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# DEUTZ lubricating oil Quality Classes DQC – DEUTZ Quality Class

## High-speed diesel engines, release conditions

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## 1 Scope

This Company Standard sets out the conditions for lubricating oil suppliers for engine oils and additives to be used with high-speed DEUTZ diesel engines. It includes specifications regarding DEUTZ lubricating oil Quality Classes (DQC) as well as the requirements and release procedures.

DEUTZ is the sole owner of the trademark DQC which is protected with the German Department for Patents and Brand Names under file number 304 59 318 and with the Internal Market Harmonization Department under file number 005538905 for all Member States of the European Union. Releases under this company standard are restricted to the non-exclusive right to use the trademark for marking these lubricating oils as per this Company Standard within the scope of marketing of released lubricating oils.

DEUTZ retains all rights and claims regarding the DQC trademark. DEUTZ alone has the right to dispose of the trademark and DEUTZ has the right to decide on the future of the DQC trademark

The pilot sample testing and release is carried out on DEUTZ AG's premises by the department "R&D – oil releases".

## 2 Lubricating oil Quality Classes

The Technical Circular 0199-99-01217 and the operating instructions for the various engine series sets out the required lubricating oil qualities according to DQC for each engine type as well as according to engine output, operating conditions and exhaust gas after-treatment.

Below is a brief description of oil Quality Classes according to DQC and the engines for which they are suitable:

- DQC I-02 Minimum oil quality, some shorter oil change intervals
- DQC II-10 Standard quality, usually used in engines with open crankcase ventilation
- DQC III-10 High performance diesel engine oils, application for engines with closed crankcase ventilation and/or with high thermal loads
- DQC IV-10 Ultra high performance diesel engine oil for engines with highest level of output with closed crankcase ventilation and/or with the highest thermal loads
- DQC II-10 LA **Low-ash** diesel engine oil, standard quality, usually used in engines with open crankcase ventilation
- DQC III-10 LA **Low-ash** high performance diesel engine oil, application for engines with closed crankcase ventilation and/or with high thermal loads
- DQC IV-10 LA **Low-ash** ultra high performance diesel engine oil for engines with highest level of output with closed crankcase ventilation and/or with the highest thermal loads

Engine oils which are released according to higher DQC classes may also be used in the respective lower DQC classes. Oils that have been released according to the current DQC classes DQC II-05, DQC III-05 and DQC IV-05 may continue to be used up to the end of 2013.

Up to the end of 2013 engine oils released according to the respective standard classes DQC II-05, DQC III-05 and DQC IV-05 are allowed to be used also in engines with exhaust gas after-treatment systems when they are marked as "low ash/ low SAPS" in the internet release list.

The low-ash engine oils DQC II-10 LA, DQC III-10 LA and DQC IV-10 LA (based on ACEA E6, ACEA E9, API CJ-4, JASO DH-2) are required especially for engines with particulate filter (diesel particle filter (DPF) or particle oxidation catalytic converter) or for other exhaust gas after-treatment systems such as SCR and/or the diesel oxidation catalytic converter (DOC).

Low-ash oils have a lower TBN (base number) than normal engine oils due to a lower percentage of ash-forming additives and therefore a lower potential for buffering acidic components. These oils should therefore not be used when the sulphur content in the fuel is above 50 mg/kg. However, low-ash lubricating oils may be used up to sulphur contents of 500 mg/kg if the base number (TBN) is  $\geq 9$  mg KOH/g. A corresponding note regarding suitable lubricating oils is published in the DEUTZ release list.

Engine oil properties must not alter during periods of normal storage and must be miscible in any ratio with other engine oils released by DEUTZ. No precipitation, layering or opacity may occur in these mixtures. The engine oils must be free of any solid particles and water.

Engine oils permitted under this standard must not contain any ingredients which are classified as **prohibited** or **undesirable** under VDA Guideline 232-101 or GADSL.

The designation and quantity of ingredients which have to be declared under VDA Guideline 232-101 or GADSL must be shown.

## **2.1 Lubricating oil Quality Class DQC I-02**

Lubricating oils complying with DEUTZ lubricating oil Quality Class DQC I-02 may be released by DEUTZ when the following classification requirements are also complied with:

ACEA E2-96 or API CF or API CF-4 or API-CG-4

Lubricating oils of the Quality Class DQC I-02 that comply with these ACEA or API classifications may be used in DEUTZ engines without requiring a specific DEUTZ release.

