
**Diesel engines — NO_x reduction agent
AUS 32 —**

**Part 2:
Test methods**

Moteurs diesel — Agent AUS 32 de réduction des NO_x —

Partie 2: Méthodes d'essai

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 34, *Propulsion, powertrain and powertrain fluids*.

This second edition cancels and replaces the first edition (ISO 22241-2:2006), which has been technically revised. It also incorporates the Technical Corrigendum ISO 22241-2:2006/Cor. 1:2008. The main changes compared to the previous edition are as follows:

- Major revisions to test methods of [Annex C](#) and [Annex I](#),
- Precision values for all test methods were revised,
- [Annex K](#) was updated.

A list of all parts in the ISO 22241 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Diesel engines — NO_x reduction agent AUS 32 —

Part 2: Test methods

WARNING — The use of this document can involve hazardous materials, operations and equipment. This document does not purport to address all the safety issues associated with its use. It is the responsibility of users of this document to respond appropriately to ensure the safety and health of personnel prior to application of the document.

1 Scope

This document specifies test methods required for determination of the quality and chemical characteristics of NO_x reduction agent AUS 32 (aqueous urea solution) as specified in ISO 22241-1.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 4259 (all parts), *Petroleum and related products — Precision of measurement methods and results*

ISO 12185, *Crude petroleum and petroleum products — Determination of density — Oscillating U-tube method*

ISO 22241-2:2019

https://standards.iso.org/iso-22241-2-2019

ISO 17034, *General requirements for the competence of reference material producers*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 22241-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1 certified reference material CRM

substance or material used to check the quality and metrological traceability of products, to validate analytical measurement methods or for the calibration of instruments

4 Specifications

Conformance with the limits specified in ISO 22241-1 shall be determined by the test methods specified in [Annexes B](#) through [I](#) of this document. If necessary, the identity of the product can be determined as specified in [Annex J](#).

5 Sampling

Samples shall be taken in accordance with [Annex A](#).

6 Precision and dispute

Each of the test methods specified in [Annex B](#) through [Annex I](#) include a precision statement using guidance from ISO 4259 (all parts). In cases of dispute, the procedures described in ISO 4259 (all parts) shall be used for resolving the dispute, and interpretation of the results based on the test method precision shall be used.

For the convenience of the user, the respective precision data are summarized in Table K.1.

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Annex A

(normative)

Sampling

A.1 General

The sampling method specified in this annex is valid for each sampling of AUS 32 throughout the supply chain after the shipment from the manufacturer's site to the AUS 32 containers of the vehicles.

A.2 Principle

The limits for the quality characteristics of AUS 32, which are specified in ISO 22241-1, are the representative analytical results that can only be obtained when the sample is protected from any contamination before the analysis.

Therefore, suitable bottles shall be used for sampling, which do not contaminate the sample, especially regarding the trace elements.

NOTE The sampling method specified in this annex is based on ISO 5667-3.

A.3 Possible contaminants

During the sampling process, foreign matter can lead to contamination of the sample. Under realistic conditions, the following sources of contamination will pose a major hazard:

- residues of process aids used for the production of the sampling bottles;
- contaminants which have been deposited in the empty bottles during the time they are stored empty;
- contaminants from the air, i.e. dust or any foreign matter from the surrounding, during the sampling;
- residues of cleaning agents, which have been used for cleaning the sampling equipment and the bottles as well;
- fuel.

A.4 Apparatus

A.4.1 Sampling bottles.

1 000-ml wide neck bottles shall be used. Suited materials for these bottles are high density polyethylene (HDPE), high density polypropylene (HDPP), polyvinylidene fluoride (PVDF) and perfluoroalkoxy alkane (PFA).

Prior to the first use with AUS 32, the bottles shall be cleaned and finally rinsed with deionized water followed by AUS 32.

A.4.2 Labels.

Each bottle shall be labelled using labels of approximately 10 cm by 5 cm. The labels and the writing on these labels shall be resistant to water and to AUS 32.