4.1.1 Quality

Lube oils are classified by **DEUTZ** into quality classes according to their performance capability. Oils according to other comparable specifications can be used.

	Permissible oils:		
Deutz	DQCI-02	DQCII-05	DQCIII*+DQCIV#
ACEA	E2-96	E3-96/E5-02/ E7-04	E4-99/ E6-04
API	CF/CF-4	CH-4/CG-4	-
DHD	-	DHD-1	-

DQCIII-05 * Annex 1

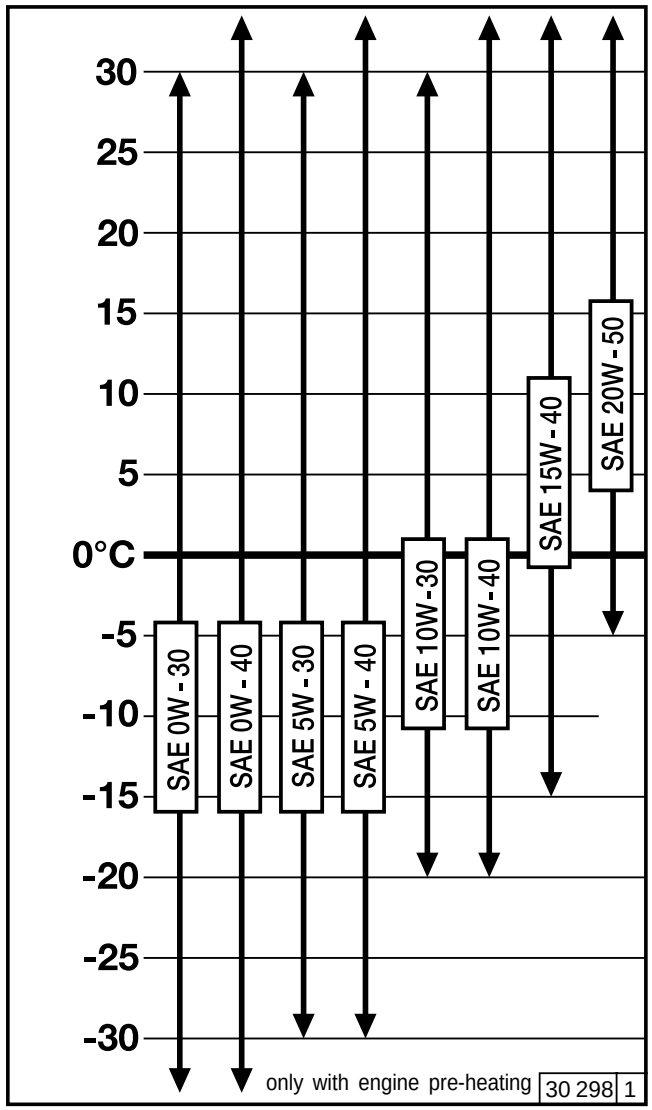
DQCIV-05 # **only fully synthetic**

The exact assignment of permissible oil quality and oil change intervals to the engines is listed in chapter 6.1.1.
In case of doubt, please ask your service representative.

*For oil change intervals see 6.1.1
For oil filling amounts see 9.1

4.1.2 Viscosity

Since lube oil changes its viscosity (viscidity) depending on temperature, the ambient temperature of the location of engine operation is decisive for the selection of viscosity class (SAE class). Refer to the oil viscosity diagram on the right to achieve optimal operating performance.
Falling below the temperature limits occasionally can impair the cold start ability, but will not lead to engine damages. In order to minimise wear, the operating limits should not be exceeded over a long period of time. Oil changes determined by the time of year can be avoided by using multi-viscosity oils. Multi-viscosity oils, in particular smooth running oils, also have the effect of reducing fuel consumption.



