Innovative lubricants need experienced application engineers

Every lubricant change should be preceded by expert consultation on the application in question. Only then the best lubricant system can be selected. Experienced FUCHS engineers will be glad to advise on products for the application in question and also on our full range of lubricants.

Contact:

FUCHS EUROPE SCHMIERSTOFFE GMBH
Friesenheimer Straße 19
68169 Mannheim
Telephone: 0621 3701-0
Telefax: 0621 3701-570
E-Mail: zentrale@fuchs-europe.de
www.fuchs-europe.de

Rationalization and Cost Savings

Lubricants for Transport Companies and Municipal Fleets
We are a German company whose almost 600 employees manufacture and market a wide range of lubricants and derived specialties. The company, which was founded in 1931 as RUDOLF FUCHS, is located in Mannheim and is a 100% subsidiary of FUCHS PETROLUB AG, which is the largest independent lubricant manufacturer worldwide.

Our company’s degree of specialisation and innovation is way above the industrial average in this field. The full product line includes almost 2,000 lubricants and derived specialties for all walks of life, industrial processes and applications. Our customer’s success is also our success. Because partnership to us means passing-on benefits.

The advantage of a strong market presence: FUCHS is the largest independent manufacturer of lubricants in the world. The benefit of premium, innovative products from a full-line manufacturer: With a complete product line as well as tailor-made special solutions, FUCHS has a product for every application. The benefits of reliability: Certified according to ISO/TS 16949:2009 and DIN EN ISO 14001:2004, FUCHS has been continuously upgrading its highly specialised lubricants for decades.

And naturally, partnership for us also means providing our customers with competent support. With comprehensive marketing. With high-performance logistics. With the development of successful service concepts. And qualified consulting. Because together, we can achieve more.

FUCHS is a multinational, independent lubricant manufacturer. Our independence is the difference. We are open to new solutions, open for visions – the prerequisites for innovations. And innovation is the defining characteristic of FUCHS. In the great majority of our products are individual solutions. Challenge us and see!

We develop lubricants: application-specific and tailor-made for our customer’s processes. Together we look for the best lubricants for our customers. This cooperation is unique in terms of its form, scope and intensity. We call it development partnership. The success of our development partnerships is based on an important fact: FUCHS is not one of the oil-giants.
The Latest Generation of High-tech Lubricants.

A reduction in diesel exhaust pollutants is inevitable if only from an ecological viewpoint alone. Vehicle manufacturers are responding to this challenge with the development of exhaust treatment systems such as particle filters and catalysts. But vehicles fitted with exhaust treatment systems need particularly low-polluting engine oils if they are to operate reliably. With TITAN CARGO MAXX, we have developed a product which significantly prolongs the life of particle filters without detriment to engine performance and wear protection. With TITAN CARGO PRO GAS SW-30 we have „set a new bar“ for train intervals of MAN Natural Gas engines 60,000 km!

The information contained in this product information is based on the experience and know-how of FUCHS EUROPE SCHMIERSTOFFE GMBH in the development and manufacturing of lubricants and implements the current state of the art. The performance of our products can be influenced by a series of factors, especially the specific use, the method of application, the operational environment, the methods of maintenance and the quality of the materials used. The information refers to our experience and the experience of our users and represents general, non-binding guidelines. No warranty expressed or implied is given concerning the properties of the product or its suitability for any given application.

Our products undergo continuous improvement. We therefore retain the right to change our product program, the products, and their manufacturing processes as well as all details of our product information at any time and without warning. With the publication of this product information, all previous editions cease to be valid. Any form of reproduction requires express prior written permission from FUCHS EUROPE SCHMIERSTOFFE GMBH.

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In times of high fuel-prices more and more drivers are considering a change-over to CNG (Compressed Natural Gas) or LPG-operated vehicles. They guarantee reliable and long lasting operation of the engine. They verified successfully the outstanding capabilities of this new high-performance engine oils. TITAN PRO GAS engine oils are low-emission engine oils. With them special formula the combustion chamber keeps clean and the engine maintains its designed power output.