Lubricating oils that have been tested in a DEUTZ release test and have been released by DEUTZ in writing may be listed in the data sheets or other publications by the lubricating oil manufacturers as complying with lubricating oil Quality Class DQC I-02. Such claims may not be used for oils which have not been released.

Viscosity classes may include one of the following SAE classes:

0W-30, 5W-30, 10W-30, 15W-30

0W-40, 5W-40, 10W-40, 15W-40

15W-50, 20W-50

(Choice of viscosity class dependent on ambient temperatures)

Single-grade oils are also permissible for DQC I-02 in terms of the TR 0199-99-01217 specifications.

## **2.2 Lubricating oil Quality Class DQC II-10**

Lubricating oils complying with DEUTZ lubricating oil Quality Class DQC II-10 may be released by DEUTZ when following classification requirements are also complied with:

ACEA E3-96 or ACEA E4-12 or ACEA E5-02 or ACEA E7-12 or API CH-4 or API CI-4 or CI-4 Plus or DHD-1 or JASO DH-1

Lubricating oils of the Quality Class DQC II-10 that comply with these ACEA or API classifications may be used in DEUTZ engines without requiring a specific DEUTZ release.

Lubricating oils that have been tested in a DEUTZ release test and have been released by DEUTZ in writing may be listed in the data sheets or other publications by the lubricating oil manufacturers as complying with lubricating oil Quality Class DQC II-10. Such claims may not be used for oils which have not been released.

Viscosity classes may include one of the following SAE classes:

0W-30, 5W-30, 10W-30, 15W-30

0W-40, 5W-40, 10W-40, 15W-40

15W-50, 20W-50

(Choice of viscosity class dependent on ambient temperatures)

Single-grade oils are also permissible for DQC II-10 in terms of TR 0199-99-01217 specifications.

### **2.3 Lubricating oil Quality Class DQC II-10 LA**

Lubricating oils complying with DEUTZ lubricating oil Quality Class DQC II-10 LA may be released by DEUTZ when following classification requirements are also complied with:

ACEA E6-12 or ACEA E9-12 or API CJ-4 or JASO DH-2

Lubricating oils of the Quality Class DQC II-10 LA that comply with these ACEA or API classifications may be used in DEUTZ engines without requiring a specific DEUTZ release.

Lubricating oils that have been tested in a DEUTZ release test and have been released by DEUTZ in writing may be listed in the data sheets or other publications by the lubricating oil manufacturers as complying with lubricating oil Quality Class DQC II-10 LA. Such claims may not be used for oils which have not been released.

Viscosity classes may include one of the following SAE classes:

0W-30, 5W-30, 10W-30, 15W-30

0W-40, 5W-40, 10W-40, 15W-40

15W-50, 20W-50

(Choice of viscosity class dependent on ambient temperatures)

### **2.4 Lubricating oil Quality Classes DQC III-10 and DQC IV-10**

Lubricating oils complying with DEUTZ Quality Class DQC III-10 and DQC IV-10 may be released by DEUTZ when the relevant release requirements have been fulfilled.

The requirements for DQC III-10 and DQC IV-10 oils are listed in Appendix B. The in some cases more stringent limit values compared to actual ACEA specifications have been defined in terms of low turbocharger pollution when using closed crankcase ventilation, as well as for improved oxidation stability under high thermal lubricating oil load.

Viscosity classes may include one of the following SAE classes:

0W-30, 5W-30, 10W-30

0W-40, 5W-40, 10W-40

(Choice of viscosity class dependent on ambient temperatures)

For DQC III-10 the SAE classes 15W-30 and 15W-40 will also be accepted when the specified limit values are fulfilled.

### **2.5 Lubricating oil Quality Classes DQC III-10 LA and DQC IV-10 LA**

Lubricating oils complying with DEUTZ Quality Class DQC III-10 and DQC IV-10 may be released by DEUTZ when the relevant release requirements have been fulfilled.

