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INTERNATIONAL STANDARD 1403

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

General purpose rubber water hose

Tuyaux à eau en caoutchouc pour usages généraux

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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.

Prior to 1972, the results of the work of the technical committees were published as ISO Recommendations; these documents are in the process of being transformed into International Standards. As part of this process, Technical Committee ISO/TC 45, *Rubber and rubber products,* has reviewed ISO Recommendation R 1403-1970 and found it technically suitable for transformation. International Standard ISO 1403 therefore replaces ISO Recommendation R 1403-1970, to which it is technically identical.

ISO Recommendation R 1403 had been approved by the member bodies of the following countries :

Austria	India	Spain
Brazil	Iran	Sweden
Czechoslovakia	Israel	Switzerland
Egypt, Arab Rep. of	Italy	United Kingdom
France	Japan	U.S.S.R.
Germany	Netherlands	Yugoslavia
Greece	New Zealand	
Hungary	Poland	

The member bodies of the following countries had expressed disapproval of the Recommendation on technical grounds :

Ireland
U.S.A.

The member body of the U.S.A. also disapproved the transformation of the Recommendation into an International Standard.

Printed in Switzerland

General purpose rubber water hose

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the minimum acceptable requirements for the satisfactory performance of three types of general purpose rubber water hose as follows :

Type 1 — Low pressure : designed for a maximum working pressure of 0,6 MPa* and a test pressure of 0,75 MPa (all sizes).

Type 2 — Medium pressure : designed for a maximum working pressure of 1,0 MPa and a test pressure of 1,6 MPa (sizes up to 50 mm nominal bore).

Type 3 — High pressure : designed for a maximum working pressure of 2,5 MPa and a test pressure of 5,0 MPa (sizes up to 25 mm nominal bore).

The list of nominal bores given in table 1 [based on the R 10 series of preferred numbers (see ISO 3)] is not intended to be restrictive and will not preclude the manufacture of sizes outside this list which may be the subject of individual national standards.

2 REFERENCES

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

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

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

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

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

ISO 1402, *Rubber hose — Hydrostatic testing.*

3 MATERIALS

The hose shall be made with a rubber lining and shall have a reinforcement of natural or synthetic fibres and a rubber cover.

4 CONSTRUCTION

4.1 The lining and cover shall be of uniform thickness, reasonably concentric, and free from air holes, porosity and other defects.

4.2 The lining shall be as smooth in the bore as is consistent with good manufacturing practice.

4.3 The cover of the moulded-type hose shall be smooth or fluted as required. The cover of mandrel-built hose shall have a smooth, fluted or cloth-wrapped finish.

4.4 The hose shall be uniformly vulcanized.

5 DIMENSIONS AND TOLERANCES

5.1 Bore

The bore of the hose shall be in accordance with the nominal dimensions and tolerances given in table 1.

TABLE 1 — **Nominal bores**

Values in millimetres

Nominal bore	Tolerance	Nominal bore	Tolerance
10	± 0,75	40	± 1,50
12,5	± 0,75	50	± 1,50
16	± 0,75	63	± 1,50
20	± 0,75	80	± 2,00
25	± 1,25	100	± 2,00
31,5	± 1,25		

NOTE — 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 for the next larger bore size from the R 20 series.

* 1 MPa = 1 MN/m^2

5.2 Length

The tolerances on cut lengths of hose shall be as given in table 2.

TABLE 2 – **Tolerances on cut lengths**

Values in millimetres

Length	Tolerance
up to 300	± 3,0
over 300 to 600	± 4,5
over 600 to 900	± 6,0
over 900 to 1 200	± 9,0
over 1 200 to 1 800	± 12,0
over 1 800	± 1 %

6 PHYSICAL TESTS ON FINISHED HOSE

6.1 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 specified in ISO 37, give a tensile strength and elongation at break not less than the values given in table 3.

TABLE 3 – **Tensile strength and elongation at break**

Type		Tensile strength MPa	Elongation at break %
1 and 2	Lining	5,0	200
	Cover	5,0	200
3	Lining	7,0	250
	Cover	7,0	250

6.2 Accelerated ageing test

After ageing for 72 h at a temperature of 70 °C as specified in ISO 188, the tensile strength and elongation at break of the lining and cover shall not vary by more than ± 25 % and + 10 % to – 30 % respectively from the initial values.

6.3 Hydrostatic test

The hose, when tested by the method specified in ISO 1402, shall meet the requirements of table 4.

TABLE 4 – **Hydrostatic test requirements**

Type	Design working pressure MPa	Proof test pressure MPa	Change in diameter at proof test pressure %	Minimum bursting pressure MPa
1	0,60	0,75	No test	1,5
2	1,0	1,6	No test	3,15
3	2,5	5,0	+ 7 / – 3	10,0

6.4 Adhesion test

Where suitable test pieces can be prepared (see 5.2 of ISO/R 36), test in accordance with ISO/R 36.

6.5 Low temperature test

To be included at a later date when the test method has been agreed.

7 MARKING

The marking, if required, shall be as agreed between the manufacturer and the user.