Your advantage: Lower Operating Costs.

Lubricants are by no means all the same: The high-performance lubricants from FUCHS offer you ultimate reliability at all temperatures, lower oil consumption, significantly lower fuel consumption and specifically extended service intervals. The advantages are tangible: Whenever engines and gearboxes run freer and more reliably, operating costs are lower if only because they consume less. And just 1 % lower fuel consumption means, depending on operating conditions, fuel savings of several hundred Euros per vehicle and year.

Come and see for yourself!

New series of gas powered engines. TITAN PRO GAS.

FUCHS has developed a new series of specific engine oils for gas powered engines to meet the needs of the increasing application of gas powered vehicles: TITAN PRO GAS. They guarantee reliable and long lasting operation of the engine. They verified successfully the outstanding capabilities of this new high-performance engine oils. TITAN PRO GAS engine oils are low-emission engine oils. With their special formula the combustion chamber keeps clean and the engine maintains its designed power output.

In times of high fuel-prices more and more drivers are considering a change-over to CNG (Compressed Natural Gas) or LPG (Liquefied Petroleum Gas). With these alternative fuel costs can be significantly reduced. In addition of fuel cost savings, with lower exhaust and CO₂ emissions CNG- or LPG-operated vehicles can be more environmentally friendly than conventional petrol or diesel vehicles.

However, a LPG- or CNG-operated vehicle needs more than a technical changeover. For reliable operation a specific engine oil is required which is optimized to the particular demands of the gas-powered engine.

Premium-Quality

TITAN UNIMAX ULTRA MC SAE 10W-40

Premium Motor Oil based on MC-synthese for all commercial vehicles, off-highway equipment and passenger cars. Substantial rationalization opportunities for mixed fleets. Prolongation of drain intervals possible with many manufacturers. Good cold starting and lower oil consumption.

Specifications/approvals

FUCHS recommendations

ACSA E7/E8/B3/A3/4 API-C-4, -5, SAE J18/1

MAN M 3271-1

MB-APPROVAL 229.1

MB-APPROVAL 228.1

RENAULT RLD 2

VW 505 00

High-Quality

TITAN UNIVERSAL HD SAE 15W-40

High Performance oil for mixed fleets operated under normal conditions. Good performance in normally aspirated and turbocharged diesel engines.

Specifications/approvals

FUCHS recommendations


DEUT DQC1/2 MAN 271

MB-APPROVAL 228.1

MB-APPROVAL 229.1

MTU TDC TYPE-2

FIAT SPEC 40/500

Engine oils for engines operated with natural gas

Premium-Quality

TITAN CARGO PRO GAS SAE 15W-40

Premium Performance, zinc-free, extreme fuel-economy oil for highly-supercharged commercial vehicle gas engines as well as diesel engines with exhaust gas after treatment systems. Specially developed for gas powered engines with and without turbocharger. Optimum cold starting, lower oil consumption and minimized exhaust emissions.

Specifications/approvals

FUCHS recommendations

ACSA C9

MAN M 3477

MAN M 3271-1

MAN M 3271-3

MB-APPROVAL 226.9

MB-APPROVAL 229.1

API CF

CUMMINS CES 20074

Engine oils for mixed fleets

Premium-Quality

TITAN CARGO PRO GAS SAE 10W-40

Ultra High Performance engine oil specially developed for highly-loaded gas fuelled engines in commercial vehicles. Optimum cold starting, lower oil consumption and minimized exhaust emissions.