The requirements for DQC III-10 LA and DQC IV-10 LA oils are listed in Appendix B. The in some cases more stringent limit values compared to actual ACEA specifications have been defined with regard to low turbocharger pollution when using closed crankcase ventilation, as well as to improved oxidation stability under high thermal lubricating oil load.

Viscosity classes may include one of the following SAE classes:

0W-30, 5W-30, 10W-30

0W-40, 5W-40, 10W-40

(Choice of viscosity class dependent on ambient temperatures)

For DQC III-10 LA the SAE classes 15W-30 and 15W-40 will also be accepted when the specified limit values are fulfilled.

### 3 Release

#### 3.1 General release procedure

Required action from the applicant:

- Completing the form with manufacturer's details as set out in Appendix A for DQC I-02, DQC II-10 or DQC II-10 LA or as set out in Appendix B for DQC III-10, DQC IV-10, DQC III-10 LA and DQC IV-10 LA, or Appendix C for rebrand releases.
- If a different method of measurement from that given in the template is used for a certain measured value, this must be entered in the relevant field and marked in red.
- Test bench results for CEC and ASTM test methods are only recognized if they have accreditation by DIN EN ISO/IEC 17025 or the ASTM Test Monitoring Centre and proof of regular successful participation in round-robin tests can be provided. Only independent test bench laboratories (e.g. APL and ISP) and test bench laboratories of the additive producers are permissible.
- Results of laboratory tests are recognized if the testing laboratory has DIN EN ISO/IEC 17025 accreditation and has participated successfully in inter-laboratory tests. The relevant certifications are to be provided if requested.
- Only test results from the following test laboratories are accepted for the deposit test according to DIN 51535:

APL Automobil-Prüftechnik Landau GmbH Am Hölzel 11 D-76829 Landau, Germany	ISP Salzbergen GmbH & Co. KG Neuenkirchener Straße 7 D-48499 Salzbergen, Germany
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- Copies of the original test reports (engine and laboratory tests) are to be provided for the initial release and for trade package releases.
- Submission of the lubricating oil data sheet (not for trade package releases).
- Submission of the safety data sheet (not for trade package releases).
- Infra red spectrum of the lubricating oil (only for DQC III-10 or DQC IV-10 or DQC III-10 LA or DQC IV-10 LA).
- Submission of a lubricating oil sample (1 litre), supplied in HDPE bottles.
- 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 is obliged to observe the conditions. If the applicant is guilty of specifying incorrect results and data and DEUTZ grants a release for an original, rebled or rebranded oil according to this Company Standard and engine damage is incurred as a result of the oil quality, 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 released by DEUTZ worldwide under one brand name. The oil code will indicate clearly the identity of the engine oil here. In exceptional cases, the applicant may market different formulations in different countries under the same product designation with different oil codes, provided DEUTZ has tested and released each formulation. 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 oil change intervals, viscosity classes etc.) if these do not comply with the recommendations made by DEUTZ.

The application papers and the oil sample must be sent to the following address:

**DEUTZ AG**  
**Mr. Winkler / Mrs. Leyendecker**  
**R&D - Laboratory Analysis**  
**Ottostr. 1**  
**D-51149 Cologne, Germany**

The forms with manufacturer details, test reports, safety data sheets and IR spectrum are to be submitted when possible as **one combined** PDF file to

**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.

A release is valid for 3 years from the written validation by DEUTZ and becomes invalid automatically at the end of this period. The right to use the DQC mark always expires when the validity expires. The applicant is 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 oil at least 3 months in advance. If any engine damage is caused by a change in the quality of the lubricating oil 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 a release 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 lubricating oil or its composition (base oil or additives) of the engine oil to which the release applies,
- Insolvency or imminent insolvency of the lubricating oil supplier.
- Improper use of the DEUTZ DQC trade mark.

Should the composition of an oil be changed, the release process for the changed oil will be the same as for a first or reblend release.

### **3.2 Package and original release of oils**

Package releases in the sense of this Company Standard refer to additive packages of additive manufacturers which are used for different viscosity classes and different oil manufacturing, whereby the additives for this are often modified slightly. Modifications both to the basic oils and the additives are only permissible insofar as they are described according to Base Oil Interchange (BOI), Viscosity Grade Read Across (VGRA) and Minor Modification Rules in the ATIEL/ATC Code of Practice as well as in API 1509 and in the ACC Code of Practice. The described modifications apply both with regard to the transferability of the package release to oils for which the oil manufacturer refers to the package release of the additive manufacturer and with regard to the validity of engine test results in slightly varied oil compositions. Original releases in the sense of this Company Standard refer to the original oils that are not for package release. For package and original releases, Appendix A or B require completion.

