8591522341297

PNEUMAT 22, 32, 46, 100

Mineral oil for pneumatic machines

CARLSON® PNEUMAT 22, 32, 46, 100

Highly refined ISO VG 22 mineral oil for pneumatic machines, tools, equipment and mechanisms. It contains additives that improve antioxidant properties, lower the pour point and increase the viscosity index. It protects lubricated parts against wear, prevents corrosion, does not act aggressively on seals, has high resistance to shear stress and very good filterability. It separates air very well and thus minimises foam formation. It is also suitable for hydraulic equipment.

ISO VG 22; DIN 51 502 D; ISO 6743-L-P
ISO VG 32; DIN 51 502 D; ISO 6743-L-P
ISO VG 46; DIN 51 502 D; ISO 6743-L-P
ISO VG 100; DIN 51 502 D; ISO 6743-L-P

VG 22		
1 L	34.142	8591522341426
5 L	34.143	8591522341433
10 L	34.144	8591522341440
20 L	34.145	8591522341457
60 L	34.146	8591522341464
200 L	34.147	8591522341471

VG 32		
5 L	34.148	8591522341488
10 L	34.149	8591522341495
20 L	34.150	8591522341501
60 L	34.151	8591522341518
200 L	34.152	8591522341525

VG 46		
1 L	34.153	8591522341532
5 L	34.154	8591522341549
10 L	34.155	8591522341556
20 L	34.156	8591522341563
60 L	34.157	8591522341570
200 L	34.158	8591522341587

VG 100		
5 L	34.159	8591522341594
10 L	34.160	8591522341600
20 L	34.161	8591522341617
60 L	34.162	8591522341624
200 L	34.163	8591522341631

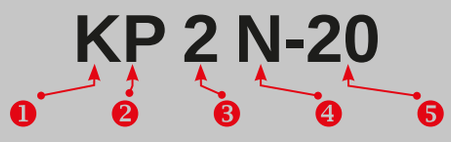
INFORMATION ON PLASTIC LUBRICANTS

HOW TO GET TO KNOW GREASES

Greases are used where oil cannot be used because it would run off. Their purpose is to stay in place and form a protective layer on stressed components. Everyone agrees that lubrication is necessary.

But what to choose?
The label on the packaging will tell you what the lubricant is. They are most often described according to DIN and ISO standards. Individual machine manufacturers also have their own standards. If a machine operator decides to choose according to the recommendations of his own, he will not make a mistake.

According to DIN 51 502, lubricants are identified by a code with five elements. We will illustrate their designation with an example according to DIN 51 502:



1 The first letter (or two letters) indicates the type of lubricant application.

- **K** – for rolling and plain bearings and sliding surfaces
- **M** – for plain bearings and seals (lower requirements than K)
- **G** – for closed gears
- **OG** – for open gears

2 The second letter (or two letters) indicates the type of base oil and additives. However, it is not always stated.

- **E** – ester oil
- **FK** – fluorocarbons
- **HC** – synthetic hydrocarbons
- **PG** – polyglycols
- **PH** – phosphate esters
- **SI** – silicone oil
- **X** – others
- **F** – solid additives (e.g. molybdensulphide, graphite)
- **P** – high-pressure (EP) or antiwear (AW) additives to protect against galling of sliding metal surfaces under high pressures

3 The number indicates the consistency of the lubricant

CONSISTENCY GRADES	CONSISTENCY
00	semi-liquid
0	very soft
1	soft
2	semi-soft
3	medium
4	semi-fluid
5	dense
6	very dense
7	stiff

4 The fourth letter indicates the maximum operating temperature and water resistance.

TAGGED	MAXIMUM WATER EMPERATURE AT 40 °C	LUBRICANT CHANGE WHEN EXPOSED TO WATER AT 80 °C	LUBRICANT CHANGE ON EXPOSURE
C	60 °C	none to slight	
D	60 °C	moderate to strong	
E	80 °C	none to slight	
F	80 °C	moderate to strong	
G	100 °C		none to slight
H	100 °C		average to strong
K	120 °C		none to slight
M	120 °C		average to strong
N	140 °C	Water resistance not specified	
P	160 °C		
R	180 °C		
S	200 °C		
T	220 °C		
U	above 220 °C		

5 The last number indicates the minimum operating temperature

From the designation of **Nils Atomic KP 2 N-20**, we can therefore see that it is a lubricant for bearings and sliding surfaces, which is based on high-pressure or antifriction additives. It has a semi-soft consistency and can be used at operating temperatures from – 20 to 140 °C.

