



DEUTZ cooling system protective agent DQC – DEUTZ Quality Class High-speed diesel engines, release conditions

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1 Area of application

This Company Standard sets out the conditions for suppliers for cooling system protective agents to be used with high-speed, water-cooled DEUTZ diesel engines. It includes specifications regarding DEUTZ cooling system protective agent quality classes (DQC) as well as the requirements and approval procedures.

The initial material test and approval is performed by "R&D - Engine Oils, Fuels & Chemical Analysis" department at DEUTZ AG in cooperation with the responsible technical departments (Quality, Testing, Materials Technology).

DEUTZ is the sole owner of the trademark DQC that is protected for all countries of the European Union Office for Harmonization in the Internal Market at the official file number **012454112**. Shares after this factory standard are limited to the non-exclusive right to use the mark in connection with distribution of the released lubricating oils for the identification of these lubricating oils according to this factory standard.

The initial sample testing and approval is performed by the "R&D - Engine Oils, Fuels & Laboratory Analysis" department at DEUTZ AG.

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2 Cooling system protective agent quality classes

Which cooling system protection qualities in accordance with DQC are approved for DEUTZ engines are defined in the Technical Newsletter 0199-99-01228 and in the operating instructions for the different engine series.

DQC CA-14	Cooling system protective agents, contains silicate, based on MEG (monoethylene glycol)
DQC CB-14	Cooling system protective agents, does not contain silicates, based on organic acid (OAT) and MEG
DQC CC-14	Cooling system protective agents, contains silicate, based on organic acids (OAT) and (MEG)

Cooling system protective agents newly approved in accordance with the current TR 0199-99-01115/9 in the product groups A and B **are only valid until 12/31/2014**.

The cooling system protective agent properties must not alter during periods of normal storage and must be miscible in any ratio with other cooling system protection agents approved by DEUTZ within the product groups. No precipitation, layering or opacity may occur in these mixtures. The cooling system protective agent must be free of any solid particles and water.

Cooling system protective agents approved in accordance with this standard may not contain any materials that are not REACH compliant.

2.1 Cooling system protective agent quality class DQC CA-14

Cooling system protective agents in accordance with DEUTZ Cooling system protective agent quality class DQC CA-14 may be approved by DEUTZ if the following specifications have been fulfilled:

- **DQC CA-14** Cooling system protective agents, contains silicate, based on MEG

Cooling system protective agents that correspond with this product group and which have been subject to DEUTZ approval testing and have been approved by DEUTZ in writing may be listed in the data sheets or other publications by the cooling system protective agent manufacturers as complying with cooling system protective agent quality class DQC CA-14. Such claims may not be used for cooling system protective agents which have not been approved.

In the framework of the specifications in TR 0199-99-01228, mixture ratios are permissible for cooling system protective agent as per DQC CA-14 approvals.

2.2 Cooling system protective agent quality class DQC CB-14

Cooling system protective agents in accordance with DEUTZ Cooling system protective agent quality class DQC CB-14 may be approved by DEUTZ if the following specifications have been fulfilled:

- **DQC CB-14** Cooling system protective agents, does not contain silicates, based on organic acid (OAT) and MEG

Cooling system protective agents that correspond with this product group and which have been subject to DEUTZ approval testing and have been approved by DEUTZ in writing may be listed in the data sheets or other publications by

the cooling system protective agent manufacturers as complying with cooling system protective agent quality class DQC CB-14. Such claims may not be used for cooling system protective agents which have not been approved.

In the framework of the specifications in TR 0199-99-01228, mixture ratios are permissible for cooling system protective agent as per DQC CB-14 approvals.

2.3 Cooling system protective agent quality class DQC CC-14

Cooling system protective agents in accordance with DEUTZ Cooling system protective agent quality class DQC CC-14 may be approved by DEUTZ if the following specifications have been fulfilled:

- **DQC CC-14** Cooling system protective agents, contains silicate, based on organic acids (OAT) and (MEG)

Cooling system protective agents that correspond with this product group and which have been subject to DEUTZ approval testing and have been approved by DEUTZ in writing may be listed in the data sheets or other publications by the cooling system protective agent manufacturers as complying with cooling system protective agent quality class DQC CC-14. Such claims may not be used for cooling system protective agents which have not been approved.

