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Rubber hoses, textile-reinforced, for general-purpose water applications — Specification

*Tuyaux en caoutchouc à armature textile d'usage général pour l'eau —
Spécifications*



Reference number
ISO 1403:1995(E)

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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 1403 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 1, *Hoses (rubber and plastics)*.

This third edition cancels and replaces the second edition (ISO 1403:1986), which has been technically revised.

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Rubber hoses, textile-reinforced, for general-purpose water applications — Specification

1 Scope

This International Standard specifies the requirements for three types of general-purpose textile-reinforced rubber water hose with an operating range of $-25\text{ }^{\circ}\text{C}$ to $+70\text{ }^{\circ}\text{C}$, and a maximum working pressure of up to 2,5 MPa.

NOTE 1 These hoses should **not** be used for conveyance of potable (drinking) water, for washing-machine inlets, as fire-fighting hose, for special agricultural machines and as collapsible water hose.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3:1973, *Preferred numbers — Series of preferred numbers*.

ISO 37:1994, *Rubber, vulcanized or thermoplastic — Determination of tensile stress-strain properties*.

ISO 188:1982, *Rubber, vulcanized — Accelerated ageing or heat-resistance tests*.

ISO 1307:1992, *Rubber and plastics hoses for general-purpose industrial applications — Bore diameters and tolerances, and tolerances on length*.

ISO 1402:1994, *Rubber and plastics hoses and hose assemblies — Hydrostatic testing*.

ISO 2393:1994, *Rubber test mixes — Preparation, mixing and vulcanization — Equipment and procedures*.

ISO 4671:1984, *Rubber and plastics hose and hose assemblies — Methods of measurement of dimensions*.

ISO 4672:—¹⁾, *Rubber and plastics hoses — Subambient-temperature flexibility tests*.

ISO 7326:1991, *Rubber and plastics hoses — Assessment of ozone resistance under static conditions*.

ISO 8033:1991, *Rubber and plastics hose — Determination of adhesion between components*.

3 Types of hose

Three types of hose are specified, as follows:

Type 1: Low pressure — designed for a maximum working pressure of 0,6 MPa (6 bar) for all sizes;

Type 2: Medium pressure — designed for a maximum working pressure of 1,0 MPa (10 bar) for all sizes;

Type 3: High pressure — designed for a maximum working pressure of 2,5 MPa (25 bar) for all sizes.

1) To be published. (Revision of ISO 4672:1988)

4 Construction and materials

The hose shall consist of

- a rubber lining;
- a reinforcement of natural or synthetic fibres;
- a rubber cover.

The lining and cover shall be of uniform thickness, concentric to comply with the minimum thickness and free from holes, porosity and other defects. The cover finish may be smooth, fluted or fabric-marked.

5 Dimensions

5.1 Bore

The bore of the hose shall be from 10 mm to 100 mm inclusive and in accordance with the nominal dimensions and tolerances given in ISO 1307.

If special cases call for extra sizes:

- a) for smaller or larger dimensions, further numbers shall be chosen from the R 10 series of preferred numbers (see ISO 3), with tolerances as specified in ISO 1307;
- b) for intermediate dimensions, numbers shall be chosen from the R 20 series of preferred numbers (see ISO 3), with the tolerances as given for the next-larger size.

5.2 Lining

When measured in accordance with ISO 4671, the minimum thickness of the lining shall be 1,5 mm.

5.3 Cover

When measured in accordance with ISO 4671, the minimum thickness of the cover shall be 1,5 mm. If the cover is fluted, the depth of the flutes shall be not greater than 50 % of the cover thickness.

5.4 Cut lengths

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

6 Physical properties

6.1 Testing

Wherever possible, all tests shall be carried out on test pieces cut from finished hose. Otherwise, take samples from test sheets prepared in accordance with ISO 2393 and vulcanized to the same degree as the hose.

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

When tested in accordance with ISO 37, the lining and cover shall have a tensile strength and elongation at break of not less than the values given in table 1.

Table 1 — Minimum values of tensile strength and elongation at break of rubber lining and cover

Hose type	Tensile strength MPa	Elongation at break %
1 and 2	5,0	200
3	7,0	200

6.3 Accelerated ageing

After ageing as specified in ISO 188 for 3 days at a temperature of $100\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$, the tensile strength and elongation at break of the lining and cover, as determined by ISO 37, shall not vary by more than $\pm 25\%$ and $\pm 50\%$, respectively, from the initial values.

6.4 Hydrostatic-pressure requirements

When tested in accordance with ISO 1402, the hose shall meet the requirements of table 2. The maximum variation in length and outside diameter at proof pressure shall be $\pm 7\%$.

Table 2 — Hydrostatic-pressure requirements

Hose type	Maximum working pressure MPa	Proof pressure MPa	Minimum burst pressure MPa
1	0,60	0,90	1,80
2	1,0	1,5	3,00
3	2,5	5,0	10,00

6.5 Adhesion

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

6.6 Ozone resistance

When tested in accordance with method 2 of ISO 7326:1991, the cover shall show no signs of cracking.

6.7 Low-temperature flexibility

When tested at -25 °C by method B of ISO 4672, all types of hose shall show no cracks and shall pass the proof pressure test as specified in 6.4.

7 Marking

The hose shall be continuously and durably marked with the following information:

- a) the number of this International Standard, i.e. ISO 1403;
- b) the manufacturer's name or identification;
- c) the manufacturer's product identification (optional);
- d) the type of hose;
- e) the nominal bore;
- f) the maximum working pressure, in megapascals, if not included under d);
- g) the quarter (using 1Q, 2Q, 3Q or 4Q) and year (using four digits) of manufacture.

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