Another option for designation is ISO 6743/9. We will show this on a grease marked ISO-L-X-CDHB 2.ISO-L-X shows the system, class and type of marking. The characters that follow tell the properties of the lubricant.

ISO-L-X-CDHB 2

1 2 3 4 5

1 Letter indicating minimum operating temperature

TAGGED	MIN. OPERATING TEMPERATURE
A	0 °C
B	–20 °C
C	–30 °C
D	–40 °C
E	less than –40 °C

2 The next letter shows the maximum operating temperature

TAGGED	MIN. OPERATING TEMPERATURE
A	60 °C
B	90 °C
C	120 °C
D	140 °C
E	160 °C
F	180 °C
G	more than 180 °C

3 Letter indicating water and rust resistance

A Not water resistant, does not protect against rust
B Not water resistant, protects against rust in the presence of distilled water
C Not waterproof, rustproof in the presence of salt water
D Resistant to static moisture, does not protect against rust
E Resistant to static moisture, protects against rust in the presence of distilled water
F Resistant to static moisture, protects against rust in the presence of salt water
G Resistant to washing with water, does not protect against rust
H Water-wash resistant, rust-proof in the presence of distilled water
I Water-wash resistant, rust-proof in the presence of salt water

4 The last letter indicates high-pressure properties

A It does not have improved high-pressure properties
B It has enhanced high pressure (EP) properties that protect against seizure of sliding metal surfaces at high pressures

5 The number at the end shows the NLGI consistency

(International Society of Oils and Lubricants) on a scale of 000 - 6, with 000 being the greatest fluidity and 6 the greatest stiffness
Grafit Greases is therefore designed for operating temperatures from -30 to 140 °C according to the **ISO-L-X-CDHB 2** designation. It resists water washout, so it can withstand rain and protects against rust. At high pressures, it has an increased protective ability against seizing of sliding metal surfaces and has a medium-stiff consistency.

LUBRICANT COMPOSITION

Greases consist of three components. A base oil (or rarely another liquid lubricant), a thickener (usually a soap) and an additive to improve operating properties.Lubricants are often divided according to the type of thickener, but division by base oil is also possible. Sometimes greases also contain a component called solid lubricants. Of these, graphite and molybdenum disulfide, or molybdenum sulfide, are the most popular.

For excavator pins, sulfur is better than graphite. Sulphide, i.e. molybdenum sulphide, contains sulphide S2, which binds to iron. However, the sulphide composition does not guarantee that the oil does not also contain graphite. This is used by manufacturers as a substitute for the more expensive molybdenum sulphide. However, this combination is not a bad thing either, because there is a good synergistic effect between this element and the compound. However, the machinist will not be able to tell which of these components the lubricant contains from the DIN and ISO markings. He usually finds this information in the product's description of the composition.He must also rely on the description to determine the added thickener. According to the thickener, lubricants can be divided into seven basic categories. All of them can be used on construction machinery, and the manufacturers of each brand can usually advise on the correct choice. The machinist should also take into account the warm environment in which he is working and how often he comes into contact with water.

Calcium greases have the advantage of being perfectly waterproof. But it's even harder to react to high temperatures. Once they get above 70°C, they run off. They are suitable for machines with central lubrication and long lines. At higher pressures, they strip the oil.

Sodium greases already have a higher pour point, between 150 and 230 °C. They will melt when they exceed it, but will regain their original consistency when they cool down. They emulsify with less water, but are washed away with more. The disadvantage of some sodium lubricants is so-called gelation, where the lubricant ages and changes consistency to something like rubber due to temperatures and other influences. Another disadvantage is that the lubricant, which is not directly involved in the lubrication process, enters the circulation through the rotating parts of the bearing. This breaks the sealing ability of the bearing and contaminants enter the bearing from the outside.

