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

**Part 5:
Refilling interface for passenger cars**

Moteurs diesel — Agent AUS 32 de réduction des NO_x —

Partie 5: Interface de remplissage pour voitures particulières

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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 of 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*. <https://standards.iteh.ai/catalog/standards/sist/b41b28dd-0b4f-4538-a217-19f1b15d1f10>

This second edition cancels and replaces the first edition (ISO 22241-5:2012) which has been technically revised.

The main changes compared to the previous edition are as follows:

- the definition of AUS 32 has been deleted as it is included in ISO 22241-1 and the document is cited normatively;
- new definitions have been added;
- new normative references have been added;
- [Table 1](#) has been editorially and technically revised.

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.

Introduction

The refilling system specified in this document has been developed in accordance with passenger vehicle manufacturer's specifications. The functional requirements include a filling system that has minimal obtrusive odours, has minimal spill risk, limits pressure build-up and includes mismatch prevention. The system should be designed to prevent the deleterious effects of AUS 32, including, but not limited to, uncontrolled flow into gaps in body work with the potential to cause corrosion, smell nuisance and crystal formation.

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Diesel engines — NO_x reduction agent AUS 32 —

Part 5: Refilling interface for passenger cars

1 Scope

This document applies to diesel engine powered road vehicles using selective catalytic reduction (SCR) technology. It is primarily intended for use by passenger cars and light commercial vehicles including buses with a gross vehicle mass of not more than 3,5 t, but can also be used by vehicles with a gross vehicle mass of over 3,5 t.

This document specifies the refilling interface for the NO_x reduction agent AUS 32 in conformance with ISO 22241-1, which is needed to operate converters with selective catalytic reduction (SCR) exhaust treatment system. This document specifies the essential functional and geometric requirements of the refilling system in order to ensure compatibility between the on-board refilling system and the off-board refilling system.

For light commercial vehicles and buses having a gross vehicle mass of not more than 3,5 t, the open refilling system specified in ISO 22241-4 can be used.

NOTE Throughout this document, the term “NO_x reduction agent AUS 32” is abbreviated to “AUS 32”.

2 Normative references

ISO 22241-5:2019

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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 2575, *Road vehicles — Symbols for controls, indicators and tell-tales*

ISO 22241-1, *Diesel engines — NO_x reduction agent AUS 32 — Part 1: Quality requirements*

ISO 22241-3, *Diesel engines — NO_x reduction agent AUS 32 — Part 3: Handling, transportation, and storage*

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:

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

3.1

refilling system

off-board system and on-board system including their refilling interface for dispensing AUS 32 into the on-board tank of the vehicles

3.2

canister bottle

container of size one to ten litres capacity, with spout, used to refill the on-board tank of the vehicle

3.3 off-board refilling system

stationary equipment for dispensing AUS 32 into the on-board tank of the vehicles, consisting typically of storage tank, pump, hose and *filler nozzle* (3.5)

3.4 on-board refilling system

equipment of the vehicles necessary for refilling AUS 32 and consisting typically of *filler neck* (3.6), *filler cap* (3.7) and on-board tank

3.5 filler nozzle

interfacing part of an *off-board refilling system* (3.3) which allows the operator to control the flow of AUS 32 during the filling, consisting of a nozzle spout with a defined interface geometry and an automatic shut-off system

3.6 filler neck

interfacing part of the *on-board refilling system* (3.4)

3.7 filler cap

part fitted to the *filler neck* (3.6) to prevent spillage as well as to minimize contamination of AUS 32 and which is temporarily opened or removed for refilling

3.8 spillage

quantity of fluid that escapes from the *filler nozzle* (3.5) to the atmosphere after the nozzle has shut off

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4 Requirements

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4.1 Functional requirements

The on-board refilling system and the off-board refilling system shall comply with the following basic functional requirements:

- minimal spillage;
- minimal smell nuisance;
- minimal pressure; and
- mismatching prevention.

The detailed requirements specified in [Table 1](#) apply.

Details not specified are left to the manufacturer's choice.

Table 1 — Basic functional requirements

No.	Characteristic	Requirement	Remark
1	Maximum flow rate range	5 l/min ≤ x ≤ 10 l/min.	Flow rates do not apply to: <ul style="list-style-type: none"> — canister filling; — production line filling.

