



**International  
Standard**

**ISO 22760-6**

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

**Part 6:  
Pressure relief valve (PRV)**

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

*Partie 6: vannes de contrôle de la surpression*

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ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

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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](http://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](http://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](http://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](http://www.iso.org/members.html).

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

## Part 6: Pressure relief valve (PRV)

### 1 Scope

This document specifies definitions of and general requirements to a pressure relief valve for limiting internal pressure of dimethyl ether (DME) fuel containers intended for use on the types of motor vehicles as 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 for any application other than as noted above;
- b) stationary, ship, railroad vehicle or aircraft DME engine installations;
- c) fuel container mounting hardware;
- d) parts of vehicle fuel systems other than the fuel container;
- e) electronic fuel management;
- f) 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 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 discharge pressure

pressure at which the pressure relief valve begins to open to relieve pressure upstream of valve

Note 1 to entry: This concept is also sometimes referred to as “cracking” or “opening” pressure.

## 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;
- d) the discharge pressure.

The following additional marking entries are recommended:

- the direction of flow (when necessary for correct installation);
- the type of fuel;
- the electrical rating (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 pressure relief valve (PRV) shall comply with the applicable provisions of ISO 22760-1 and ISO 22760-2, and pass the tests specified in [Clause 6](#).

Additional requirements to the design of the PRV and to its assembly with other fuel system components are as follows:

- mounting location of the PRV relative to the fuel container geometry and positioning in use is such that the contact of the PRV inlet with the liquid phase of the fuel is avoided as much as possible;
- discharge pressure is not greater than the working pressure of the DME fuel container.

## 6 Tests

### 6.1 Applicability

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

Table 1 — Applicable tests

Test	Applicable	Test procedure as required by ISO22760-2	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 (See 6.4)
Corrosion resistance	X	X	
Operational test	X		X (See 6.5)
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	
Temperature cycle test	X	X	

## 6.2 Hydrostatic strength

Test the PRV according to the procedure for testing hydrostatic strength specified in ISO 22760-2. The test pressure shall be 2,25 times the working pressure.

The purpose of this test is to check the strength of the PRV housing. If necessary, the movable valve member of the PRV can be blocked shut to achieve the 2,25 times working pressure.

## 6.3 Leakage

Test the PRV at the temperatures and pressures given in Table 2, and otherwise according to the procedure of both the internal and external leakage testing specified in ISO 22760-2.

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	0,75 × WP
85	0,05 × WP	

## 6.4 Continued operation

The PRV shall be capable of withstanding tests according to provisions of the continued operation test procedure given in ISO 22760-2 and the following:

- a) A test cycle consists of, first, pressurizing the PRV to the discharge pressure. This action shall cause the PRV to open and vent. Once the valve is venting, reduce the inlet pressure. When the PRV re-seats, the cycle is finished. Cycle time shall be within a period of 10 s ± 2 s.
- b) Test for 600 continuous cycles.

## 6.5 Operational test

### 6.5.1 General

Verify that the discharge and re-seating pressures of the PRV are within the specification.

### 6.5.2 Test procedure

Three randomly selected samples shall be subjected to the following test procedure. The three steps shall be conducted in the order given. The test medium may be air, nitrogen or DME.

- a) Establish the actual discharge and re-seating pressures for the samples at 20 °C. Do this by first slowly pressurizing the inlet of the sample to 110 % of the working pressure, noting the pressure at which a first indication of flow appears.
- b) Lower the inlet pressure until the PRV flow disappears. Note that value which then represents the re-seating pressure.

The valves are considered to have passed the test above if the following requirements are all met:

- actual discharge pressures are within  $\pm 5$  % tolerance of the manufacturer's advertised discharge pressure;
  - re-seating pressures are no less than 90 % of the actual discharge pressures;
  - re-seating pressures are within  $\pm 5$  % tolerance of the manufacturer's advertised re-seating pressure.
- c) Repeat a) and b) at  $-40$  °C and  $+85$  °C. At each of these test temperatures the following criteria shall be met:
    - actual discharge pressures are no less than 85 % of the discharge pressures recorded for each particular sample during step a) at 20 °C;
    - re-seating pressures are no less than 80 % of the re-seating pressures recorded for each particular sample during step b) at 20 °C;
    - re-seating pressures differ by less than  $\pm 15$  % from the average re-seating pressure.

## 7 Production batch inspection and acceptance testing

The PRV manufacturer shall institute, in addition to the tests required by this document, continuous production batch inspection and acceptance testing that ensure consistent safety-related performance of the final product over its time in production.