

DEUTZ Lubricating Oil Quality Classes 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 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 DQC trademark, which is protected by the German Department for Patents and Brand Names under file number 304 59 318. Furthermore, trademarks are protected in all countries of the European Union, in the USA, Canada and in China. 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 "R&D – engine oils, fuels and chemical analysis" department.

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.

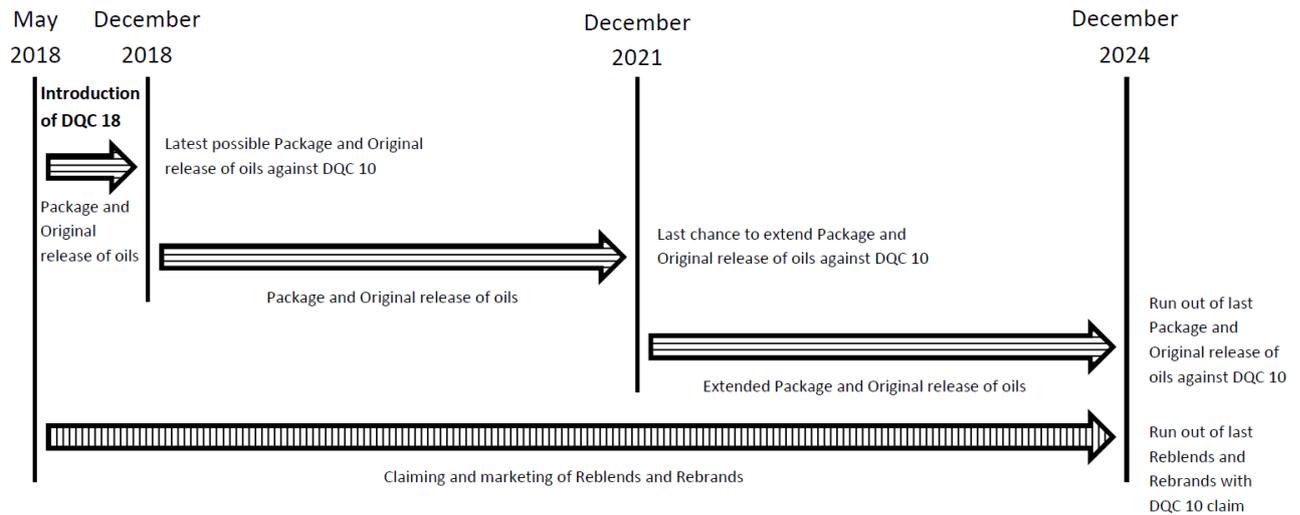
Below is a brief description of oil Quality Classes according to DQC and the engines for which they are suitable:

- DQC I-02 Minimum oil quality, some shorter oil change intervals
- DQC II-18 Engine oil, usually used in engines with open crankcase ventilation
- DQC III-18 Standard quality, high performance diesel engine oils, for use in engines with closed crankcase ventilation and/or with high thermal loads
- DQC IV-18 Ultra high performance diesel engine oils for engines with the highest levels of output with closed crankcase ventilation and/or the highest thermal loads or very high requirements for piston cleanliness
- DQC II-18 LA **Low-ash** engine oil, usually used in engines with open crankcase ventilation
- DQC III-18 LA **Low-ash** high performance diesel and gas engine oils, standard quality, for use in engines with closed crankcase ventilation and/or with high thermal loads
- DQC IV-18 LA **Low-ash** ultra high performance diesel and gas engine oil for engines with the highest levels of output, with closed crankcase ventilation and/or the highest thermal loads or very high requirements for piston cleanliness (suitable for TTCD steel piston engines) and longer oil change intervals

Engine oils which are released according to higher DQC classes may also be used in the respective lower DQC classes.

Original or package releases according to the DQC classes DQC II-10, DQC III-10, DQC IV-10, DQC II-10 LA, DQC III-10 LA and DQC IV-10 LA can be newly registered up until 31.12.2018. From 01.01.2019 only original and package releases will be released according to the new specification, DQC X-18 (LA).

Original and package releases released up to now can be extended for the last time up to 31.12.2021, so that they expire on 31.12.2024 at the latest. Reblend and rebrand releases for oil formulations of the classes DQC X-10 (LA) from released original and package releases can be registered at any time and expire automatically 3 years after being registered, but on 31.12.2024 at the latest. A reblend or rebrand release can only be extended if there is an original or package release in the corresponding time frame (see A 1).