Table 1 (continued)

No.	Characteristic	Requirement	Remark
2	Automatic shut-off of filler nozzle	Automatic shut-off feature required. The maximum amount of flow after automatic stop shall be not more than 50 ml.	For example, a nozzle in conformance with EN 13012.
3	Maximum filling level in AUS 32 on-board tank	The automatic shut-off system of the nozzle shall be used to protect against filling above maximum level.	High volume expansion of AUS 32 during freezing (approx. 7 %).
4	Spillage	Less than 0,4 ml per refilling with filler neck angle from the horizontal $\geq 30^\circ$.	For test procedure see 5.2
5	Pressure in the filler neck	At five seconds after starting the refilling process, the pressure in the filler neck shall be not more than ± 3 mbar. At the end of refilling process, there shall be ambient pressure in the filler neck.	—
6	Ventilation during refilling	The filler neck shall be used for ventilation of the AUS 32 on-board tank. During refilling, no more than 15 mg/l ammonia concentration should be measured.	For test procedure see 5.3
7	Operational temperature range	-30 °C to + 80 °C for on-board components -20 °C to + 40 °C for off-board components	For specific regions, the temperature range specified may not be sufficient or excessive. In such cases, a wider or more narrow temperature range, representative of that specific region, may be considered.
8	Freezing of AUS 32	Provide protection at the service station in accordance with operational temperature range. Vehicle parts shall be designed to cope with freezing and thawing in accordance with operational temperature range.	AUS 32 freezes at $-11,5$ °C and has a volume increase of approximately 7 %.
9	Misfilling of fuel into the AUS 32 on-board tank	Feature required to prevent dispensing of fuel into the AUS 32 on-board tank.	The geometry of the filler neck specified in Figure 1 is significantly smaller than the filler nozzles for fuel in service; thus misuse is precluded.
10	Misfilling of AUS 32 into the diesel fuel tank	Feature required to prevent dispensing of AUS 32 in the fuel on-board tank. The design and geometry of the filler nozzle shall be such that the insertion of this device in the filler neck of on-board fuel tank is not feasible; thus misuse is precluded. For canister filling such design and geometry is recommended.	—
11	Materials	Materials in contact with AUS 32 shall be compatible with AUS 32 to avoid contamination of AUS 32 as well as corrosion of the devices used.	Suitable materials in accordance with ISO 22241-3 should be selected.

Table 1 (continued)

No.	Characteristic	Requirement	Remark
12	Cleanliness	A high level of cleanliness of all components of the on-board and off-board refilling systems shall be secured during the manufacturing, assembly and installation processes in order to minimize contamination of AUS 32. Regarding cleanliness level for the components of the off-board refilling system, see ISO 22241-3. Cleanliness level for the components of the on-board refilling system shall be agreed between vehicle and component manufacturers, in conformance with state of the art.	—
13	Reliability	The filler neck and the filler cap shall be designed and manufactured to be fully functional for the life of the vehicle as defined by vehicle manufacturers.	—
14	Crystallization ^a	Protection recommended	Contact with air should be minimized.
15	Marking ^a	Symbol as specified in ISO 2575 or equivalent national standard.	Blue is the recommended colour for filler caps.
^a Recommendations only.			

4.2 Filler neck

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<https://standards.iteh.ai/catalog/standards/sist/b41b28dd-0b4f-4538-a217-filler/b41b28dd-0b4f-4538-a217-filler>