Specifications/approvals

FUCHS recommendations

API CF

CUMMINS CES 20074

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**FUCHS Automotive Lubricants**

**Our Performance Program for Success.**

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**Engine oils for commercial vehicles**

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<th><strong>Specifications/ approvals</strong></th>
<th><strong>FUCHS recommendations</strong></th>
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<tr>
<td><strong>TITAN CARGO MAXX SAE 5W-30</strong></td>
<td>Premium MAXX Performance, zinc-free, extreme fuel-economy oil for highly-loaded commercial vehicle diesel engines. Specially developed for exhaust after treatment and turbocharger. Optimum cold starting, lower oil consumption and minimized exhaust emissions.</td>
<td>MAN M 3477 / MB-APPROVAL 228.51</td>
</tr>
<tr>
<td><strong>TITAN CARGO MAXX SAE 10W-40</strong></td>
<td>Premium MAXX Performance, fuel-economy oil for highly-loaded commercial vehicle diesel engines. Specially developed for exhaust after treatment and turbocharger. Good cold starting, lower oil consumption and minimized exhaust emissions.</td>
<td>ACEA E6/7/8/9, API CI-4, CUMMINS CES 20077, MAN M 3277 CRT</td>
</tr>
<tr>
<td><strong>TITAN CARGO MAXX LD SAE 10W-40</strong></td>
<td>Premium MAXX Performance, fuel-economy oil for highly-loaded commercial vehicle diesel and gas engines. Specially developed to match the requirements of the SCANIA Low Ash specification for EURO V engines fitted with Diesel particulate filter (DPF). Good cold starting, lower oil consumption and minimized exhaust emissions.</td>
<td>ACEA E7/8/9, API CI-4/SL, CUMMINS CES 20077, MAN M 3275-1</td>
</tr>
<tr>
<td><strong>TITAN CARGO SL SAE 5W-30</strong></td>
<td>Ultra High Performance, extreme fuel-economy oil for a variety of commercial vehicle diesel engines, formulated with fully-synthetic base oils. Specially developed for extended service intervals. Optimum cold starting and lower oil consumption.</td>
<td>ACEA E7/8/9, CUMMINS CES 20077/8, DAF HP 1160, DAF HP 1180, MAN M 3277</td>
</tr>
<tr>
<td><strong>TITAN CARGO MC SAE 10W-40</strong></td>
<td>Ultra High Performance, fuel-economy oil based on MC-synthesis for extended service intervals. Good cold starting and lower oil consumption.</td>
<td>ACEA E7/8/9, CUMMINS CES 20077/8, DAF HP 1160, MAN M 3277</td>
</tr>
</tbody>
</table>

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**TITAN CARGO SAE 5W-40**

**Ultra High Performance, fuel-economy oil, specially developed for commercial vehicle diesel engines with extended service intervals, exhaust after treatment and turbocharger.**

**Specifications/ approvals**

<table>
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<tr>
<td>ACEA E6/7, API CI-4, CUMMINS CES 20077/8, DAF HP 1160, MAN M 3277</td>
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**TITAN TRUCK PLUS SAE 10W-40**

**Super High Performance oil for a variety of diesel and gasoline engines. Specially for highly-loaded commercial vehicle diesel engines. Lower oil consumption.**

**Specifications/ approvals**

<table>
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<th><strong>FUCHS recommendations</strong></th>
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<tr>
<td>ACEA E7, API CI-4/SL, CUMMINS CES 20077/8, MAN M 3275-1, DAF HP 1180, SCANNIA LA, MAN M 3275-1, VOLVO VDS-3</td>
</tr>
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Edition: 3/2011
Our Performance Program for Success.

**Gear oils for commercial vehicles**

**Premium-Quality**

**TITAN CYTRAC SL SAE 75W-90**
- Premium gear oil for highly-stressed hypoid axles in commercial vehicles formulated with fully-synthetic base oils. Developed for the longest oil change intervals in commercial vehicle axle drives.
- SAE 75W-90
- Fully-synthetic base oils
- Suitable for the longest oil change intervals.
- API GL-5
- MAN M 342 TYPE S1
- MB-APPROVAL 235.8
- ZF TE-ML 07, 08
- SCANIA STO 1:0
- MAN 342 TYPE S1
- MB-APPROVAL 235.8

