
**Plastics hose — General-purpose
collapsible water hose, textile-
reinforced — Specification**

*Tuyaux plastiques — Tuyaux d'eau écrasables d'usage général
renforcés textiles — 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. 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 third edition cancels and replaces the second edition (ISO 8029:2007), which has been technically revised. Fifteen sizes of inside diameter were added in order to conform to the couplings and end fittings available in the market (see [Table 1](#)).

Introduction

This International Standard has been prepared to provide minimum requirements for the satisfactory performance of textile-reinforced thermoplastic collapsible water hose, for discharge applications, conveying water, aqueous sludge or slurries.

In view of such applications, requirements and the corresponding tests have been specified for exposure to laboratory light sources (see [8.2.5](#)) and for abrasion resistance (see [8.2.6](#)).

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Plastics hose — General-purpose collapsible water hose, textile-reinforced — Specification

1 Scope

This International Standard specifies the requirements for four types of textile-reinforced thermoplastics collapsible water hoses for general applications for use in the temperature range of $-10\text{ }^{\circ}\text{C}$ to $55\text{ }^{\circ}\text{C}$. Such hoses are classified into four types, as follows:

- low pressure, designed for a maximum working pressure of up to 0,4 MPa (4,0 bar) at $23\text{ }^{\circ}\text{C}$ and up to 0,2 MPa (2,0 bar) at $55\text{ }^{\circ}\text{C}$;
- medium pressure, for a maximum working pressure of up to 0,7 MPa (7,0 bar) at $23\text{ }^{\circ}\text{C}$ and up to 0,36 MPa (3,6 bar) at $55\text{ }^{\circ}\text{C}$;
- high pressure, for a maximum working pressure of up to 1,0 MPa (10,0 bar) at $23\text{ }^{\circ}\text{C}$ and up to 0,51 MPa (5,1 bar) at $55\text{ }^{\circ}\text{C}$;
- extra-high pressure, for a maximum working pressure of up to 1,55 MPa (15,5 bar) at $23\text{ }^{\circ}\text{C}$ and up to 0,79 MPa (7,9 bar) at $55\text{ }^{\circ}\text{C}$.

This International Standard does not apply to products used for fire-fighting or the conveyance of drinking water.

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 3, *Preferred numbers — Series of preferred numbers*

ISO 37, *Rubber, vulcanized 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 8033, *Rubber and plastics hoses — Determination of adhesion between components*

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

ISO 9352, *Plastics — Determination of resistance to wear by abrasive wheels*

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

ISO 10619-2, *Rubber and plastics hoses and tubing — Measurement of flexibility and stiffness — Part 2: Bending tests at sub-ambient temperatures*

ISO 23529, *Rubber — General procedures for preparing and conditioning test pieces for physical test methods*

ISO 30013, *Rubber and plastics hoses — Methods of exposure to laboratory light sources — Determination of changes in colour, appearance and other physical properties*

3 Terms and definitions

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

4 Classification

Hoses are designated as one of the following four types depending on their pressure rating at the specified temperatures:

- Type A: Low working pressure hose, designed for a maximum working pressure of up to 0,4 MPa (4,0 bar) at 23 °C and up to 0,2 MPa (2,0 bar) at 55 °C;
- Type B: Medium working pressure hose, designed for a maximum working pressure of up to 0,7 MPa (7,0 bar) at 23 °C and up to 0,36 MPa (3,6 bar) at 55 °C;
- Type C: High working pressure hose, designed for a maximum working pressure of up to 1,0 MPa (10,0 bar) at 23 °C and up to 0,51 MPa (5,1 bar) at 55 °C;
- Type D: Extra high working pressure hose, designed for a maximum working pressure of up to 1,55 MPa (15,5 bar) at 23 °C and up to 0,79 MPa (7,9 bar) at 55 °C.

5 Couplings and end fittings

Hoses may be fitted with the appropriate coupling type and the end fitting to form hose assemblies. Guidance on coupling type is given in [Annex D](#) and ISO/TR 17784:2003, Clause 7: Couplings.

