
International Standard



2928

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Rubber hoses and hose assemblies for liquefied petroleum gases (LPG) — Bulk transfer applications — Specification

Tuyaux et flexibles en caoutchouc pour gaz de pétrole liquéfiés (LPG) — Application au transfert de vrac — Spécifications

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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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 2928 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*.

This second edition cancels and replaces the first edition (ISO 2928-1975), of which it constitutes a technical revision. <https://standards.iteh.ai/catalog/standards/sist/7504df08-9c69-4ee7-8705-99a3b0776ab2/iso-2928-1986>

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

Rubber hoses and hose assemblies for liquefied petroleum gases (LPG) — Bulk transfer applications — Specification

1 Scope and field of application

This International Standard specifies the requirements for flexible rubber hose and hose assemblies for bulk transfer use with rail tank wagons or road tank vehicles transporting liquefied petroleum gases (LPG) and on lines carrying liquefied petroleum gas.

Usage for automotive fuel line applications is excluded.

The hoses specified in this International Standard are intended for use "wet", i.e. permanently filled with liquid in the temperature range of -40 to $+60$ °C.

Although this International Standard states the requirements for hoses and hose assemblies for use at a maximum working pressure of 2 MPa (20 bar), it is not intended to preclude the construction of hose for special applications capable of operating at higher working pressures.

2 References

ISO 37, *Rubber, vulcanized — Determination of tensile stress-strain properties.*

ISO 188, *Rubber, vulcanized — Accelerated ageing or heat-resistance tests.*

ISO 1307, *Rubber and plastics hoses — Bore diameters and tolerances on length.*

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

ISO 1817, *Rubber, vulcanized — Determination of the effects of liquids.*

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

ISO 4672, *Rubber products — Hoses — Low-temperature flexibility tests.*

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

ISO 8031, *Rubber and plastics hoses — Determination of electrical resistance.*¹⁾

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

3 Construction

The hose shall consist of a rubber lining, one or more layers of textile reinforcement and an abrasion-resistant rubber cover. If required, the cover shall be pricked to release entrapped gases. The finished hose shall be free from blisters, porosity and other defects.

4 Dimensions and tolerances

4.1 Nominal bore

The nominal bore and tolerances shall meet the requirements of table 1 when measured in accordance with ISO 4671.

Table 1 — Nominal bores and tolerances

Values in millimetres

Nominal bore	Tolerance
8 10 12,5 16 20	$\pm 0,75$
25 31,5	$\pm 1,25$
40 50 63	$\pm 1,50$
80 100 160 200	$\pm 2,00$

1) At present at the stage of draft.

4.2 Cut length

The tolerances on cut length shall be as specified in ISO 1307.

5 Physical requirements of finished hose

5.1 Tensile strength and elongation at break of lining and cover

The rubber used for the lining and cover shall, when tested in accordance with ISO 37, have a tensile strength and elongation at break not less than the values given in table 2.

Table 2 — Tensile strength and elongation at break

Hose element	Tensile strength MPa	Elongation at break %
Lining	7,0	200
Cover	10,0	250

5.2 Accelerated ageing

After ageing in air for 3 days at a temperature of 100 ± 1 °C as specified in ISO 188, the tensile strength and elongation at break of the lining and cover shall not decrease by more than 25 % and 50 % respectively from the initial values.

NOTE — There is no limitation on the increase in the value of these properties.

5.3 Hydrostatic requirements

Each length of hose shall be subjected to the proof pressure test and a representative sample taken from the batch as manufactured shall be subjected to the proof pressure and burst pressure test and shall, when tested as specified in ISO 1402, comply with the requirements in table 3.

Table 3 — Hydrostatic test requirements

Working pressure		Proof pressure		Minimum bursting pressure		Change in length at proof pressure
MPa	bar	MPa	bar	MPa	bar	
2	20	6,3	63	12,6	126	7 % max.

Each length of hose shall be examined at proof pressure for evidence of leakage or signs of distortion.

5.4 Adhesion

When tested in accordance with ISO 8033, the adhesion between the various elements shall be not less than 1,5 kN/m.

5.5 Low-temperature flexibility

The test shall be carried out in accordance with ISO 4672, method B, at a temperature of -40 ± 3 °C. After completion of the test, the test piece shall show no signs of cracking or breaking and shall show no signs of leaks when subjected to the specified proof pressure.

5.6 Electrical continuity

When electrical continuity is a requirement, each hose assembly shall be tested in accordance with ISO 8031 to establish that electrical continuity exists between the end couplings.

5.7 Resistance to liquids

Test pieces cut from the lining of the hose shall be tested by the method specified in ISO 1817, clause 11, after immersion in *n*-hexane for 72 ± 2 h at 23 ± 2 °C. The tensile strength and elongation at break shall be not less than 65 % of the original values.

5.8 Ozone resistance

When tested in accordance with ISO 7326, the hose cover shall show no signs of cracking.

5.9 Permeance

A test method will be included at a later date. ¹⁾

6 Marking

Each length of hose shall be clearly marked at least once every 3 m with the following information :

- a) the manufacturer's name or trade mark;
- b) the number of this International Standard;
- c) the nominal bore size;
- d) the design working pressure;
- e) the quarter and the year of manufacture.

1) It is possible that the test method specified in ISO 8308 (at present at the stage of draft) will suffice, as the hoses are operating "wet" and are not conveying a gaseous medium.