**TITAN CYTRAC MB SYNTH SAE 75W-90**
- Premium gear oil for extended drain intervals in commercial vehicles, specially developed for Mercedes-Benz Actros vehicles, formulated with fully-synthetic base oils. Reduces fuel consumption by improving gearbox efficiency. Suitable for the longest oil change intervals.
- SAE 75W-90
- Fully-synthetic base oils
- Reduces fuel consumption by improving gearbox efficiency.
- API GL-5
- MAN 341 TYPE MB
- MB-APPROVAL 235.11
- ZF TE-ML 08

**TITAN CYTRAC MAN SYNTH SAE 75W-80**
- Premium gear oil for extended drain intervals in commercial vehicles manual gearboxes, specially developed for manual and automatic ZF-gearboxes, formulated with fully-synthetic base oils.
- SAE 75W-80
- Fully-synthetic base oils
- Reduces fuel consumption by improving gearbox efficiency.
- API GL-4
- MAN 341 TYPE Z4
- ZF TE-ML 02D, 16K
- ZF TE-ML 08

**TITAN CYTRAC LD SAE 75W-80**
- Ultra High Performance gear oil for extended oil change intervals in commercial vehicles fitted with integral retarders or supplementary retarders.
- SAE 75W-80
- Fully-synthetic base oils
- API GL-4
- Case MS 1316
- MIL-L-2105 D
- ZF TE-ML 02C, 16C, 21C

**TITAN CYTRAC HSY SAE 75W-90**
- Ultra High Performance gear oil for commercial vehicle manual transmissions and axle drives formulated with fully-synthetic base oils.
- SAE 75W-90
- Fully-synthetic base oils
- API GL-4
- MAN M 343 TYPE E3
- MAN M 341 TYPE 23
- ZF TE-ML 02D
- ZF TE-ML 08

**TITAN GEAR HYP LD SAE 80W-90**
- Super High Performance axle oil specially developed for Mercedes-Benz commercial vehicles. Offering enhanced thermal stability and fuel-economy potential.
- SAE 80W-90
- Fully-synthetic base oils
- MIL-FR-2105 E-ARVIN
- MACK GG-J
- ZF TE-ML 03A, 16C, 17B, 19B, 21A

**Gear oils for mixed fleets**

**High-Quality**

**TITAN SUPERGEAR MC SAE 80W-90**
- Super High Performance gear oil based on MC-synthesis for extended oil change intervals.
- SAE 80W-90
- Fully-synthetic base oils
- API GL-4/GL-5
- SCANIA STO 1:0
- MAN 341 TYPE E1
- MAN 341 TYPE 21
- MB-APPROVAL 235.5
- ZF TE-ML 02A, 17A

**TITAN SUPERGEAR MC SAE 80W-140**
- Super High Performance gear oil based on MC-synthesis for extended oil change intervals.
- SAE 80W-140
- Fully-synthetic base oils
- API GL-4/GL-5
- SCANIA STO 1:0
- MAN 341 TYPE E1
- MAN 341 TYPE 21
- MB-APPROVAL 235.5
- ZF TE-ML 02A, 17A

**TITAN GEAR LS SAE 90**
- High Performance LS (limited slip) hypoid gear oil for axles in commercial vehicles and passenger cars with or without limited slip differentials.
- SAE 90
- Fully-synthetic base oils
- API GL-5
- Case MS 1317
- MIL-L-2105 D
- FORD M2C104-A
- FORD M2C197-A
- ZF TE-ML 05C, 12C, 16C, 21C

**TITAN GEAR MP SAE 80**
- High Performance gear oil for synchronized and non-synchronized manual gearboxes as well as auxiliary drives, axles and differentials in commercial vehicles and passenger cars.
- SAE 80
- Fully-synthetic base oils
- API GL-4
- Case MS 1317
- MIL-L-2105 D
- FORD M2C104-A
- FORD M2C197-A
- ZF TE-ML 05C, 12C, 16C, 21C