### **3.3 Release of reblended oils**

A reblended oil in the sense of this Company Standard refers to an oil already released by DEUTZ which has been made by another manufacturer according to the same recipe (base oil and additives). For reblended oil releases, Appendix A or B require completion.

### **3.4 Release of rebranded oils**

For the purposes of this Company Standard, a rebranded oil is one which DEUTZ has released and which is to be resold by the original manufacturer and released under a different brand name.

For the release of a rebranded oil under DQC III-10, DQC IV-10, DQC III-10 LA or DQC IV-10 an application as in Appendix C must be submitted as well as a confirmation from the original manufacturer of the lubricating oil confirming that the oil for which the release is applied for is a rebrand of an oil which has already been released by DEUTZ AG and that the original or rebled oil manufacturer has no objections against the rebrandee obtaining a rebrand release.

### **3.5 Amendment notification/ extension application**

DEUTZ is to be informed immediately of any changes to the recipes or names of released oils and these are to be notified via an amendment notification.

An extension application can be submitted following expiry of the release period for trade packages, rebled, rebranded and original released oils. A written application is required along with the name, oil code, DQC class, viscosity class, sales region and information on any amendments.

If an extension application is not submitted by the oil supplier by the release expiry date, the release will expire automatically in the month following. Any subsequently submitted release application will then be treated as a first application. For commercial package releases, rebled or rebranded releases are then no longer possible.

### **3.6 Release for rebled and rebranded oils as well as amendment notifications / extension requests on the basis of existing releases with the year reference DQC XX-05**

Extension applications for DQC XX-05 releases, as well as rebled and rebrand releases based on DQC XX-05 releases, will continue to be possible but will proceed with different year reference numbers (e.g.: DQC III-10 instead of DQC III-05). Low-ash engine oils will receive the added abbreviation LA (e.g.: DQC III-05 low ash / low SAPS → DQC III-10 LA).

### **3.7 Release information**

The release for lubricating oils according to DEUTZ DQC is in the form of a written release declaration given to the lubricating oil manufacturer. The lubricating oil brand name in data sheets, publications and oil containers must exactly match the name of the lubricating oil and the DEUTZ lubricating oil quality class in the release declaration.

A list of the currently released lubricating oils is published on the Internet under

*[www.deutz.com](http://www.deutz.com) – Service - Operating Liquids and Additives – Deutz Quality Class*

and updated usually on a monthly basis.

### **3.8 Release fees**

A fee will be charged for testing and awarding the release 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.

### 3.9 Use of release by the applicant

Lubricating oil manufacturers may list released lubricating oils in data sheets or other publications as complying with lubricating oil Quality Class DQC.

We suggest the following remark:

or **DEUTZ DQC IV-10 approved**  
**DEUTZ DQC IV-10 LA approved**

or in German:

or **Freigegeben nach DEUTZ DQC IV-10**  
**Freigegeben nach DEUTZ DQC IV-10 LA**

**Such endorsements are prohibited for non-released oils** due to DEUTZ being the sole owner of the DQC trademark.

### 3.10 Definition of terms

DQC	DEUTZ Quality Class
DOC	Diesel oxidation catalytic converter
DPF	closed diesel particle filter
SCR	selective catalytic reduction (nitrogen oxide (NO <sub>x</sub> ) reduction via ammonia through adding a water-urea solution (Adblue® / DEF / AUS 32)
VDA 232-101	Global list of declarable substances in automobile manufacture
GADSL	Global Automotive Declarable Substance List ( <a href="http://www.gadsl.org">http://www.gadsl.org</a> )

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 Datum, VE-PS1, Markus Winkler

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 Datum, VE-GS, Thomas Kaiser

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 Datum, VE-VQ, Alexander Jakubeit

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 Datum, VE-GM, Harald Steppat

*Descriptors: engine oil, DQC, mineral oil*

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