NAME: CHARGES OF COOLANTS FOR TEDOM ENGINES

The following cooling media are approved for TEDOM engines:

1. Water charge with DCA 4 inhibitor
2. Cooling media without additional inhibition (without DCA 4)
3. Cooling media usable only for the area of USA and Canada

1. Water charge with DCA 4 inhibitor

1.1 Water charge is **a/** treated water (see 1.2) with DCA 4 inhibitor
b/ distilled water with DCA 4 inhibitor

1.2 The treated water must meet the following conditions:

TREATED WATER PROPERTIES	
pH at 20 °C	7.7 – 9
Sulfates (SO_4)	max. 50 mg/l
Chlorides (Cl)	max. 50 mg/l
Total hardness	max. 2 mmol/l (11.2 °dH)
Solids	0.005 % hm
Bacteria, fungi, yeasts	are inadmissible

1.3 Follow the procedure below to determine the concentration of DCA 4 inhibitor in the water charge:
- determine the total volume of the cooling system in litres
- use item 1.3.1 in Table to determine the number of DCA 4 units for a basic treatment
- use item 1.3.2 in Table to determine the number of DCA 4 units for maintenance dose after each 20 000 to 32 000 km or 500 hours of operation
- to fill the system for the first time or when performing replacement, count the DCA 4 units according to Table in item 1.3.1 and 1.3.2
- use item 1.3.3 in Table to determine the volume of DCA 4 that corresponds to the counted number of units and add the volume defined this way into the cooling system

1.3.1 Basic dose of DCA 4

cooling system volume in litres	required number of DCA 4 units
12 – 18	12
19 – 28	20
29 – 43	30
44 – 58	40
59 – 77	50
78 – 115	80
116 – 191	120
192 – 285	180

1.3.2 The maintenance dose of DCA 4 after 20 000 to 32 000 km or 500 hours of operation:

cooling system volume in litres	required number of DCA 4 units
1 – 19	4
20 – 39	8
40 – 58	12
59 – 77	16
78 – 115	30
116 – 190	50
191 – 285	80

1.3.3 DCA 4 inhibitor is manufactured by Fleetguard in this commercial packaging (fluid):

trade mark	number of units	volume in litres
DCA 60L	5	0.5
DCA 65L	20	2
DCA 75L	200	19
DCA 80L	2200	208

1.4 The wastages occurring due to leakages must be replenished with adequate water charge that was replenished with DCA 4 inhibitor.

1.5 DCA 4 concentration can be checked using CC 2602M coolant test strips made by Fleetguard.

1.6 Overdosing or insufficient concentration of DCA 4 may result in a damage to the components of the cooling system.

1.7 Replacement of the water charge is performed each time when any of the criteria below is complied with: 320 000 km or 2 years or 2500 hours of operation.

1.8 If water charge is used, emptying of the cooling system must be ensured in case of a frost. Freezing of water in the cooling system may cause serious failures

1.9 DCA 4 and CC 2602M can be bought in the branch offices of Fleetguard or in the CUMMINS service network.

2. Cooling media without additional inhibition (without DCA 4)

2.1 Anti-freeze mixture is a mixture of coolant and distilled or treated water.

2.1.1 Treated water must meet the conditions under 1.2

2.1.2 The concentration of coolant and water is specified in a ratio of 50:50%. This concentration provides protection against corrosion, cavitation, and against frost down to -38 °C (CHEVRON/TEXACO/CALTEX DELO XLC), to -33 °C (CHEVRON/TEXACO/CALTEX DELO XLC – PG), to -36 °C (MAXIGEL PLUS, ADDINOL ANTIFREEZE EXTRA).

2.2 Approved coolants without additional inhibition

Name	Manufacturer
MAXIGEL PLUS	TOTAL
Q8 ANTIFREEZE LL	KUWAIT PETROLEUM
Q8 MAHLER COOL	KUWAIT PETROLEUM
DELO XLC	CHEVRON/TEXACO/CALTEX
DELO XLC – PG	CHEVRON/TEXACO/CALTEX
ADDINOL ANTIFREEZE EXTRA	ADDINOL

2.3 The wastages occurring due to leakages must be replenished with anti-freeze mixture with specified concentration under 2.1.2

2.4 Replacement of the anti-freeze mixture is performed when any of the criteria below is complied with:
- 650 000 km (8 000 hours of operation) for mobile engines
- 16 000 hours of operation for stationary engines
- 5 years

2.5 In case the cooling system was once filled with anti-freeze mixture, it is already disapproved to switch to a mere water-charge cooling for there is a risk that the rubber elements may loose their tightness.

3. Cooling media usable only for the area of USA and Canada

3.1 Anti-freeze mixture is a mixture of coolant and distilled or treated water.

3.1.1 Treated water must meet the conditions under 1.2

3.1.2 The concentration of coolant and water is specified in a ratio of 50:50%. This concentration provides protection against corrosion, cavitation, and against frost down to -33 °C.

3.2 Approved coolants

Name	Manufacturer
DELO Extended Life Coolant/Antifreeze PG (DELO ELC PG)	CHEVRON/TEXACO/CALTEX

3.3 The wastages occurring due to leakages must be replenished with anti-freeze mixture with specified concentration under 3.1.2

3.4 Replacement of the anti-freeze mixture is performed when any of the criteria below is complied with:
- 1 200 000 km (14 000 hours of operation) for mobile engines
- 12 000 hours of operation for stationary engines
- 8 years

3.5 In case the cooling system was once filled with anti-freeze mixture, it is already disapproved to switch to a mere water-charge cooling for there is a risk that the rubber elements may loose their tightness.

4. Safety

4.1 When handling and storing the anti-freeze mixture, coolants, and DCA 4 inhibitor that are stated in this Guideline it is necessary to observe the safety regulations specified by the manufacturer in the manuals and on the packages.

5. Disposal

5.1 The anti-freeze mixture can be disposed of:

- by incineration in the incineration plants as instructed by the coolant manufacturer
- through specialized companies

5.2 The water charge with DCA 4 inhibitor is disposed of in biological treatment plants or through specialized companies

6. Warranties

6.1 This Guideline is obligatory for the provision of Warranty.

6.2 Failure to adhere to this Guideline may result in a damage to the engine and the complete cooling system.

6.3 If there is a case when uncertified coolant or inhibitor are used, user must follow the instructions provided by the manufacturers of these fluids. User must solve casual problems with corrosion, cavitation, freezing, overheating, and leakages with these manufacturers (including the costs).