6 Materials and construction

The hose shall consist of:

- a) a flexible thermoplastic lining;
- b) a reinforcement made of natural or synthetic textile material, applied by any suitable technique; and
- c) a flexible thermoplastic cover.

The lining and the cover shall be of uniform thickness, fully gelled and free from visible cracks, porosity, foreign inclusions and other defects. The cover may have a smooth or fluted finish, and shall be abrasion-resistant.

7 Dimensions and tolerances

7.1 Inside diameter and tolerance

The inside diameter of the hose and the tolerance on the inside diameter shall meet the requirements of [Table 1](#).

Table 1 — Inside diameter and tolerance

Inside diameter (mm)	Tolerance on I.D. (mm)
19	±1,5
25	±1,5
26,5	±1,5
31,5	±1,5
33	±1,5
40	±2,0
41	±2,0
50	±2,0
52,5	±2,0
63	±2,0
65	±2,0
66	±2,0
75	±2,0
78	±2,0
80	±2,25
100	±2,25
104	±2,25
125	±3,0
128	±3,0
150	±3,0
155	±3,0
160	±3,0
200	±3,0
207	±3,0
250	±3,0
258	±3,0
300	±3,0
309	±3,0
350	±4,0
359	±4,0
400	±4,0
410	±4,0
If special cases call for extra sizes: — for smaller or larger dimensions, further numbers shall be chosen from the R10 series of preferred numbers (see ISO 3), with tolerances as given in ISO 1307; — for intermediate dimensions, numbers shall be chosen from the R20 series of preferred numbers (see ISO 3), with the tolerances as given for the next-larger size in the table above.	

7.2 Tolerance on length

If the cut length of the hose is less than or equal to 1 800 mm, the tolerance on length shall be as specified in ISO 1307.

If the cut length of the hose is over 1 800 mm, the tolerance shall be ± 2 % of the length specified.

8 Physical properties

8.1 Plastic compounds

The physical properties of compounds used for the lining and the cover shall conform to the values in [Table 2](#), when determined by the methods listed in [Table 2](#).

Tests shall be carried out either on test pieces taken from the hose or on test pieces taken from sheet made, using a laboratory press, under the same conditions as used in the manufacture of the hose.

Table 2 — Physical properties of compounds

Property	Requirements		Test method
	Lining	Cover	
Tensile strength (min.), MPa	10,0	10,0	ISO 37 (dumb-bell test piece)
Elongation at break (min.), %	160	160	ISO 37 (dumb-bell test piece)
Ageing			ISO 188 (48 h at +70 °C, air-oven method)
Max. change in tensile strength from original value, %	± 20	± 20	ISO 37 (dumb-bell test piece)

8.2 Performance requirements for finished hose

8.2.1 Hydrostatic requirements at standard laboratory temperature

When tested at standard laboratory temperature as specified in ISO 23529, by the method described in ISO 1402, hoses shall withstand the appropriate proof and minimum burst pressures specified in [Tables 3](#) and [4](#).

At the maximum working pressure appropriate to the type and size of hose as specified, the change in length of the hose shall not exceed ± 7 % and the change in diameter of the hose shall be no greater than ± 20 % when measured by the method described in ISO 1402.

During and after the proof pressure hold test described in ISO 1402, the hose shall be examined for evidence of leakage, cracking, abrupt distortion or other signs of failure indicating irregularities in material or manufacture. No such defects shall be observed.