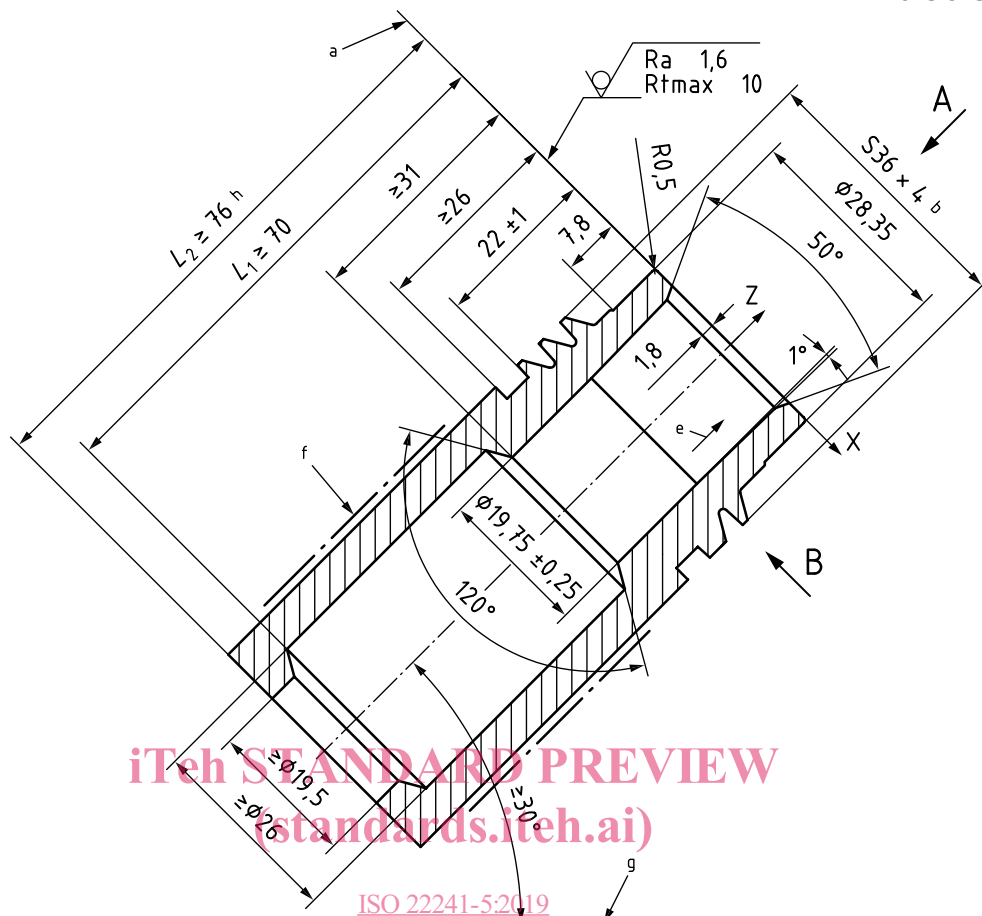
The dimensional characteristics of the filler neck on the vehicle shall be in accordance with the specifications of [Figure 1](#). The interface of the filler neck shall be furnished with a buttress thread S 36 × 4 as specified in [Figure 1](#), [Figure 2](#) and [Table 2](#). The front face of the filler neck shall be designed as sealing surface having a surface finish as specified in [Figure 1](#).

The thread on the filler neck shall withstand a torque of at least 5 Nm.

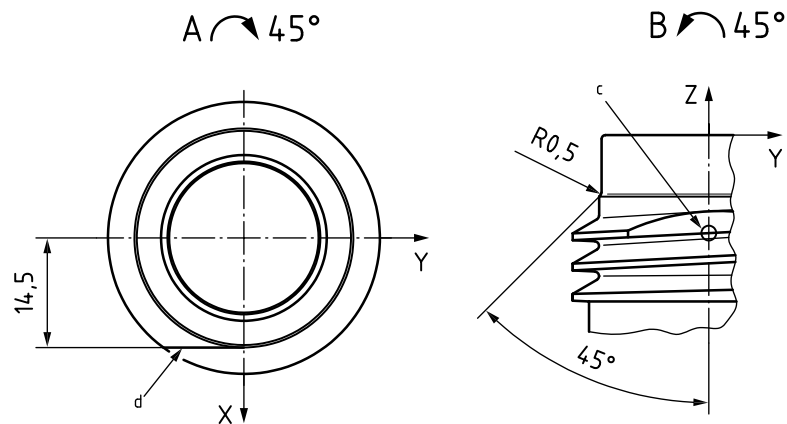
The filler neck designer should be aware of the potential for insufficient venting with nozzle filling. One possibility for a design with improved venting capability is a filler neck with ribs as shown in [Annex A](#).

NOTE Buttress thread: a thread with an asymmetrical ridge that has one straight and one angled flank.

Dimensions in millimetres



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Key

- a Top surface of filler neck.
- b Nominal dimension for thread details see [Figure 2](#) and [Table 2](#).
- c Thread reference point at Y-Axis 0,0 mm at $\phi 29,0$ mm for measuring point for start of thread on Z-Axis.
- d Position of surface thread start surface to adjust at six o'clock position.
- e Venting of internal vapour through the filler neck.