

BS ISO 5772:2015



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Rubber and plastic hoses and hose assemblies for measured fuel dispensing systems — Specification

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National foreword

This British Standard is the UK implementation of ISO 5772:2015.

The UK participation in its preparation was entrusted to Technical Committee PRI/66, Rubber and plastics tubing, hoses and hose assemblies.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Second edition
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Rubber and plastic hoses and hose assemblies for measured fuel dispensing systems — Specification

*Tuyaux et flexibles en caoutchouc et en plastique pour distribution
mesurée de carburants — Spécification*



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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 meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#).

The committee responsible for this document is ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 1, *Rubber and plastics hoses and hose assemblies*.

This second edition cancels and replaces the first edition (ISO 5772:1998), which has been technically revised to include the following changes:

- working pressure is 16 bar (1,6 MPa) instead of 12 bar (1,2 MPa) but proof pressure and burst pressure remain the same;
- minimum tensile strength of lining and cover has been increased from 7 MPa to 9 MPa;
- extraction of the lining for low temp hoses has been added and the Low Temperature Bending test is to be done at 25 °C with the force to bend specified;
- hose fuel permeation, flammability, assembly flex test, and assembly leak test have been added.

All the annexes form an integral part of this International Standard.

Rubber and plastic hoses and hose assemblies for measured fuel dispensing systems — Specification

WARNING — Persons using this International Standard should be familiar with normal laboratory practice. This International Standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

1 Scope

This International Standard specifies minimum requirements for three types of hoses in two categories and two classes of hose assemblies used for measured fuel dispensing, including oxygenated fuels (up to a maximum of 15 % oxygenated compounds).

The assemblies are intended for use at ambient temperatures between $-30\text{ }^{\circ}\text{C}$ and $+55\text{ }^{\circ}\text{C}$ for normal temperature class and $-40\text{ }^{\circ}\text{C}$ and $+55\text{ }^{\circ}\text{C}$ for low temperature class at a working pressure up to and including 16 bar (1,6 MPa).

NOTE 1 bar = 0,1 MPa.

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 37, *Rubber, vulcanised or thermoplastic — Determination of tensile stress-strain properties*

ISO 188, *Rubber, vulcanized or thermoplastic — Accelerated ageing and heat resistance tests*

ISO 1307, *Rubber and plastics hoses — Hose sizes, minimum and maximum inside diameters, and tolerances on cut-to-length hoses*

ISO 1402, *Rubber and plastics hoses and hose assemblies — Hydrostatic testing*

ISO 1817, *Rubber, vulcanized or thermoplastic — Determination of the effect of liquids*

ISO 4649, *Rubber, vulcanized or thermoplastic — Determination of abrasion resistance using a rotating cylindrical drum device*

ISO 4671, *Rubber and plastics hoses and hose assemblies — Methods of measurement of the dimensions of hoses and the lengths of hose assemblies*

ISO 6801, *Rubber or plastics hoses — Determination of volumetric expansion*

ISO 7326, *Rubber and plastics hoses — Assessment of ozone resistance under static conditions*

ISO 8031:2009, *Rubber and plastics hoses and hose assemblies — Determination of electrical resistance and conductivity*

ISO 8033, *Rubber and plastics hose — Determination of adhesion between components*

ISO 8330, *Rubber and plastics hoses and hose assemblies — Vocabulary*

ISO 10619-1, *Rubber and plastics hoses and tubing — Measurement of flexibility and stiffness — Part 1: Bending tests at ambient temperature*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8330 apply.

4 Classification

Hoses for this application shall be divided into the following three types:

- a) type 1: textile reinforced;
- b) type 2: textile and helical wire reinforced;
- c) type 3: fine wire reinforced.

Each type of hose shall be divided into the following two temperature classes:

- a) normal temperature class with an ambient working temperature of $-30\text{ }^{\circ}\text{C}$ to $+55\text{ }^{\circ}\text{C}$;
- b) low temperature class (LT) with an ambient working temperature of $-40\text{ }^{\circ}\text{C}$ to $+55\text{ }^{\circ}\text{C}$.

Each type of hose for this application shall be divided into the following two categories:

- a) category M: electrically bonded;
- b) category Ω : electrically conductive.