Table 3 — Hydrostatic-pressure requirements for Type A and B hoses at 23 °C

I.D. mm	Type A						Type B					
	Maximum working pressure		Proof pressure		Minimum burst pressure		Maximum working pressure		Proof pressure		Minimum burst pressure	
	MPa	bar	MPa	bar	MPa	bar	MPa	bar	MPa	bar	MPa	bar
19	—	—	—	—	—	—	0,7	7,0	1,05	10,5	2,1	21,0
25	—	—	—	—	—	—	0,7	7,0	1,05	10,5	2,1	21,0
26,5	—	—	—	—	—	—	0,7	7,0	1,05	10,5	2,1	21,0
31,5	—	—	—	—	—	—	0,7	7,0	1,05	10,5	2,1	21,0
33	—	—	—	—	—	—	0,7	7,0	1,05	10,5	2,1	21,0
40	0,4	4,0	0,6	6,0	1,2	12,0	0,7	7,0	1,05	10,5	2,1	21,0
41	0,4	4,0	0,6	6,0	1,2	12,0	0,7	7,0	1,05	10,5	2,1	21,0
50	0,4	4,0	0,6	6,0	1,2	12,0	0,7	7,0	1,05	10,5	2,1	21,0
52,5	0,4	4,0	0,6	6,0	1,2	12,0	0,7	7,0	1,05	10,5	2,1	21,0
63	0,4	4,0	0,6	6,0	1,2	12,0	0,7	7,0	1,05	10,5	2,1	21,0
65	0,4	4,0	0,6	6,0	1,2	12,0	0,7	7,0	1,05	10,5	2,1	21,0
66	0,4	4,0	0,6	6,0	1,2	12,0	0,7	7,0	1,05	10,5	2,1	21,0
75	0,3	3,0	0,45	4,5	0,9	9,0	0,7	7,0	1,05	10,5	2,1	21,0
78	0,3	3,0	0,45	4,5	0,9	9,0	0,7	7,0	1,05	10,5	2,1	21,0
80	0,3	3,0	0,45	4,5	0,9	9,0	0,7	7,0	1,05	10,5	2,1	21,0
100	0,3	3,0	0,45	4,5	0,9	9,0	0,7	7,0	1,05	10,5	2,1	21,0
104	0,3	3,0	0,45	4,5	0,9	9,0	0,7	7,0	1,05	10,5	2,1	21,0
125	0,25	2,5	0,37	3,7	0,75	7,5	0,5	5,0	0,75	7,5	1,5	15,0
128	0,25	2,5	0,37	3,7	0,75	7,5	0,5	5,0	0,75	7,5	1,5	15,0
150	0,25	2,5	0,37	3,7	0,75	7,5	0,5	5,0	0,75	7,5	1,5	15,0
155	0,25	2,5	0,37	3,7	0,75	7,5	0,5	5,0	0,75	7,5	1,5	15,0
160	0,25	2,5	0,37	3,7	0,75	7,5	0,5	5,0	0,75	7,5	1,5	15,0
200	0,25	2,5	0,37	3,7	0,75	7,5	0,4	4,0	0,60	6,0	1,2	12,0
207	0,25	2,5	0,37	3,7	0,75	7,5	0,4	4,0	0,60	6,0	1,2	12,0
250	0,20	2,0	0,30	3,0	0,60	6,0	0,4	4,0	0,60	6,0	1,2	12,0
258	0,20	2,0	0,30	3,0	0,60	6,0	0,4	4,0	0,60	6,0	1,2	12,0
300	0,20	2,0	0,30	3,0	0,60	6,0	—	—	—	—	—	—
309	0,20	2,0	0,30	3,0	0,60	6,0	—	—	—	—	—	—
350	0,20	2,0	0,30	3,0	0,60	6,0	—	—	—	—	—	—
359	0,20	2,0	0,30	3,0	0,60	6,0	—	—	—	—	—	—
400	0,20	2,0	0,30	3,0	0,60	6,0	—	—	—	—	—	—
410	0,20	2,0	0,30	3,0	0,60	6,0	—	—	—	—	—	—

NOTE 1 bar = 0,1 MPa.

