INTERNATIONAL STANDARD ISO 2928

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Rubber hose for liquefied petroleum gases (LPG)

Tuyaux en caoutchouc pour gaz de pétrole liquéfiés

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FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up 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.

International Standard ISO 2928 was drawn up by Technical Committee ISO/TC 45, *Rubber and rubber products*, and circulated to the Member Bodies in November 1974.

It has been approved by the Member Bodies of the following countries :

Australia	Ireland	South Africa, Rep. of
Brazil	Italy	Spain
Canada	Mexico	Sweden
Egypt, Arab Rep. of	New Zealand	Switzerland
Germany	Poland	Thailand
Hungary	Portugal	U.S.A.
India	Romania	U.S.S.R.

The Member Bodies of the following countries expressed disapproval of the document on technical grounds :

Belgium
France
United Kingdom

Rubber hose for liquefied petroleum gases (LPG)

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the requirements for flexible rubber hose for use with tank trucks or vehicles for the transport of liquefied petroleum gases (LPG).

The hose specified in this International Standard is intended for use "wet", i.e. permanently filled with liquid, and in the temperature range from − 20 °C to + 40 °C.

Although this International Standard states the requirements for hose 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.

NOTES

1 The requirements for larger hose will be a matter for future study. In addition, a study will be made of the requirements for electrical resistance and recommended minimum bend radii.

2 Wire-reinforced hose is also used with liquefied petroleum gases, and attention is drawn to ISO 1436.

2 REFERENCES

ISO/R 36, *Determination of the adhesion strength of vulcanized rubbers to textile fabrics.*

ISO/R 37, *Determination of tensile stress-strain properties of vulcanized rubbers.*

ISO/R 188, *Vulcanized rubbers — Accelerated ageing or heat resistance tests.*

ISO/R 471, *Standard atmosphere for the conditioning and testing of rubber test pieces.*

ISO 1307, *Rubber hose — Bore sizes, tolerances on length and test pressures.*

ISO 1402, *Rubber hose — Hydrostatic testing.*

ISO 1436, *Wire reinforced, rubber covered hydraulic hose.*

ISO/R 1817, *Vulcanized rubbers — Methods of test for resistance to liquids.*

3 DIMENSIONS AND TOLERANCES

3.1 Bore

The bore of the hose shall be in accordance with the nominal dimensions and tolerances given in table 1, which is in accordance with ISO 1307.

NOTE — If special cases call for extra sizes :

For smaller or larger dimensions, further numbers shall be chosen from the R 10 series of preferred numbers, the tolerances being as given in ISO 1307.

For intermediate dimensions, numbers shall be chosen from the R 20 series of preferred numbers, the tolerances being as for the next larger bore size from the R 10 series.

TABLE 1 — **Nominal bore**

Values in millimetres

Nominal bore	Tolerance
8	± 0,75
10	± 0,75
12,5	± 0,75
16	± 0,75
20	± 0,75
25	± 1,25
31,5	± 1,25
40	± 1,50
50	± 1,50
63	± 1,50
80	± 2,00

3.2 Length

The tolerances on cut lengths of hose shall be as specified in ISO 1307.

4 PHYSICAL REQUIREMENTS ON FINISHED HOSE

4.1 Tensile strength and elongation at break of rubber lining and cover

The rubber used for the lining and cover of the hose shall, when tested in the manner described in ISO/R 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**

	Tensile strength MN/m²	**Elongation at break** %
Lining	7,0	175
Cover	8,5	200

4.2 Accelerated ageing

After ageing for 72 h at a temperature of 100 °C as described in ISO/R 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 value of these properties.

4.3 Adhesion

When tested in accordance with ISO/R 36, the minimum adhesion between rubber lining and reinforcement, between layers of reinforcement, and between reinforcement and cover, shall be not less than 1,5 kN/m.

4.4 Hydrostatic requirements

4.4.1 *Proof pressure*

When the full length of hose is tested at a pressure of 4 MPa (40 bar) by the proof test specified in ISO 1402, no leakage or other signs of weakness shall be detected; the change in length shall not be greater than 7 %.

4.4.2 *Bursting pressure*

When a test piece cut from a length of hose is subjected to the bursting pressure test specified in ISO 1402, the bursting pressure shall not be less than 10 MPa (100 bar).

4.5 Low temperature

When a test piece cut from a length of hose is conditioned at − 40 ± 2 °C for 5 h and then bent 180° around a mandrel (which has been similarly conditioned) with a diameter 12 times the nominal bore of the hose, no cracks or breaks shall be shown.

4.6 Resistance to liquids

When test pieces cut from the lining are tested by the method described in ISO/R 1817, by immersion in standard liquid A for 24 h at one of the standard temperatures defined in ISO/R 471, they shall not show a volume change greater than 30 %.

5 COVER

If agreed between the manufacturer and the user, the cover may be pricked and these marks shall not be considered as imperfections.

6 MARKING

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

a) manufacturer's name or trade-mark;

b) LPG 2 MPa (20 bar) max. W.P.;

c) year of manufacture.