Hoses for this application shall be divided into the following two temperature classes:

- a) normal temperature class with an ambient working temperature of $-30\text{ }^{\circ}\text{C}$ to $+55\text{ }^{\circ}\text{C}$;
- b) low temperature class (LT) with an ambient working temperature of $-40\text{ }^{\circ}\text{C}$ to $+55\text{ }^{\circ}\text{C}$.

5 Materials and construction

The hose shall consist of the following:

- smooth, fuel resistant lining of rubber or thermoplastic elastomer (TPE);
- suitable reinforcement; related to type;
- non-corrugated, fuel and weather-resistant rubber or TPE cover.

Hose assemblies shall be capable of conducting an electrical charge from coupling to coupling.

When this capability is provided by means of metallic bonding wires, not less than two (metallic) bonding wires shall be embedded in the hose and the metal used shall have a high resistance to fatigue and corrosion.

Hoses with metallic wires for electrical conductivity shall be designated “M” and those using conductive compounds shall be designated “ Ω ”, the relevant mark being branded on the hose (see [Clause 12](#)).

6 Pressure requirements

For all types of hoses, the following shall apply:

- a) maximum working pressure: 16 bar (1,6 MPa);
- b) proof pressure: 24 bar (2,4 MPa);
- c) minimum bursting pressure: 48 bar (4,8 MPa).

7 Dimensions and tolerances

7.1 Internal diameters and bend radii

When measured in accordance with ISO 4671, the internal diameter of the hose shall comply with the values given in [Table 1](#).

When measured in accordance with ISO 10619-1, the minimum bend radii for each diameter of hose shall comply with the values given in [Table 1](#).

Table 1 — Nominal bore, internal diameter, tolerance, and bend radii

Nominal bore	Internal diameter mm	Tolerance mm	Bend radius mm
12	12	±0,8	60
16	16		80
19	19		100
21	21,0	±1,25	130
25	25,0		150
32	32,0		175
35	35,0		200
38	38,0		225
40	40,0		225
50	50,0		275

7.2 Minimum thickness of lining and cover

When measured in accordance with ISO 4671, the thickness of the lining shall not be less than 1,6 mm. The thickness of the cover shall not be less than 1,0 mm.

7.3 Concentricity

When determined in accordance with ISO 4671, the concentricity, based on a total indicator reading between the internal diameter and the outside surface of the cover, shall not exceed 1,0 mm.

7.4 Tolerance on cut lengths

For cut lengths, the tolerances on length shall be according to ISO 1307. The length of a hose assembly shall be measured from sealing face to sealing face of the end fittings with a tolerance from the nominal length of ±1 %.

8 Physical properties

8.1 Compounds

When tested in accordance with the methods in [Table 2](#), the physical properties of the compounds used for the lining and cover shall comply with the values given in [Table 2](#). Tests shall be carried out either on samples taken from the hose or from moulded vulcanised sheets at a thickness of 2 mm or moulded test pieces, vulcanised to the same cured state as the production hoses.

Table 2 — Physical properties of compounds

Property	Unit	Requirement		Test piece ^a	Test method
		Rubber	TPE		
Tensile strength Lining and cover, min.	MPa	9	12	Test piece cut from hose or from test sheet	ISO 37
Elongation at break Lining and cover, min.	%	250	350		
Accelerated ageing — Tensile strength change, max.	%	20	10		ISO 188 (air oven method) 14 days at (70 ± 1) °C
Lining and cover — Elongation at break change, max.	%	–35	–20		
Lining and cover					
Resistance to liquids	%				ISO 1817
Lining swell max.		+70			70 h at 40 °C in oxygenated fuel type 3
		+25			ISO 1817 70 h at 100 °C in oil No 3
Lining extracted matter Normal temperature class max.		+10			ISO 1817 70 h at 40 °C in oxygenated fuel type 3 then dry 24 h at 100 °C
Lining extracted matter Low temperature class max.		+15			
Cover swell max.		+100			ISO 1817 70 h at 23 °C in Liquid B
Low temperature resistance to lining and cover at –30 °C (or –40 °C if required)	—	No cracks under ×10 magnification		Annex A	
Abrasion resistance Cover compound max.	mm ³	500		Test piece from moulded test sheet of cover compound	ISO 4649 Method A

^a It is necessary that the test report indicated the source of the test piece.

^a It is necessary that the test report indicated the source of the test piece.

8.2 Finished hose

When tested in accordance with the methods in [Table 3](#), the physical properties of the finished hose shall comply with the values given in [Table 3](#).