Table 4 — Hydrostatic-pressure requirements for Type C and D hoses at 23 °C

I.D. mm	Type C						Type D					
	Maximum working pressure		Proof pressure		Minimum burst pressure		Maximum working pressure		Proof pressure		Minimum burst pressure	
	MPa	bar	MPa	bar	MPa	bar	MPa	bar	MPa	bar	MPa	bar
19	1,0	10,0	1,5	15,0	3,0	30,0	1,55	15,5	2,32	23,2	4,65	46,5
25	1,0	10,0	1,5	15,0	3,0	30,0	1,55	15,5	2,32	23,2	4,65	46,5
26,5	1,0	10,0	1,5	15,0	3,0	30,0	1,55	15,5	2,32	23,2	4,65	46,5
31,5	1,0	10,0	1,5	15,0	3,0	30,0	1,55	15,5	2,32	23,2	4,65	46,5
33	1,0	10,0	1,5	15,0	3,0	30,0	1,55	15,5	2,32	23,2	4,65	46,5
40	1,0	10,0	1,5	15,0	3,0	30,0	1,55	15,5	2,32	23,2	4,65	46,5
41	1,0	10,0	1,5	15,0	3,0	30,0	1,55	15,5	2,32	23,2	4,65	46,5
50	1,0	10,0	1,5	15,0	3,0	30,0	1,55	15,5	2,32	23,2	4,65	46,5
52,5	1,0	10,0	1,5	15,0	3,0	30,0	1,55	15,5	2,32	23,2	4,65	46,5
63	1,0	10,0	1,5	15,0	3,0	30,0	1,55	15,5	2,32	23,2	4,65	46,5
65	1,0	10,0	1,5	15,0	3,0	30,0	1,55	15,5	2,32	23,2	4,65	46,5
66	1,0	10,0	1,5	15,0	3,0	30,0	1,55	15,5	2,32	23,2	4,65	46,5
75	0,9	9,0	1,35	13,5	2,7	27,0	1,15	11,5	1,72	17,2	3,45	34,5
78	0,9	9,0	1,35	13,5	2,7	27,0	1,15	11,5	1,72	17,2	3,45	34,5
80	0,9	9,0	1,35	13,5	2,7	27,0	1,15	11,5	1,72	17,2	3,45	34,5
100	0,9	9,0	1,35	13,5	2,7	27,0	—	—	—	—	—	—
104	0,9	9,0	1,35	13,5	2,7	27,0	—	—	—	—	—	—
125	0,7	7,0	1,05	10,5	2,1	21,0	—	—	—	—	—	—
128	0,7	7,0	1,05	10,5	2,1	21,0	—	—	—	—	—	—
150	0,7	7,0	1,05	10,5	2,1	21,0	—	—	—	—	—	—
155	0,7	7,0	1,05	10,5	2,1	21,0	—	—	—	—	—	—
160	0,7	7,0	1,05	10,5	2,1	21,0	—	—	—	—	—	—
200	0,5	5,0	0,75	7,5	1,5	15,0	—	—	—	—	—	—
207	0,5	5,0	0,75	7,5	1,5	15,0	—	—	—	—	—	—
250	0,5	5,0	0,75	7,5	1,5	15,0	—	—	—	—	—	—
258	0,5	5,0	0,75	7,5	1,5	15,0	—	—	—	—	—	—
300	—	—	—	—	—	—	—	—	—	—	—	—
309	—	—	—	—	—	—	—	—	—	—	—	—
350	—	—	—	—	—	—	—	—	—	—	—	—
359	—	—	—	—	—	—	—	—	—	—	—	—
400	—	—	—	—	—	—	—	—	—	—	—	—
410	—	—	—	—	—	—	—	—	—	—	—	—

NOTE 1 bar = 0,1 MPa.

8.2.2 Hydrostatic-pressure requirements at 55 °C

When tested by the method specified in ISO 1402 at (55 ± 2) °C, hoses shall withstand the appropriate proof and minimum burst pressures specified in [Table 5](#) and [6](#).