In the framework of the specifications in TR 0199-99-01228, mixture ratios are permissible for cooling system protective agent as per DQC CC-14 approvals.

3 Release

3.1 General approval process

Required action from the applicant:

- Filling out the form with manufacturer information in accordance with Appendix A for original approvals (DQC CA-14, DQC CB-14 and DQC CC-14) and Appendix B for rebranding or ready-mix approvals (DQC CA-14, DQC CB-14 and DQC CC-14).
- Deviations from the indicated testing specifications must be entered into the corresponding field and marked in red,
- Copies of the original test reports must be included for initial approvals,
- Transmission of the technical data sheets (German and English),
- Transmission of the safety data sheets (German and English),
- Transmission of samples in accordance with the specifications in Table 2,
- Written order with all important commercial details (order number, bank details, billing address etc.).

With his signature the applicant confirms that all the results and data given in the application are correct, that the conditions described in this company standard are accepted and the applicant undertakes to observe the conditions. If the applicant is guilty of specifying incorrect results and data and DEUTZ grants a release for an original, rebranded or ready-mix cooling system protective agent according to this company standard and engine damage is incurred as a result of the quality of the cooling system protective agent, the applicant is obliged to compensate DEUTZ's losses in case of such damage and to release them from third party claims. If the applicant is guilty of violating the conditions of this company standard and DEUTZ incurs damage as a result, the applicant is obliged to compensate DEUTZ for such damages and to release them from claims by third parties.

The applicant will normally only market one product which has been tested and approved by DEUTZ worldwide under one brand name.

In this case the applicant undertakes to sell only one product with this formulation in each country. The applicant undertakes not to make any recommendations concerning use in DEUTZ engines (e.g. with regard to cooling system protective agent change intervals) if these do not comply with the recommendations made by DEUTZ.

The application papers and the cooling system protective agent sample must be sent to the following address:

DEUTZ AG
Mr. Winkler / Mrs. Leyendecker
Engine Oils, Fuels & Laboratory Analysis
Ottostraße 1
51149 Cologne

The forms with manufacturers details, test reports, safety data sheets, technical data sheets and conformity declaration are to be submitted as **one combined** PDF file if possible

lubricants.de@deutz.com

DEUTZ AG is obliged to use all the data provided by the applicant exclusively for their own purposes and for assessment of the release application and to treat the data confidentially.

An approval is valid for a maximum of 3 years from the written validation by DEUTZ and becomes invalid automatically at the end of this period. If the original cooling system protection manufacturer only confirm a shorter period for important reasons, the approval will be limited to a period of 1-3 years if necessary. This does not reduce the fees.

The right to use the DQC mark always expires when the validity expires. The applicant is herewith advised to submit a renewal application in good time. The applicant undertakes to inform DEUTZ in writing of any change of the composition of the cooling system protective agent at least 3 months in advance. If any engine damage is caused by a change in the quality of the cooling system protective agent and the applicant has not advised DEUTZ in advance in writing of such a change by the above-mentioned deadline, the applicant undertakes to compensate DEUTZ for any damage and to release the company from any claims by third parties.

DEUTZ reserves the right to withdraw an approval at any time if there are important reasons. Important reasons in this sense are especially (but not only):

- Any change in the quality of the cooling system protective agent or its composition (base materials or additives) of the cooling system protective agent to which the approval applies,
- Insolvency or imminent insolvency of the cooling system protective agent supplier,
- Improper use of the DEUTZ DQC trade mark.