DEUTZ lube oil quality level DQC III			Annex 1
Manufacturer	Lube oil type	SAE class	Availability
DEUTZ	**DEUTZ ÖITLX-10W40**	**FE 10W-40**	**Europe**
ADDINOL	ADDINOL SuperTruck MD 1048	10W-40	Europe, Asia
ADDINOL	Ultra TruckMD 0538	5W-30	Europe, Asia
AGIP	Agip SigmaUltra TFE	10W-40	worldwide
Autol	Valve UltraFE	10W-40	Germany
ARAL	Aral MegaTurboral	10W-40	worldwide
Aral	SuperTurboral	5W-30	worldwide
AVIA	TURBOSYNTHHT-E	10W-40	Germany
BAYWA	BayWa SuperTruck 1040 MC	10W-40	Southern Germany
BayWa	Turbo4000	10W-40	Southern Germany
BP OIL	International BP Vanellus E7 Plus	10W-40	Europe
BP	Vanellus E7Supreme	5W-40	Europe
Castrol	CastrolSYNTRUCK	5W-40	Europe, North America, Brazil, Argentina, Australia, South Africa
Castrol	Castrol DYNAMAX	7.5W-40	Europe, North America, Brazil, Argentina, Australia, South Africa
CEPSA	EUROTRANSSHPD	10W-40	Spain, Portugal
CHEVRON	Chevron Delo400 Synthtic	5W-40	North America
DEA	DEA CronosSynth	5W-30	Germany, Europe
DEA	Cronos PremiumLD	10W-40	Germany, Europe
DEA	Cronos PremiumLD	10W-40	Europe
ESSO	EssolubeXTS 501	10W-40	Europe
FUCHS	EUROPE Fuchs Titan Cargo MC	10W-40	worldwide
Fuchs	Titan UnicPlus MC	10W-40	worldwide
MOBIL	OIL Mobil Delvac 1 SHC	5W-40	Europe, SE Asia, Africa
Mobil	Delvac	15W-40	worldwide
Mobil	Delvac XHP Extra	10W-40	Europe, SE Asia
Lube oil refinery	Wintershall TFG	10W-40	Europe, Salzbergen
Shell	International ShellMyrina TX / Shell Rimula Ultra	5W-30	Europe, code country specific, varies
	Shell MyrinaTX / Shell Rimula Ultra	10W-40	Europe, code country specific, varies
Texaco	Ursa Super TDX 10W-40	10W-40	Europe
	Ursa Premium FE 5W-30	5W-30	Europe
TOTALFINA ELF	TOTAL RUBIA TIR 8600	10W-40	worldwide
	ELF PERFORMANCE EXPERTY MX 1010	10W-40	worldwide
	ELF PERFORMANCE EXPERTY MX 1012	10W-40	Germany, Benelux, Scandinavia, Austria
	FINA KAPPA FIRST	5W-30	Europe
	FINA KAPPA ULTRA	10W-40	Europe

This table will be extended if necessary.

4.2.1 Quality

Use standard diesel fuels with a sulphur content of less than 0.5 %. If the sulphur content is higher, the oil change intervals must be reduced (see 6.1.1).

The following fuel specifications are permitted:

- **Diesel fuels**
  - DIN EN 590
- **JIS K 2204 grade 1 and 2 ***
- **ASTM D 975-88; 1-D and 2-D ***

***** as long as the lubrication properties correspond to diesel fuel EN 590 (positive test results are necessary)

(see TR 0199-99-3005)

If other fuels are used which do not meet the requirements of the technical circular, the warranty will be voided.

Technical circular is obtainable from the DEUTZ Service Organisation.

The certification measurements for the observance of legal emission limits are carried out with the test fuels defined by legislation. These correspond to the diesel fuels described in section 1 in accordance with EN 590 and ASTM D 975. Emission values cannot be guaranteed with the other fuels described in this circular.

4.2.2 Winter fuel

At low ambient temperatures paraffin discharges can lead to blockages in the fuel system and cause operating faults. Use winter fuel at outside temperatures below 0 °C (to -20 °C) (generally offered by petrol stations in good time before the cold season begins).