Table 5 — Hydrostatic-pressure requirements for Type A and B hoses at 55 °C

I.D. mm	Type A						Type B					
	Maximum working pressure		Proof pressure		Minimum burst pressure		Maximum working pressure		Proof pressure		Minimum burst pressure	
	MPa	bar	MPa	bar	MPa	bar	MPa	bar	MPa	bar	MPa	bar
19	—	—	—	—	—	—	0,36	3,6	0,54	5,4	1,08	10,8
25	—	—	—	—	—	—	0,36	3,6	0,54	5,4	1,08	10,8
26,5	—	—	—	—	—	—	0,36	3,6	0,54	5,4	1,08	10,8
31,5	—	—	—	—	—	—	0,36	3,6	0,54	5,4	1,08	10,8
33	—	—	—	—	—	—	0,36	3,6	0,54	5,4	1,08	10,8
40	0,2	2,0	0,3	3,0	0,6	6,0	0,36	3,6	0,54	5,4	1,08	10,8
41	0,2	2,0	0,3	3,0	0,6	6,0	0,36	3,6	0,54	5,4	1,08	10,8
50	0,2	2,0	0,3	3,0	0,6	6,0	0,36	3,6	0,54	5,4	1,08	10,8
52,5	0,2	2,0	0,3	3,0	0,6	6,0	0,36	3,6	0,54	5,4	1,08	10,8
63	0,2	2,0	0,3	3,0	0,6	6,0	0,35	3,5	0,52	5,2	1,05	10,5
65	0,2	2,0	0,3	3,0	0,6	6,0	0,35	3,5	0,52	5,2	1,05	10,5
66	0,2	2,0	0,3	3,0	0,6	6,0	0,35	3,5	0,52	5,2	1,05	10,5
75	0,15	1,5	0,22	2,2	0,45	4,5	0,35	3,5	0,52	5,2	1,05	10,5
78	0,15	1,5	0,22	2,2	0,45	4,5	0,35	3,5	0,52	5,2	1,05	10,5
80	0,15	1,5	0,22	2,2	0,45	4,5	0,35	3,5	0,52	5,2	1,05	10,5
100	0,15	1,5	0,22	2,2	0,45	4,5	0,35	3,5	0,52	5,2	1,05	10,5
104	0,15	1,5	0,22	2,2	0,45	4,5	0,35	3,5	0,52	5,2	1,05	10,5
125	0,13	1,3	0,20	2,0	0,39	3,9	0,24	2,4	0,36	3,6	0,72	7,2
128	0,13	1,3	0,20	2,0	0,39	3,9	0,24	2,4	0,36	3,6	0,72	7,2
150	0,13	1,3	0,20	2,0	0,39	3,9	0,24	2,4	0,36	3,6	0,72	7,2
155	0,13	1,3	0,20	2,0	0,39	3,9	0,24	2,4	0,36	3,6	0,72	7,2
160	0,13	1,3	0,2	2,0	0,39	3,9	0,24	2,4	0,36	3,6	0,72	7,2
200	0,13	1,3	0,2	2,0	0,39	3,9	0,19	1,9	0,28	2,8	0,57	5,7
207	0,13	1,3	0,2	2,0	0,39	3,9	0,19	1,9	0,28	2,8	0,57	5,7
250	0,1	1,0	0,15	1,5	0,3	3,0	0,19	1,9	0,28	2,8	0,57	5,7
258	0,1	1,0	0,15	1,5	0,3	3,0	0,19	1,9	0,28	2,8	0,57	5,7
300	0,1	1,0	0,15	1,5	0,3	3,0	—	—	—	—	—	—
309	0,1	1,0	0,15	1,5	0,3	3,0	—	—	—	—	—	—
350	0,1	1,0	0,15	1,5	0,3	3,0	—	—	—	—	—	—
359	0,1	1,0	0,15	1,5	0,3	3,0	—	—	—	—	—	—
400	0,1	1,0	0,15	1,5	0,3	3,0	—	—	—	—	—	—
410	0,1	1,0	0,15	1,5	0,3	3,0	—	—	—	—	—	—

NOTE 1 bar = 0,1 MPa.

