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**Diesel engines — NO<sub>x</sub> reduction agent  
AUS 32 —**

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

*Moteurs diesel — Agent AUS 32 de réduction des NO<sub>x</sub> —*

*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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 22241-5 was prepared by Technical Committee ISO/TC 22, *Road vehicles*, Subcommittee SC 5, *Engine tests*.

ISO 22241 consists of the following parts, under the general title *Diesel engines — NOx reduction agent AUS 32*:

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- *Part 1: Quality requirements* [ISO 22241-5:2012](https://standards.iteh.ai/catalog/standards/sist/156faf51-3a8-4d8e-9eba-0f36692224e0/iso-22241-5-2012)
- *Part 2: Test methods* <https://standards.iteh.ai/catalog/standards/sist/156faf51-3a8-4d8e-9eba-0f36692224e0/iso-22241-5-2012>
- *Part 3: Handling, transportation and storing*
- *Part 4: Refilling interface*
- *Part 5: Refilling interface for passenger cars*

## Introduction

The refilling system specified in this part of ISO 22241 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<sub>x</sub> reduction agent AUS 32 —

## Part 5: Refilling interface for passenger cars

### 1 Scope

This part of ISO 22241 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 may also be used by vehicles with a gross vehicle mass of over 3,5 t.

This part of ISO 22241 specifies the refilling interface for the NO<sub>x</sub> reduction agent AUS 32 in compliance with ISO 22241-1, which is needed to operate converters with selective catalytic reduction (SCR) exhaust treatment system. This part of ISO 22241 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 part of ISO 22241, the term “NO<sub>x</sub> reduction agent AUS 32” is abbreviated to “AUS 32”.

### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 22241-3, *Diesel engines — NO<sub>x</sub> reduction agent AUS 32 — Part 3: Handling, transportation and storing*

### 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

#### 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

container of size 1 to 10 litres capacity, with spout used to refill the vehicle on-board tank

**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 which is 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

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**4 Requirements**

**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;
- 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	Requirements	Remark
1	Flow rate	Not less than 5 Litres per minute Not more than 10 Litres per minute	Flow rates do not apply to — canister filling; — production line filling.
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.	Feature required in compliance with EN 13012 or equivalent standards
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.	
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, not more than 15 ppm ammonia concentration may be measured.	For test procedure see 5.3
7	Operational range	<p><math>-30^\circ\text{C}</math> to <math>+80^\circ\text{C}</math> for components installed on the vehicle</p> <p><math>-20^\circ\text{C}</math> to <math>+40^\circ\text{C}</math> for components at the service station</p> <p>For specific regions, the temperature range specified may not be sufficient. In such a case, a wider temperature range, representative of that specific region, shall be considered.</p> <p>For specific regions, the temperature range specified may be excessive. In such a case, a narrower temperature range, representative of that specific region, may be considered.</p>	
8	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.

Table 1 (continued)

No.	Characteristic	Requirements	Remark
9	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.	
10	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 shall be selected.	
11	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 compliance with state of the art.	
12	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 national regulations or vehicle manufacturers.	
13	Crystallization <sup>REC</sup>	Protection recommended	Contact with air should be minimized.
14	Marking <sup>REC</sup>	See symbol specified in ISO 2575 and see marking specified in ISO 22241-1. Or use equivalent standards.	Blue is the recommended colour for filler caps.
NOTE Characteristics marked <sup>REC</sup> are recommendations only.			

## 4.2 Filler neck

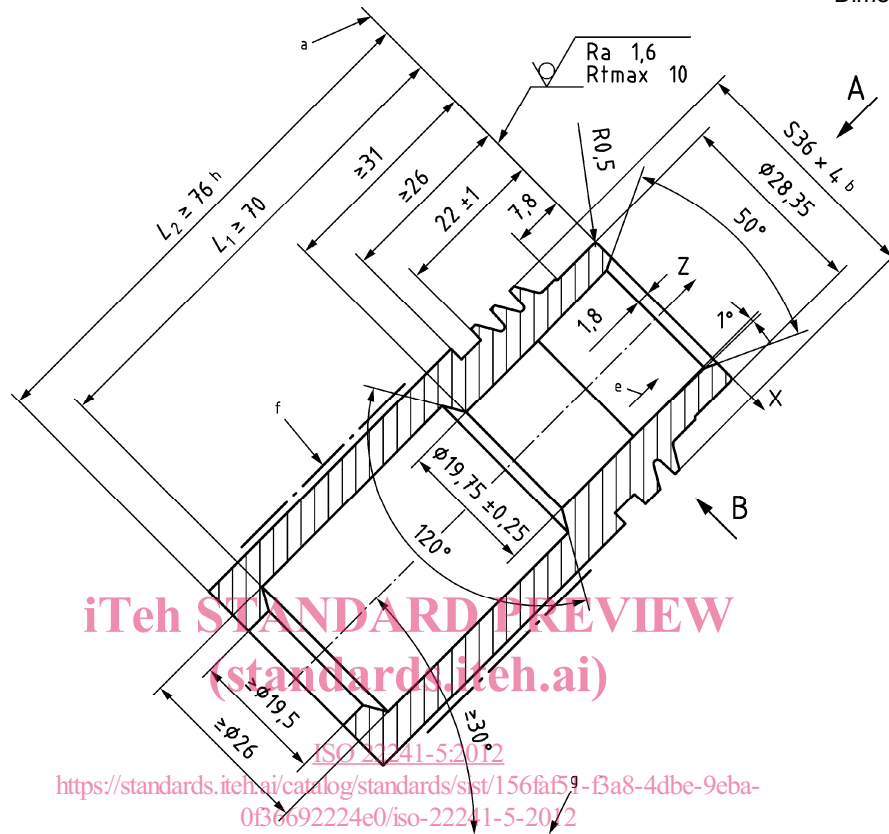
The dimensional characteristics of the filler neck on the vehicle shall be in accordance with the specifications of Figure 1. The interface of the filler neck shall be furnished with a buttress thread S 36 x 4 as specified in Figure 1, Figure 2 and Table 2. The front face of the filler neck shall be 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 vehicle manufacturer 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.

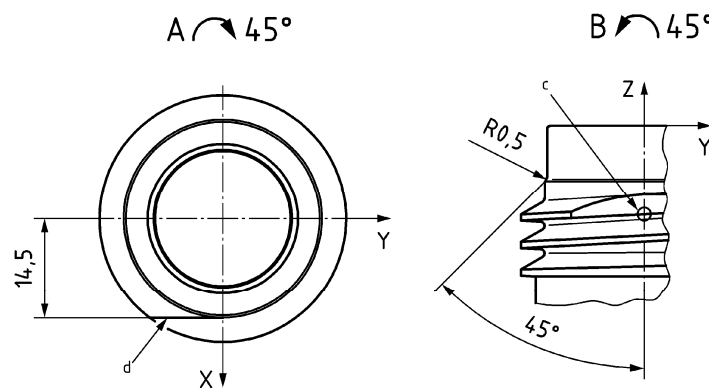
NOTE Buttress thread: a thread with an asymmetrical ridge that has one straight and one angled flank.

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 0,0mm at Ø29,0 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
- f area for venting pipe
- g horizontal line
- h minimum straight portion of filler neck

**Figure 1 — Filler neck**