Lithium greases have a pour point of around 190 °C and are completely water resistant. Some types, however, emulsify with air and lose their viscosity and sealing ability.Clay greases are also water resistant. They start to flow at 90 °C but have excellent adhesion and are very ductile. Complex calcium greases have the advantages of both calcium and sodium greases. Their pour point is over 200 °C and they are waterproof. This

makes them multi-purpose.Gel greases contain an inorganic hardener instead of soap. Silica gel and bentonite lubricants, which have no pour point and are used up to 130 °C, but up to 200 °C in the short term, are particularly practical for lubrication.Synthetic greases often contain soap as a hardener, with the liquid part consisting of synthetic oil. Of the lubricants, they have the largest temperature range for use. However, they are expensive, so they are not used much.The importance of viscosity is whether the lubricant is fluid enough to reach all the necessary places, but not so much that it runs off the machine. There are nine degrees of lubricant consistency. Lubricants are rated 00 for liquid, 0 for very soft, 1 for soft, and with each successive number the stiffness increases to a rating of 7 for solid lubricants. We can also encounter markings that start at grade 000 and end at grade 6. However, the markings more or less correspond.

FAT COMPATIBILITY

Stiffener	Ca Soap	Ca_x Soap	Li Soap	Li_x Soap	Li/Ca Soap	Na Soap	Bentonit	Ba_x Soap	Al_x Soap	Polyurea
Ca Soap	✔	✔	✔	✔	✔	✖	✔	✔	✖	✔
Ca_x Soap	✔	✔	✔	✔	✔	✖	✔	✔	✖	✔
Li Soap	✔	✔	✔	✔	✔	✖	✔	✔	✖	✔
Li_x Soap	✔	✔	✔	✔	✔	✖	✖	✔	✔	✖
Li/Ca Soap	✔	✔	✔	✔	✔	✖	✔	✔	✖	✔
Na Soap	✖	✖	✖	✖	✖	✔	✔	✔	✖	✔
Bentonit	✔	✔	✔	✖	✔	✔	✔	✔	✖	✔
Ba_x Soap	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
Al_x Soap	✖	✖	✖	✔	✖	✖	✖	✔	✔	✔
Polyurea	✔	✔	✔	✖	✔	✔	✔	✔	✔	✔

x = Complex fat ✔ = Compatible ✖ = Incompatible

PLASTIC UNIVERSAL LUBRICANT

Semi-fluid multi-purpose lubricant based on highly refined mineral oil

CARLSON® PLASTIC UNIVERSAL LUBRICANT

LV series greases are based on highly refined mineral oil fortified with lithium soap. They have very good mechanical, thermal and oxidation stability. They have a fine short-fibre structure, are easy to pump and resist water well. They contain additives against oxidation and rusting. Applications: lubrication of plain and rolling bearings not subjected to high loads, operating in the operating temperature range from –30 °C to +140 °C, lubrication of some small gears.

DIN 51 502: K3N-30
ISO 6743-9:
L-X CDEB3

310 ml	33.372	8591522333728

310 ml

PLASTIC MULTI-PURPOSE LUBRICANT WHITE

LV Series Greases

CARLSON® PLASTIC MULTI-PURPOSE WHITE LUBRICANT

Multi-purpose grease is a universal lubricant containing Lithium. Due to its lithium content, it has very good resistance to salt water and oxidation caused by atmospheric influences. It is recommended as a lubricant for door hinges, guide rails, drawers, leather membranes, bearings, mechanical movements in general, motor parts, laser machine runs. Particularly suitable for lubrication and protection of mechanical parts of boats, boats, fishing tackle, weapons, sewing machines, bicycles, etc. It is resistant to high pressures, has excellent viscosity and displaces water.

- Mixture of lubricants and lubricants with lithium addition
- White lubricant with high adhesion
- Use at temperatures from –30 to +120° C
- High water resistance
- Leaves no carbon deposits

DIN 51 502: KPF2K-30
ISO 6743-9: L-X-CCHB-2

310 ml	33.771	8591522337719

310 ml

GREASE LV 2-3

High quality multi-purpose lubricant based on highly refined mineral oil

CARLSON® LV 2–3 GREASE

LV series greases are based on highly refined mineral oil fortified with lithium soap. They have very good mechanical, thermal and oxidation stability. They have a fine short-fibre structure, are easy to pump and resist water well. They contain additives against oxidation and rusting. Applications: lubrication of plain and rolling bearings not subjected to high loads, operating in the operating temperature range from –30 °C to +140 °C, lubrication of some small gears.