Table 6 — Hydrostatic-pressure requirements for Type C and D hoses at 55 °C

I.D. mm	Type C						Type D					
	Maximum working pressure		Proof pressure		Minimum burst pressure		Maximum working pressure		Proof pressure		Minimum burst pressure	
	MPa	bar	MPa	bar	MPa	bar	MPa	bar	MPa	bar	MPa	bar
19	0,51	5,1	0,76	7,6	1,53	15,3	0,79	7,9	1,18	11,8	2,37	23,7
25	0,51	5,1	0,76	7,6	1,53	15,3	0,79	7,9	1,18	11,8	2,37	23,7
26,5	0,51	5,1	0,76	7,6	1,53	15,3	0,79	7,9	1,18	11,8	2,37	23,7
31,5	0,51	5,1	0,76	7,6	1,53	15,3	0,79	7,9	1,18	11,8	2,37	23,7
33	0,51	5,1	0,76	7,6	1,53	15,3	0,79	7,9	1,18	11,8	2,37	23,7
40	0,51	5,1	0,76	7,6	1,53	15,3	0,79	7,9	1,18	11,8	2,37	23,7
41	0,51	5,1	0,76	7,6	1,53	15,3	0,79	7,9	1,18	11,8	2,37	23,7
50	0,51	5,1	0,76	7,6	1,53	15,3	0,79	7,9	1,18	11,8	2,37	23,7
52,5	0,51	5,1	0,76	7,6	1,53	15,3	0,79	7,9	1,18	11,8	2,37	23,7
63	0,51	5,1	0,76	7,6	1,53	15,3	0,77	7,7	1,16	11,6	2,31	23,1
65	0,50	5,0	0,75	7,5	1,50	15,0	0,77	7,7	1,16	11,6	2,31	23,1
66	0,50	5,0	0,75	7,5	1,50	15,0	0,77	7,7	1,16	11,6	2,31	23,1
75	0,45	4,5	0,68	6,8	1,35	13,5	0,57	5,7	0,86	8,6	1,71	17,1
78	0,45	4,5	0,68	6,8	1,35	13,5	0,57	5,7	0,86	8,6	1,71	17,1
80	0,45	4,5	0,68	6,8	1,35	13,5	0,57	5,7	0,86	8,6	1,71	17,1
100	0,45	4,5	0,68	6,8	1,35	13,5	—	—	—	—	—	—
104	0,45	4,5	0,68	6,8	1,35	13,5	—	—	—	—	—	—
125	0,35	3,5	0,52	5,2	1,05	10,5	—	—	—	—	—	—
128	0,35	3,5	0,52	5,2	1,05	10,5	—	—	—	—	—	—
150	0,35	3,5	0,52	5,2	1,05	10,5	—	—	—	—	—	—
155	0,35	3,5	0,52	5,2	1,05	10,5	—	—	—	—	—	—
160	0,35	3,5	0,52	5,2	1,05	10,5	—	—	—	—	—	—
200	0,24	2,4	0,36	3,6	0,72	7,2	—	—	—	—	—	—
207	0,24	2,4	0,36	3,6	0,72	7,2	—	—	—	—	—	—
250	0,24	2,4	0,36	3,6	0,72	7,2	—	—	—	—	—	—
258	0,24	2,4	0,36	3,6	0,72	7,2	—	—	—	—	—	—
300	—	—	—	—	—	—	—	—	—	—	—	—
309	—	—	—	—	—	—	—	—	—	—	—	—
350	—	—	—	—	—	—	—	—	—	—	—	—
359	—	—	—	—	—	—	—	—	—	—	—	—
400	—	—	—	—	—	—	—	—	—	—	—	—
410	—	—	—	—	—	—	—	—	—	—	—	—

NOTE 1 bar = 0,1 MPa.

8.2.3 Adhesion test

When determined in accordance with ISO 8033 (using type 1 test pieces for inside diameters of less than 32 mm and type 2 test pieces for inside diameters of 32 mm and greater) at standard laboratory

temperature as specified in ISO 23529, the adhesion between the lining and the reinforcement, between the layers of reinforcement and between the reinforcement and the cover and between the lining and cover shall not be less than 1,5 kN/m.

8.2.4 Bending test

When tested, after conditioning for 24 h at standard laboratory temperature as specified in ISO 23529, in accordance with ISO 10619-1, using an internal hydraulic pressure equal to the maximum working pressure and a minimum radius of curvature of 8 times the inside diameter of the hose, the hose shall show no signs of leakage or cracks.