3.2 Mixing ratio

The following table shows the minimum and maximum concentrations of monoethylene glycol (MEG) permissible in water-cooled diesel engines. Further information can be found in TR 0199-99-01218. The concentrations for approved ready-mix products must be within the mixture ratios in Table 1:

Table 1

Mixing ratio		
Cooling system protection agent	Water	Anti-freeze up to approx.
min. 35 %	65 %	-22 °C
40 %	60 %	-28 °C
45 %	55 %	-35 °C
max. 50 %	50 %	-41 °C

3.3 Requirements for the manufacturer for obtaining approvals

Table 2

Data	Original approval	Rebranding approval	Ready-mix
physical/chemical characteristic data	✓		
Conformity certificate (from the original manufacturer)		✓	✓
freezing point ASTM D 1177	✓	✓	✓
Foam test ASTM D 1881	✓	✓	✓
Glassware test ASTM D 1384-05	✓	✓	✓
Heat transfer test ASTM D 4340-10	✓	✓	✓
Test in accordance with FVV Book R530-2005 <ul style="list-style-type: none"> • Cavitation protection tests • Cavitation tests (ultrasound coupling rocker) • Circulation system with cavitation chamber (knocking chamber) • Corrosion tests with heat flowing through (hot test) 	✓		
Test bench tests (at DEUTZ AG) (Table 3)	✓		
Field tests (at DEUTZ AG) (Table 3)	✓		
Sample	400 Litres* 5 Litres**	10 litres 5 Litres**	10 litres 4 Litre**

*If necessary other quantities after consulting with DEUTZ.

**For extension applications

4 Test bench and field tests

New product applications in accordance with DQC CA-14, DQC CB-14 and DQC CC-14 also require tests on the test bench and field tests. 3 test tracks from different cubic capacity classes are planned.

The test bench and field tests are performed in accordance with the specification SE 01635003 (statistic state and damage assessment).

The scope of the testing is selected by DEUTZ so the aggregates are run with the highest possible engine output. The

parameters for the individual tests on the test bench and the field tests can be found in Table 3.

Table 3

Property	Test bench test	Field tests
	3 engines, of those, each one engine from the cubic capacity class < 4 litres / 4 - 8 litres > / 8 litres	3 engines, of those, each one engine from the cubic capacity class < 4 litres / 4 - 8 litres > / 8 litres
Duration of the test	min. 500 operating hours	1 year (summer/winter operation) and at least 1000 operating hours
Cubic capacity class less than 4 litres	TCD 2.9 L4	TCD 2.9 L4
	TCD 3.6 L4	TCD 3.6 L4
	TCD 4.1 L4	TCD 4.1 L4
Cubic capacity class 4 - 8 litres	TCD 6.1 L4	TCD 6.1 L6
	TCD 7.8 L4	TCD 7.8 L6
Cubic capacity class more than 8 litres	TCD 12.0 V6	TCD 12.0 V6
	TCD 16.0 V8	TCD 16.0 V8

If engines from the respective cubic capacity class are not available during the scheduled testing period, DEUTZ AG reserves the right to perform a modified testing program.

After the test bench tests, DEUTZ (if necessary in cooperation with the cooling system protective agent manufacturer) performs a return diagnostic in accordance with the development specification SE 01635003 (statistic state and damage assessment) and development specification SE 01635089 (engine and components field test) of the engine components (in particular, the functional components to be taken into consideration such as water pumps / CH & CC and application-related hotspots and water-cooled EGR controllers or water-cooled EGTL waste gate controllers).

5 Original approval of cooling system protective agents

Original approvals are products tested by DEUTZ in accordance with this company standard. The composition of the additives and monoethylene glycol (MEG) is always the same within the framework of the manufacturer tolerances. An application in accordance with Appendix A must be submitted for the original approval.

5.1 Approval of rebranded cooling system protective agents

For the purposes of this company standard, a rebranded cooling system protective agent is one which DEUTZ has approved and which is to be resold by the original manufacturer and released under a different brand name. For the approval of a rebranded cooling system protective agent in accordance with DQC CA-14, DQC CB-14 and DQC CC-14, an application in accordance with Appendix B must be submitted as well as a conformity certificate from the original cooling system protective agent manufacturer. This confirms that the cooling system protective agent in the application has already been approved by DEUTZ AG and the original cooling system protective agent manufacturer does not have any objections to the rebranding recipient obtaining a rebranding approval.