A 1 Transitional arrangement from DQC X-10 (LA) to DQC X-18 (LA)

The low-ash engine oils DQC II-18 LA, DQC III-18 LA, DQC IV-18 LA (based on ACEA E6, ACEA E9, ACEA E8, ACEA E11, API CJ-4, API CK-4 or JASO DH-2) are required for engines with diesel particle filters (DPF), SCR systems or diesel oxidation catalysts (DOC) and combinations of these exhaust after-treatment systems as well as for gas engines (e.g. LPG).

Due to the lower percentage of ash-forming additives, low-ash oils have a lower TBN (base number) than normal engine oils and therefore a lower potential for neutralising 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 a sulphur content of 500 mg/kg if the base number (TBN) is ≥ 9 mg KOH/g. A corresponding note regarding suitable lubricating oils is published in the DEUTZ release list.

The DQC classes described above also apply to engines or devices that are operated in water conservation areas or that for other reasons have to use engine oil with increased biodegradability. The engine oil must fulfil the performance of the respective DQC class but in addition it must be proved that the biodegradability is $> 60\%$ according to OECD 301B. In addition, the water hazard class WGK 1 and the minimum content of renewable raw materials of $> 25\%$ according to EN 16807 must be complied with. Engine oils which have been released for use in water conservation areas are identified on the DQC release list with the addition of "biodegradable".

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 respectively GADSL.

The designation and quantity of ingredients which have to be declared under VDA Guideline 232-101 respectively GADSL must be declared on a separate sheet during the release process.

At the same time, all current requirements for the REACH ordinance must be complied with.

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 or ACEA E3 or ACEA E5 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-18

Lubricating oils complying with DEUTZ lubricating oil Quality Class DQC II-18 may be released by DEUTZ when the following classification requirements are also complied with:

ACEA E4 or ACEA E7 or API CH-4 or API CI-4 or CI-4 Plus or DHD-1 or JASO DH-1

Lubricating oil of the Quality Class DQC II-18 which complies 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-18. 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-18 in terms of the TR 0199-99-01217 specifications.

2.3 Lubricating oil Quality Class DQC II-18 LA

Lubricating oils complying with DEUTZ lubricating oil Quality Class DQC II-18 LA may be released by DEUTZ when the following classification requirements are complied with:

ACEA E6 or ACEA E9 or ACEA E8 or ACEA E11 or API CJ-4 or API CK-4 or JASO DH-2

Lubricating oils of the Quality Class DQC II-18 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-18 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-18 and DQC IV-18

Lubricating oils complying with DEUTZ Quality Class DQC III-18 and DQC IV-18 may be released by DEUTZ when the relevant release requirements have been fulfilled.

The additional requirements for DQC III-18 and DQC IV-18 oils are listed in Appendix B. The requirements, some of which are higher than those of current ACEA guidelines, have been defined with regard to low turbocharger pollution when using closed crankcase ventilation and 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-18 the SAE classes 15W-30 and 15W-40 will also be accepted if the specified limit values are undershot.

2.5 Lubricating oil Quality Classes DQC III-18 LA and DQC IV-18 LA

Lubricating oils complying to DEUTZ Quality Class DQC III-18 LA and DQC IV-18 LA may be released by DEUTZ when the relevant release requirements have been fulfilled.

The requirements for DQC III-18 LA and DQC IV-18 LA oils are listed in Appendix C. The requirements, some of which are higher than those of current ACEA guidelines, have been defined with regard to low turbocharger pollution when using closed crankcase ventilation and 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-18 LA the SAE classes 15W-30 and 15W-40 are also accepted if the specified limit values are undershot.

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-18 or DQC II-18 LA, as set out in Appendix B for DQC III-18 or DQC IV-18, as set out in Appendix C for DQC III-18 LA or DQC IV-18 LA, Appendix D for rebrand releases or Appendix E for reblend 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 from CEC and ASTM test methods are only recognized if they have accreditation according to ISO/IEC 17025 or from the ASTM Test Monitoring Center and proof of regular successful participation in round-robin tests can be provided. Only independent test laboratories are permitted (e.g. APL Automobil-Prüftechnik Landau GmbH, ISP Salzbergen GmbH & Co. KG, Southwest Research Institute, Intertek Group plc).
- Results of laboratory tests are recognized if the testing laboratory has ISO/IEC 17025 accreditation and has participated successfully in inter-laboratory tests. The relevant certifications are to be provided if required.
- 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

- Copies of the original test reports (engine and laboratory tests) are to be provided for the initial release and for commercial product releases.
- Submission of the lubricating oil data sheet (not for commercial product releases).
- Submission of the safety data sheet (not for commercial product releases).
- Submission of the DEUTZ support letter (only for reblend and rebrand releases, see specifications on the next page).
- Infrared spectrum of the lubricating oil (only for DQC III-18 or DQC IV-18 or DQC III-18 LA or DQC IV-18 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.).
- Submission of the completed and signed form to the DEUTZ accounting department, which was previously sent by DEUTZ (only for new customers or in the event of a change of company address (name, address, transfer, etc.), which must be communicated to DEUTZ AG in advance).