When tested, after conditioning for 5 h at $(-10 \pm 2)^\circ\text{C}$, in accordance with ISO 10619-2, using an internal hydraulic pressure equal to the maximum working pressure and a minimum radius of curvature of 16 times the inside diameter of the hose, the hose shall show no signs of leakage or cracks.

8.2.5 Exposure to laboratory light sources

When tested in accordance with the relevant part of ISO 30013 for 600 h, using a cycle including water spray, the cover shall show no signs of cracks or other defects causing the hose to be unserviceable.

Any of the laboratory light sources specified in ISO 30013 can be used. The exposure conditions shall be selected by agreement between the interested parties and be within the capabilities of the type of apparatus used.

8.2.6 Abrasion test

When tested in accordance with ISO 9352, using H22 abrasive wheels to which a load of 9,8 N is applied, the loss in mass of the cover shall not be greater than 2,5 g and there shall be no signs of exposure of the reinforcement after 4 000 revolutions have been completed.

Basic details of the test procedure are given in [Annex A](#).

9 Frequency of testing

Type tests and routine testing shall be as specified in [Annex B](#).

Type tests are those tests required to confirm that a particular hose design, manufactured by a particular method, meets all the requirements of this International Standard. The tests shall be repeated at a maximum of five-year intervals, or whenever a change in the method of manufacture or materials used occurs. They shall be performed on the largest-diameter hose of each design and each type in the manufacturer's range.

Routine tests are those tests required to be carried out on each length of finished hose prior to dispatch.

Production acceptance tests are those tests, specified in [Annex C](#), which should preferably be carried out to control the quality of manufacture. The tests specified in [Annex C](#) are given as a guide only.

10 Test certificate/report

A test report, if requested by the customer, shall be supplied.

11 Marking

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

- a) the manufacturer's name or trademark, e.g. MAN;
- b) the number and year of publication of this International Standard, i.e. ISO 8029:2014;

- c) the type of hose, e.g. Type A;
- d) the inside diameter, e.g. 40;
- e) the maximum working pressure at 23 °C, e.g. 0,4 MPa and/or 4,0 bar; and
- f) the quarter and last two digits of the year of manufacture, e.g. 2Q14.

EXAMPLE MAN/ISO 8029:2014/Type A/40/0,4 MPa/2Q14.

12 Recommendations for packaging and storage

These are given in ISO 8331.

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Annex A (normative)

Abrasion test

A.1 General

This annex specifies a general method for determining the resistance to abrasive wear of plastics test pieces under the action of abrasive wheels. It is equally applicable to moulded test pieces, components and finished products.

A.2 Procedure

A test piece is placed on a motor-driven rotating disc. A pair of abrasive wheels which can turn freely on their axis are placed on the test piece at a specified position under a specified load (in this case 9,8 N). [Figure A.1](#) illustrates the relative positions of these different components.

A minimum of three test pieces shall be tested.

For hoses with a bore equal to or greater than 31,5 mm, the test pieces shall be discs of nominal diameter 100 mm cut from the hose wall.

For hoses with a bore equal to or less than 25 mm, the test pieces shall be octagons prepared from moulded sheet by cutting 100 mm squares from the sheet and cutting off the corners of the squares. The thickness of the sheets shall be uniform and between 0,5 mm and 10 mm.

The test piece surface shall be cleaned with the aid of a suitable neutral volatile solvent or mild soap solution that will not damage the surface.

The test shall be performed in an enclosure at $(23 \pm 2) ^\circ\text{C}$ and $(50 \pm 5) \%$ relative humidity or in an environmentally controlled room under the same conditions.

Fit a weighed test piece to the test piece carrier disc. Fit the apparatus with H22 abrasive wheels. Adjust the loading of each abrasive wheel to 9,8 N, using the counterweights and additional weights provided.

Adjust the position of the dust-removal suction device.

Set the number of revolutions to 4 000.

