



**International
Standard**

ISO 22760-3

**Road vehicles — Dimethyl ether
(DME) fuel system components —**

**Part 3:
85% stop valve**

*Véhicules routiers — Composants des systèmes de combustible
Diméthyle Ether (DME) —*

Partie 3: Valve de réservoir 85%

**First edition
2024-05**

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Published in Switzerland

Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Marking	2
5 Design and assembly	2
6 Tests	3
6.1 Applicability.....	3
6.2 Hydrostatic strength.....	3
6.3 Leakage.....	3
6.4 Continued operation.....	4
6.4.1 Cycle durability.....	4
6.4.2 Specific requirements for 85 % stop valves with a float.....	4
6.5 Deformation check.....	4
6.6 Float pressure test.....	4
Bibliography	6

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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 document 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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

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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 41, *Specific aspects for gaseous fuels*.

A list of all parts in the ISO 22760 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.

Road vehicles — Dimethyl ether (DME) fuel system components —

Part 3: 85% stop valve

1 Scope

This document specifies definitions of and general requirements to the 85 % stop valve, intended for use on the types of motor vehicles defined in ISO 3833. It also provides general design principles and specifies requirements for instructions and marking.

This document is applicable to vehicles using gaseous fuels in accordance with ISO 16861. It is not applicable to the following:

- a) fuel containers, except to the extent explicitly referred to in this document;
- b) stationary, ship, railroad vehicle or aircraft dimethyl ether (DME) engine installations;
- c) electronic fuel management;
- d) refuelling receptacles.

NOTE 1 It is recognized that miscellaneous component properties not specifically addressed herein can be examined for compliance with the criteria of any applicable part of the ISO 22760 series, including subjecting the component to the appropriate functional tests.

NOTE 2 All pressures referred to in this document are gauge pressures unless otherwise specified.

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 22760-1, *Road vehicles — Dimethyl ether (DME) fuel system components — Part 1: General requirements and definitions*

ISO 22760-2, *Road vehicles — Dimethyl ether (DME) fuel system components — Part 2: Performance and general test methods*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 22760-1 and the following apply.

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

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

3.1

cut-off valve position

valve state characterized by its flow area being drastically reduced to a minimum

Note 1 to entry: This relates to the 85 % stop valve's cut-off position.

Note 2 to entry: The maximum flow of liquid dimethyl ether through the valve in the cut-off position shall not exceed 0,5 l/min at the differential pressure of 700 kPa.

4 Marking

Marking of the component shall provide sufficient information to allow the following to be traced:

- a) the manufacturer's or agent's name, trademark or symbol;
- b) the model designation (part number);
- c) the working pressure or working pressure and temperature range.

The following additional marking entries are recommended:

- the direction of flow (when necessary for correct installation);
- the type of fuel;
- electrical ratings (if applicable);
- the symbol of the certification agency;
- the type approval number;
- the serial number or date code;
- a reference to this document.

NOTE This information can be provided by a suitable identification code on at least one part of the component when it consists of more than one part.

5 Design and assembly

The 85 % stop valve shall comply with the applicable provisions of ISO 22760-1 and ISO 22760-2, and pass the tests specified in [Clause 6](#) when installed with the fuel container of the size recommended by the valve manufacturer and assembled with the level indicator using the standard installation methods and procedures stipulated by the manufacturer(s) of the equipment. Exemptions from this requirement are allowed only as per specific provisions of this document.

The 85 % stop valve shall comply with the following additional requirements:

- The valve is in the cut-off position when the liquid volume in the container is equal to or above 85 % of the internal geometrical container volume and is in an open position at a lower liquid volume. The tolerance on this value is (+0/-5) % of the internal geometrical container volume. This requirement applies when the spatial position of the fuel container corresponds to the horizontal (both length- and cross-wise) position of a relevant vehicle.
- The liquid volume at which the valve switches positions is within the above-specified tolerance at any filling rate of the fuel container/any differential pressure across the valve, over the entire allowed range of rate/pressure.
- If the valve is electrically operated, it is in the cut-off position at electric power-off.

NOTE Insulation resistance and overvoltage tests are mandatory for electrically operated valves.