5.2 Approval of ready-mix cooling system protective agents

In terms of this company standard, ready-mix cooling system protective agents only include cooling system protective agents that are sold by the original manufacturer and approved and pre-mixed under another brand name. For the approval of a ready-mix cooling system protective agent in accordance with DQC CA-14, DQC CB-14 and DQC CC-14, an application in accordance with Appendix B must be submitted as well as a conformity certificate from the original cooling system protective agent manufacturer. This confirms that the cooling system protective agent in the application has already been approved by DEUTZ AG and the original cooling system protective agent manufacturer does not have any objections to the ready-mix recipient obtaining a rebranding approval.

The concentrations for approved ready-mix products must be within the mixture ratios in Table 1: The water to be used should be distilled or completely desalinated and free of contamination. Minimum requirements for the water to be used can be found in the following table.

Table 4

Analysis values of the fresh water	
pH value at 20 °C	6.5 – 8.5
Chloride-ion content	max. 100 mg/l
Sulphate-ion content	max. 100 mg/l
Total chloride and sulphate-ion content	max. 150 mg/l
Water hardness (ion content of calcium and magnesium)	max. 3.56 mmol/l

5.3 Modification /extension applications

DEUTZ is to be informed immediately of any changes to the recipes or names of approved cooling system protective agents and these are to be notified via an amendment notification. An extension application can be submitted following expiry of the approval period for original approvals, rebranded and ready-mix. The order and a new sample (5 litres) must be sent in with the respective application and the name and DCQ class and the sales areas must be indicated and modifications reported.

If an extension application is not submitted by the cooling system protective agent supplier by the release expiry date, the approval will expire automatically in the month following.

5.4 Release Information

The release given for cooling system protective agent for DEUTZ DQC will be given a written statement released to the cooling system protection industry. The cooling system protective agent brand name in data sheets, publications, and oil containers must line in the release statement exactly with the name of the cooling system protective agent and the DEUTZ cooling system protective agent grade.

A list of currently released lubricating oils is on the Internet at www.deutz.com >> *Service >> Operating Liquids and Additives >> Cooling System Conditioner* published and will be updated on a monthly basis.

5.5 Release fees

A fee will be charged for testing and awarding the approval of the cooling system protective agent as well as for the right to use the DEUTZ DQC mark. For a first application, a letterhead and all the necessary commercial information (such as address, contact person, billing address, bank details, VAT no.) is to be provided in order to grant a business partner code number.

A written release will only be awarded by DEUTZ AG when the appropriate fee has been paid.

The currently applicable fees can be requested from DEUTZ when making an application.

5.6 Use of release by the applicant

Cooling system protective agent manufacturers may list approved cooling system protective agents in data sheets or other publications as complying with cooling system protective agent quality class DQC.

We suggest the following note:

- Approved in accordance with DEUTZ DQC CA-14
- or Approved in accordance with DEUTZ DQC CB-14
- or Approved in accordance with DEUTZ DQC CC-14


or in German:


Freigegeben nach DEUTZ DQC CA-14
or. Freigegeben nach DEUTZ DQC CB-14
or. Freigegeben nach DEUTZ DQC CC-14


Such endorsements are prohibited for unapproved cooling system protective agents because DEUTZ is the sole owner of the word mark DQC.


5.7 Definition of terms

DQC	DEUTZ Quality Class
CA	Cooling system protective agents, contains silicate, based on monoethylene glycol
CB	Cooling system protective agents, does not contain silicates, based on organic acid (OAT) and MEG
CC	Cooling system protective agents, contains silicate, based on organic acids (OAT) and (MEG)
OAT	Organic Acid Technologies
MEG	Monoethylene glycol (1.2 ethandiol)
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
EGR	Exhaust gas return
EGTL	Exhaust gas turbo charger
CH	Cylinder head
CC	Crank casing

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