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 providing incorrect results and data and DEUTZ grants a release for an original, reblended 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 specifications made by DEUTZ.

Sample template DEUTZ support letter for reblend approvals (to be submitted by additive manufacturers (for reblends) or oil manufacturers (for rebrands) to DEUTZ AG).

For a rebrand release, the oil manufacturer and its oil code must be indicated in the template instead of the additive manufacturer and the oil code of the additive manufacturer.

Address of the additive or oil manufacturer
Including contact person

Date

DEUTZ AG
Mr Winkler / Ms Leyendecker
R&D – Laboratory Analysis
Ottostraße 1
D-51149 Cologne, Germany
Phone: +49 (0)221 / 822 - 4590 / - 4539
Fax: +49 (0)221 / 822 - 15 - 4590
Email: winkler.m@deutz.com

DEUTZ support letter

This is to confirm that “NAME OF THE ADDITIVE OR OIL MANUFACTURER” fully supports the DEUTZ approval application for the product listed below:

Applicant's name	Applicant's brand name	Oil code of the manufacturer	SAE vis grade	DEUTZ performance level	DEUTZ approval type

“NAME OF THE APPLICANT” is responsible for supplying of a sample and the payment of the release fees if applicable.

Contact details:
Applicant address
Including contact person

Signature of the representative of the additive or oil manufacturer

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

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

The forms with manufacturers details, test reports, safety data sheets and IR spectrum are to be submitted electronically, if 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 after it has been issued in writing by DEUTZ and becomes invalid automatically at the end of this period. The right to use the DQC trademark always expires when the validity expires. The applicant is advised to submit a renewal application in good time.

If the original or package release of an oil formulation according to DQC classes DQC III-18, DQC IV-18, DQC III-18 LA or DQC IV-18 LA expires, all reblend and rebrand releases based on this oil formulation also expire automatically at this time. Here, the additive or oil manufacturer is obliged to inform its customers about the status of the DQC oil release.

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 to the 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 from additive manufacturers, which are used for the manufacture of different viscosity classes and different oils, 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, B or C must be completed.

3.3 Release of rebleded oils

A rebleded 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 rebleded oil releases, Appendix D must be completed.

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 according to DQC III-18, DQC IV-18, DQC III-18 LA or DQC IV-18 an application in accordance with Annex E must be submitted. Additionally, a confirmation of the original oil manufacturer must be submitted, which confirms that the oil being submitted is an oil already approved by DEUTZ AG and that the original or rebleded lubricating oil manufacturer has no objections to the rebrand approval being obtained by the rebrand recipient (see example on page 7).

3.5 Alteration/extension applications

DEUTZ AG must 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, rebleded, 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. Subsequently submitted release applications are treated as original or commercial product applications. Reblend and rebrand releases are not possible for such deleted original or commercial product releases.

3.6 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 - Service - Maintenance - Operating Liquids - Oils - Deutz Quality Class

and updated usually on a monthly basis.

3.7 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 sample template can be found in the document "DQC release fees".

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

3.8 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 endorsement: **Freigegeben nach DEUTZ DQC IV-18**
 or **Freigegeben nach DEUTZ DQC IV-18 LA**

Or in English: **DEUTZ DQC IV-18 approved**
 or **DEUTZ DQC IV-18 LA approved**

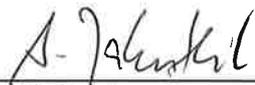
Such endorsements are prohibited for non-released oils due to DEUTZ being the sole owner of the DQC trademark.

3.9 Definition of terms

DQC	DEUTZ Quality Class
DOC	Diesel oxidation catalytic converter
DPF	closed diesel particle filter
SCR	selective catalytic reduction (nitrogen oxide (NO _x) reduction via ammonia through adding
VDA 232-101	Global list of declarable substances in automobile manufacture
GADSL	Global Automotive Declarable Substance List (http://www.gadsl.org)
REACH	Regulation concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals

^{1.A.}
~~21.08.2018~~ 
 Date, VE-TA1, Markus Winkler

~~20.08.18~~ ^{1.A.} 
 Date, VE-G, Dr.-Ing. Felix Ring

~~09.08.18~~ 
 Date, VE-SQ, Alexander Jakubeit

~~17.08.18~~ 
 Date, VE-GS, Dr.-Ing. Jörg Thiemann

Descriptors: engine oil, DQC, mineral oil

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