- Paraffin should be added at temperatures below -20 °C. The mixing ratios required are as per the diagram on the right.
- Special diesel fuels can be used for arctic climates to -44 °C.

Íf it is necessary to use summer diesel fuel under 0 °C, paraffin can also be added by up to 30% as per the diagram on the right.

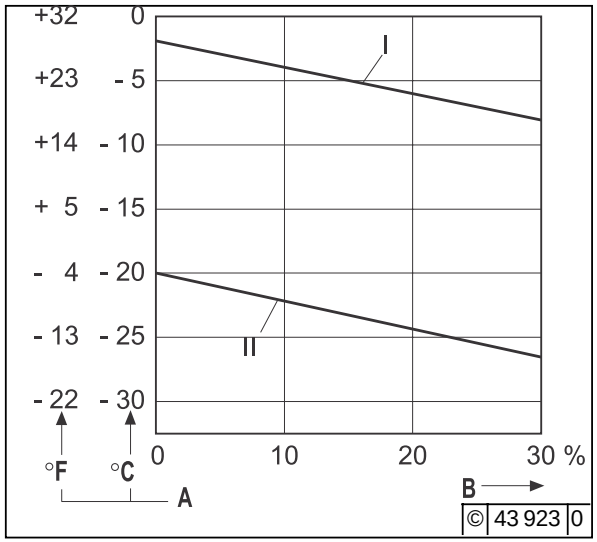


Diagram key:	
I	Summer diesel fuel
II	Winter diesel fuel
A	Outside temperature
B	Paraffin mixing proportion

For the engines **TCD 2013 4V** and fuel according to ASTM D 975 1-D/2-D, adding paraffin is not permissible.

Generally, sufficient resistance to cold can also be achieved by adding a flow ameliorant. For questions regarding this please contact your **DEUTZ partner.**

Only carry out mixing in the tank! First pour in the necessary amount of paraffin, then the diesel fuel.

4.3.1 Water quality for coolant

The following values may not be exceeded or fallen short of.
A test case can be requested from DEUTZ Service under the order no. 1213 0382 for checking your water quality.

Analysis values	min.	max.
ph value at 20 °C	6.5	8.5
Chloride ion content[mg/dm3]	-	100
Sulphate ion content[mg/dm3]	-	100
Total hardness [°dGH]	3	20

* Carbonate hardness proportion of total hardness min 3 dGH

Contact your local waterworks for information regarding the water quality.

4.3.2 Coolant preparation

Particular attention should be paid to preparing and inspecting the coolant in liquid-cooled engines, as otherwise corrosion, cavitation and freezing damages can occur on the engine.
Preparation of the coolant involves mixing a cooling system preservative to the cooling water.
The cooling system must be monitored regularly, see 5.1. This includes checking the concentration of the cooling system preservative, as well as inspecting the coolant level.
The inspection of the concentration of cooling system preservative can be carried out with standard testing devices. (Example: gefo glycomat®).

Mixing cooling system preservatives of a **nitrite base** with substances of an **amine basis** forms harmful nitrosamines.

4.3.3 Cooling system preservative

Using the cooling system preservative, order no. 01011490/ 01016416/12211500 (nitrite, amine and phosphate free, available in 5/ 20/ 210 litre containers), provides effective protection against corrosion, cavitation and freezing.
The cooling system preservative in the coolant must not fall below or exceed the following concentrations:

Cooling system preservative proportion	Water proportion	Cold protection to
min. 35 %	65%	-22 °C
40 %	60%	-28 °C
max. 45 %	55%	-35 °C

For filling amounts see the table overleaf in combination with the information in chapter 9.1.
The use of other cooling system preservatives, e.g. chemical corrosion preservatives, is possible in exceptional cases, consult DEUTZ Service.

Order the cooling system preservative from:
DEUTZ AG

Cooling system preservatives must be disposed of in an environmentally friendly manner.