6 Tests

6.1 Applicability

The required tests are indicated in [Table 1](#).

Table 1 — Applicable tests

Test	Applicable	Test procedure as required by ISO 22760-2	Specific test requirements of this document
Hydrostatic strength	X	X	X (See 6.2)
Leakage	X	X	X (See 6.3)
Excess torque resistance	X	X	
Bending moment	X	X	
Continued operation	X	X	X (See 6.4)
Corrosion resistance	X	X	
Electrical over-voltage	X	X ^a	
Vibration resistance	X	X	
Brass material compatibility	X	X	
Oxygen ageing	X	X	
Non-metallic material immersion	X	X	
Ozone ageing	X	X	
Resistance to dry heat	X	X	
Insulation resistance	X	X ^a	
Creep	X	X	
Temperature cycle test	X	X	
Deformation check		X ^b	X (See 6.5)
Float pressure test		X	X (See 6.6)
^a Only applicable for electrically operated valves.			
^b To the extent implied by ISO 22760-2.			

6.2 Hydrostatic strength

Test the 85 % stop valve according to the procedure for testing the hydrostatic strength specified in ISO 22760-2. The test pressure shall be 2,25 times the working pressure. The valve does not have to be assembled with the fuel container during the test.

6.3 Leakage

Test the 85 % stop valve at the temperatures and pressures given in [Table 2](#). Since the valve is not to be completely tight in the cut-off position (see [3.1](#)), only test for external leakage as per ISO 22760-2. The valve does not have to be assembled with the fuel container during the test.

Table 2 — Test temperatures and pressures

Temperature °C (±5 °C)	Pressure Factor × working pressure (WP)	
	First test	Second test
-40 or -20	0,75 × WP	0,025 × WP
20	0,025 × WP	2,25 × WP
85	0,05 × WP	

6.4 Continued operation

6.4.1 Cycle durability

The 85 % stop valve shall be tested according to the following procedure:

- Install and connect the 85 % stop valve according to its normal position and function in an intended system.
- Fill the container/test setup with DME until the 85 % stop valve switches from the open position to the cut-off position. Note the actual liquid fuel level in the container. For electrically operated valves, note the reading of the level indicator.
- Measure the filling flow at a differential pressure of 700 kPa while the valve is in the cut-off position. The measured flow must be within the specification (see 3.1).
- Cycle the 85 % stop valve 6 000 times between the fully open and cut-off positions, ensuring that each transition to the cut-off position of the valve begins at the maximum allowed filling flow specified by its manufacturer. Upon completion of the cycling, empty the container well below the level of valve's transition to open state.
- Repeat steps b) and c) twice: first, when the filling flow is set to the minimum allowed; and second, when it is set to the maximum allowed flow. Compare the actual liquid fuel levels (or, for electrically operated valve, the readings of the level indicator) at the transition to the cut-off state with the level noted at the first filling of the tank as per b). The after-cycling levels (readings) shall not be greater than the initial one.

All parts shall remain in position and function properly after this test. Failure in any sense during the procedure shall constitute a failure of the 85 % stop valve.

6.4.2 Specific requirements for 85 % stop valves with a float

An 85 % stop valve that features a float for sensing the liquid level shall, after completion of the tests per 6.4.1, be subjected to the vibration resistance test (see ISO 22760-2) to ensure that the device is constructed to withstand expected dynamic vibrational stresses and that performance degradation or a malfunction will not occur in service. The valve does not have to be assembled with the fuel container during the test.

6.5 Deformation check

No part of the 85 % stop valve, its float or the connection therebetween (when present), shall be visibly deformed, neither under normal conditions of use nor due to subjecting the valve to the specific tests according to this document.

6.6 Float pressure test

If the 85 % stop valve comprises a float, the latter shall withstand an outside pressure of 4 500 kPa. Test as follows:

- place the valve and float assembly in a suitable pressure vessel;
- apply pressure of 4 500 kPa, hold the pressure for 1 min;

ISO 22760-3:2024(en)

— remove the valve, check for deformation.

The valve does not have to be assembled with the fuel container during the test.

Acceptance criteria: no visible deformation nor cracking is allowed.

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