**TITAN GEAR HYP SAE 90**
- High Performance gear oil for highly-stressed differentials in commercial vehicles and passenger cars.
- SAE 90
- Fully-synthetic base oils
- API GL-5
- MAN M 342 TYPE M1
- MB-APPROVAL 235.0
- ZF TE-ML 05A, 16C, 17B, 19B, 21A

**Specifications/approvals**

- API GL-5
- MAN M 343 TYPE E3
- MB-APPROVAL 235.11
- ZF TE-ML 07, 08
- SCANIA STO 1:0
- MAN 342 TYPE S1
- MB-APPROVAL 235.8
- ZF TE-ML 07, 08
- SCANIA STO 1:0
- JOHN DEERE JDM J 11 E/G
- VOLVO 97312
- ZF TE-ML 07, 08
### Automatic Transmission Fluids (ATF)

**Premium-Quality**
- **TITAN ATF 5005**
  - MAN 339 TYPE V2
  - MAN 339 TYPE 22
  - MB-APPROVAL 236.6
  - VDS 6333, 3X (G 1342)
  - ZF TE-M 300, 000, 14B, 14L, 17C
- **TITAN ATF 4000**
  - Ultra High Performance ATF for use in automatic transmissions as well as other ATF applications. Licensed according to DEXRON II (H). Improved low-temperature shifting compared to DEXRON II.
  - Allison C-4
  - Allison TES 389
  - DEXRON II (H)
  - MAN 339 TYPE V1
  - MAN 339 TYPE 21
  - MB-APPROVAL 236.1
  - VDS 6335.3X (G 607)
  - ZF TE-M 304, 040, 14A, 17C
- **TITAN ATF 3000**
  - Super High Performance DEXRON II (D) ATF for all automatic transmissions in commercial vehicles, machinery and passenger cars according to manufacturer’s documentation.
  - MAN 339 TYPE V1
  - MAN 339 TYPE 21
  - MB-APPROVAL 236.1
  - VDS 6335.3X (G 607)
  - ZF TE-M 304, 040, 14A, 17C

**Specifications/approvals**
- TITAN ATF 5005
  - TITAN ATF 4000
  - TITAN ATF 3000

**FUCHS recommendations**
- DEXRON II (H)
- Allison TES 295
- Allison TES 189
- BMW 81 22 9 400 272
- BMW 81 22 9 400 275
- BMW 83 22 9 407 738
- BMW 83 22 9 407 827
- BMW 83 22 9 407 858
- BMW 83 22 9 407 859
- FORD MERCON
- MAN 339 TYPE 23
- OPEL 19 40 707
- VOLVO 97341
- VW TL 521 62 (G 052 162)
- ZF TE-M 04, 04, 11B, 14C

### Hydraulic oils

**Premium-Quality**
- **TITAN HYD MR 530 MC**
  - Ultra High Performance multigrade hydraulic oil for construction machinery as well as diverse motor vehicle applications.
  - MAN M 3289
- **TITAN HYD 1030**
  - Super High Performance multigrade hydraulic oil for general machinery and motor vehicle applications.
  - CAT TO-2
  - FORD MERCON
  - OPEL 19 40 700
  - OPEL 19 40 707
  - OPEL 19 40 766
  - PSA S712710
  - VOLVO 1161529
  - ZF TL 521 46 (G 002 000/A7/A8/G 004 000)

**Specifications/approvals**
- MAN M 3289
- FORD M2C204-A
- OPEL 19 40 766
- PSA S712710
- VOLVO 1161529
- ZF TL 521 46 (G 002 000/A7/A8/G 004 000)

**FUCHS recommendations**
- MAN M 3289
- FORD M2C204-A
- OPEL 19 40 766
- PSA S712710
- VOLVO 1161529
- ZF TL 521 46 (G 002 000/A7/A8/G 004 000)