DIN 51 502: K3N-30
ISO 6743-9:
L-XCDEB 3

250 g	33.564	8591522335647
8 kg	33.565	8591522335654

GREASE G3

Waterproof calcium grease based on highly refined mineral oil and natural graphite

CARLSON® G 3 GRAEASE

Calcium-based grease manufactured on the basis of mineral oil containing at least 10% natural graphite. It is not recommended for use in the lubrication of rolling bearings and some delicate mechanisms. It is resistant to the action of cold water. Operating temperature range: –30 °C to +70 °C. Applications: highly loaded plain bearings, automotive leaf springs, open gears, worm gears, screw threads exposed to corrosive influences, moving bearings of machines operating in wet environments, typical assembly lubricant.

DIN 51 502: KF3C-30:
ISO 6743-9:
L-X-CAGB-3

250 g	33.566	8591522335661
8 kg	33.567	8591522335678

GREASE A 00 LI

Semi-fluid gear lithium grease based on highly refined mineral oil

CARLSON® A 00 LI GREASE

The semi-fluid lithium gear grease A 00 - Li is based on highly refined mineral oil. With regard to the required lubricating properties, it is enhanced with EP-type refining additives, additives improving adhesion, antioxidant and anti-corrosion properties.The A 00 - Li series grease is intended for lubrication of closed gearboxes (cylindrical and bevel gearboxes) operating in the temperature range from –30 °C to +100 °C. The A00 - Li grease is used at medium temperatures in this range and when the gearbox is well sealed.

DIN 51 502: GP00K-30
ISO 6743-9:
L-X-CCEB00

250 g	33.562	8591522335623
8 kg	33.563	8591522335630

VASELINE BEARINGS, HINGES, HINGES, COUPLINGS

Minimizes friction, protects against corrosion, extends service life

CARLSON® WHITE VASELINE

Multifunctional lubricant with universal use. It is suitable for use in a wide range of operating temperatures from –30 °C to +120 °C, for lubricating most types of bearings, hinges, hinges and joints in the domestic, automotive and mechanical industries.

400 ml	33.621	8591522336217

LUBRICANT LEAF FEATHERS, SPRINGS, THREADS

Minimizes friction, protects against corrosion, extends service life

CARLSON® GRAPHITE LUBRICANT

The product is designed especially for lubrication of highly heat and pressure stressed components. It is suitable for lubrication of automotive leaf pens, springs, gears and transmissions, threads, joints and other components exposed to the effects of corrosion in the automotive and mechanical industry.

400 ml	33.622	8591522336224

LUBRICANT SWITCHES, SHUT-OFF VALVES

Protection against scorching, multi-purpose use

CARLSON® ALUMINOUS GREASE

The lubricant is intended for lubrication of threaded parts of the exhaust system, brake system, foundry tools, switches, shut-off valves, for easy assembly and disassembly of bolts and nuts, but also as a protection of injection moulds against scorching and corrosion. Thanks to its aluminium micro-particles, it protects the surface from external influences and the effects of acids, alkalis or salt water.

400 ml	33.623	8591522336231

LUBRICANT FOR SLIDING SURFACES, JOINTS

Minimizes friction and wear, protects against corrosion, extends service life

CARLSON® CERAMIC LUBRICANT

Extremely high temperature resistance up to 1400 °C. Used for lubricating extremely temperature-loaded sliding surfaces or joints in the automotive or mechanical engineering industry.

400 ml	33.624	8591522336248

LUBRICATE CHAINS, BEARINGS, HINGES AND SLIDING SURFACES

Excellent lubricating properties, multi-purpose use, easy and quick application

CARLSON® LUBRICANT WITH PTFE

Multifunctional product with very good lubricating and preservative properties. It is suitable for use in a wide range of operating temperatures from –30 °C to +200 °C, for lubrication of chains, bearings, hinges and sliding surfaces in household, automotive and mechanical industry.

400 ml	33.625	8591522336255

LUBRICANT THREADED JOINTS, SPARK PLUGS, EXHAUSTS

Protects against wear, friction, corrosion and abrasion, facilitates assembly and disassembly

CARLSON® COPPER LUBRICANT

The product is intended for lubrication of highly heat-stressed bolts, nuts, threaded connections, spark plugs, exhausts, etc. It forms a durable film that protects against corrosion and abrasion and withstands temperatures up to +1000 °C. The product is not intended for use on aluminium objects.

400 ml	33.626	8591522336262

Supplier:

FILSON s.r.o., Slévačská 902/11, 198 00 Praha 9,
Czech Republic, tel.: +420 267 710 620, info@filson.cz, www.carlson-oil.cz