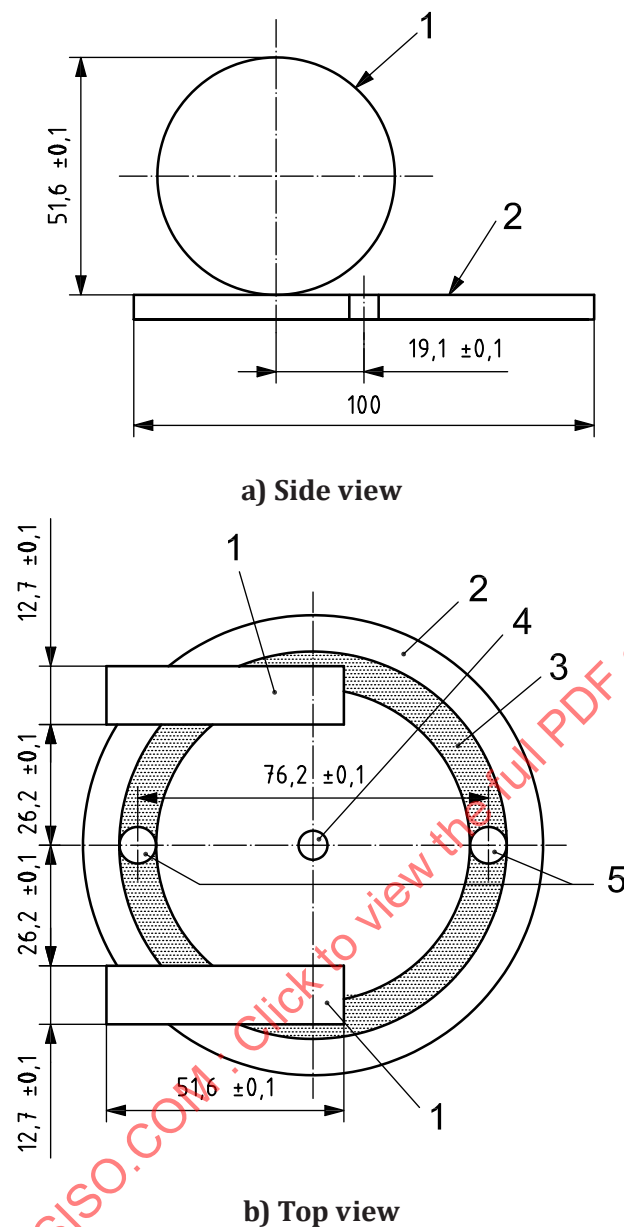
Start the motor driving the rotating disc and the suction system.

When 4 000 revolutions have been completed, stop the motor, remove the test piece and reweigh the test piece. In addition, examine it for any signs of exposure of the reinforcement.

A.3 Assessment and calculation of results

In none of the at least three test pieces tested shall the hose wall reinforcement be visible at the surface of the test piece.

Report the result obtained for each individual test piece, and the mean value of these results.



Key

- 1 abrasive wheel
- 2 test piece
- 3 wear zone
- 4 hole (diameter 6,35 mm)
- 5 vacuum nozzles [diameter $(8 \pm 0,5)$ mm]

Figure A.1 — Diagrammatic arrangement of apparatus

Annex B (normative)

Type and routine testing

[Table B.1](#) gives the tests to be carried out for type approval and routine testing.

Table B.1 — Tests to be carried out for type approval and routine testing

Dimension/property determined (with reference to relevant subclause)	Type test	Routine test
Inside diameter/tolerance (7.1)	X ^a	X
Tolerance on length (7.2)	X	X
Tensile strength and elongation at break of lining and cover (8.1)	X	N.A. ^b
Tensile strength after ageing (8.1)	X	N.A.
Burst pressure test at 23 °C (8.2.1) and 55 °C (8.2.2)	X	N.A.
Change in length and diameter at maximum working pressure (8.2.1)	X	X
Proof pressure test at 23 °C (8.2.1) and 55 °C (8.2.2)	X	X
Adhesion test (8.2.3)	X	N.A.
Bending test at (23 ± 2) °C and (–10 ± 2) °C (8.2.4)	X	N.A.
Exposure to laboratory light sources (8.2.5)	X	N.A.
Abrasion test (8.2.6)	X	N.A.
^a X = Test required. ^b N.A. = Not applicable.		