### Central hydraulic fluids

**Premium-Quality**
- **TITAN ZH 4300 B**
  - Premium performance central hydraulic fluid formulated with fully-synthetic base oils.
  - MAN M 3289
- **TITAN PSF**
  - Super High Performance power steering fluid approved by Mercedes-Benz for passenger cars and commercial vehicles.
  - MB-APPROVAL 236.3

**Specifications/approvals**
- MAN M 3289
- FORD M2C204-A
- OPEL 19 40 766
- PSA S712710
- VOLVO 1161529
- ZF TL 521 46 (G 002 000/A7/A8/G 004 000)

**FUCHS recommendations**
- MB-APPROVAL 236.3

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Edition: 3/2011
**Greases**

**Premium-Quality**

- **RENOLIT LZB 2 H**
  - Highly adhesive, Premium Performance-quality, longlife EP grease based on lithium soap for all plain and roller bearings, as well as central lubrication systems in commercial vehicles and general machinery.
  - Excellent corrosion protection even in the presence of saltwater, -30 °C to +140 °C.

- **RENOLIT LZB 000**
  - Semi-fluid grease for engine vehicle central lubrication systems. Gear grease for gearboxes in municipal machinery. Observe manufacturer’s recommendations, -40 °C to +110 °C.

- **RENOLIT FLM 2**
  - Universal, High Performance grease with solid lubricant additives, with excellent wear protection. For the lubrication of commercial vehicles and machinery. Proven under extreme conditions such as construction machinery, -30 °C to +140 °C.

- **RENOLIT CX-HT 2**
  - Also available for use in FUCHS system grease guns. Also in NLGI grade 0 available.

- **RENOLIT DURAPLEX EP 2**
  - Special grease for the long-term lubrication of plain and roller bearings, such as vehicle clutch/brake bearings, highly-stressed construction machinery bearings, etc., -30 °C to +160 °C.

- **RENOLIT LX-PEP 2**
  - Special grease based on lithium complex soaps for longlife applications. Good corrosion protection, thermally and mechanically stable, suitable for wheel bearings of cars and trucks, -30 °C to +150 °C.

**High-Quality**

- **RENOLIT MP**
  - Standard, multipurpose EP grease. Suitable for low temperatures, -40 °C to +120 °C.

- **RENOLIT MP PLUS**
  - Only available for use in FUCHS system grease guns.
  - High Performance, multipurpose EP grease for plain and roller bearings with excellent adhesion, optimum corrosion protection and very good ageing stability, -30 °C to +120 °C.

- **RENOLIT MP 735**
  - High Performance, multipurpose EP wheel bearing grease. NLGI grade 1/2, -40 °C to +120 °C.

**Specifications/approvals**

- **FP 7N-30**
- **ISO-L-CDB 2**

**FUCHS recommendations**

**Brake fluids**

**High-Quality**

- **MAINTAIN DOT 5.1**
  - High-Performance brake fluid for hydraulic brake systems and clutch actuation in passenger cars, trucks, and motorcycles.
  - FP 9N13, ISO 4925 CLASS 4/5/1 SAE J1703/1704

- **MAINTAIN DOT 4**
  - High-Performance brake fluid for hydraulic brake systems and clutch actuation in passenger cars, trucks, and motorcycles.
  - MAN 283 Li-P 000000

**Specifications/approvals**

- **UNILOAD**
  - +200 °C, NLGI grade 2, also available in spray can as wear. Recommended for the greasing of gear wheels, -20 °C to +350 °C.

**Antifreeze/ Diesel additives**

**Premium-Quality**

- **MAINTAIN FRICOFIN DP**
  - Coolant additive based on monoethylene glycol. Free from nitrite, amine, and phosphate.
  - ASTM D3306, D3895, BS 6580, SAE J1034

- **MAINTAIN FRICOFIN LL**
  - COOLANT additive based on monoethylene glycol. Free from nitrite, amine, and phosphate and silicates.
  - ASTM D3306, D3895, BS 6580, SAE J1034

**Specifications/approvals**

- **ASTM D3306**
- **SAE J1034**

**FUCHS recommendations**

- **SCANIA TR 1451**
- **VW TL 774-G**
- **MAN 283 Li-P 000000**
Our High Performance Product Program for the Most Difficult Applications.

PLANTO Lubricants

Rapidly biodegradable hydraulic oils

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PLANTO ENVIRO HYD 46 HVI
Naturally biodegradable, high-performance hydraulic fluid based on selected saturated esters. Awarded the European Eco Label (“Eco-Mark”).

ISO VG 12/20
ISO IS 380
HES
FMTZ KTM 28/2006
VOLKSBILMACHERKEN

PLANTOSYN 3268
Naturally biodegradable, universal multigrade hydraulic oil based on fully saturated synthetic esters. Awarded the Blue Angel environmental seal.

ISO VG 12/20
ISO IS 380
HES
FMTZ KTM 28/2006
VOLKSBILMACHERKEN

Rapidly biodegradable lubricants

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<td>BundesfV Gr 3095</td>
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</table>

PLANTOGEL 2 S
Rapidly biodegradable EP grease based on synthetic esters for plain and roller bearings. Water resistant, easily pumpable in central lubrication systems, -40°C to +120°C.

PLANTOGEL 2 FS
Rapidly biodegradable EP grease with graphite additives, -30°C to +120°C.

PLANTOGEL 000 S
Rapidly biodegradable semi-fluid EP grease for central lubrication systems of motor vehicles, industrial machinery and machine tools. Gear grease for gearboxes also in municipal machinery. Observe manufacturer recommendations, -40°C to +120°C.

An Easy Guide to Engine Oils and Their Specifications.

There are all sorts of engine oils with all sorts of specifications. What the most important engine oil specifications mean are shown below:

ACEA
European ACEA classifications use letters to categorize engine oils by application. ACEA E stands for commercial diesel engines.

E1 invalid since March 2000.
E2 normal applications / normal intervals / largely based on MB 228.1 and MAN 271.
E3 invalid since October 2004.
E4 extremely difficult applications / Euro 1, 2 and 3 / extended oil change intervals possible / largely based on MB 228.5 and MAN 3277.
E5 invalid since October 2004.
E6 for EGR engines with / without diesel particle filters and SCR NOX engines; recommended for engines fitted with diesel particle filters running on sulphur-free fuel; sulphate ash content < 1% (wt.).
E9 for Euro 5 engines, EGR and DPF – new category, partially based on the API CJ-4 specification.

API
Direct injection diesel engines
API CF-4 surpasses API CE in terms of carbon deposits and oil consumption. For full-throttle operating diesel engines (standard exists since 1990).
API CG-4 for highly-stressed diesel engines and fuel sulphur < 0.5 %. Required for engines designed in line with 1994 exhaust gas regulations.
API CI-4 since March 2003, for AGR engines meeting TIER II (US exhaust gas thresholds), surpasses CH-4 valid since 2006, for all highway vehicles fitted with engines complying with USA 2007 exhaust gas standards when using diesel fuel with max. 500 ppm sulphur. Suitable for exhaust gas treatment systems such as particle filters and SCR catalysts.

JASO
JASO DH-1
Is a Japanese specification. All tests are performed on Japanese engines. JASO DH-1 characterizes high performance and wear protection, high-temperature oxidation stability and carbon deposits and other properties to common API classified oils such as API CD in Japanese engines.

JASO DH-2
For commercial vehicle diesel engines with exhaust gas treatment. Only for diesel fuel containing under 50 ppm sulphur. For commercial diesel engines with exhaust gas treatment, only for diesel fuels with less than 50 ppm sulphur.

GLOBAL
Global DHD-1
Is the specification which covers the harmonization of the existing specifications ACEA, API and JASO. Tests for Global DHD-1 are based on ACEA, API and JASO tests.