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Plastic hoses — Textile-reinforced types for compressed-air applications — Specification

*Tuyaux en plastique — Types armés de textile pour applications avec de l'air comprimé —
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 of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 1, *Rubber and plastics hoses and hose assemblies*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 218, *Rubber and plastics hoses and hose assemblies*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This fifth edition cancels and replaces the fourth edition (ISO 5774:2016), which has been technically revised.

The main changes are as follows:

- Clause 2 has been updated;
- the units have been revised and ~~addition of the~~ unit of pressure has been added;
- Clause 10 on marking has been updated.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This ~~International Standard~~document has been prepared to provide minimum acceptable requirements for the satisfactory performance of flexible thermoplastics hoses, textile reinforced, for compressed-air applications.

Some hose materials ~~will~~ require a hydrolysis test (given in Annex A).

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PlasticPlastics hoses — Textile-reinforced types for compressedaircompressed-air applications — Specification

1 Scope

This document specifies the requirements for four types of flexible thermoplastic hose, textile reinforced, for compressed-air applications in the temperature range from $-10\text{ }^{\circ}\text{C}$ to $+60\text{ }^{\circ}\text{C}$.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

ISO 105-A02, *Textiles — Tests for colour fastness — Part A02: Grey scale for assessing change in colour*

ISO 176:2005, *Plastics — Determination of loss of plasticizers — Activated carbon method*

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 1817, *Rubber, vulcanized or thermoplastic — Determination of the effect of liquids*

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

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

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

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

ISO 10619-2:2021, *Rubber and plastics hoses and tubing — Measurement of flexibility and stiffness — Part 2: Bending tests at sub-ambient temperatures*

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.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

4 Classification

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

- Type A: General industrial use —= light service —= for a maximum working pressure of 0,7 MPa (7 bar) at 23 °C and 0,45 MPa (4,5 bar) at 60 °C.
- Type B: General industrial use —= medium service —= for a maximum working pressure of 1 MPa (10 bar) at 23 °C and 0,65 MPa (6,5 bar) at 60 °C.
- Type C: Heavy service —= for a maximum working pressure of 1,6 MPa (16 bar) at 23 °C and 1,1 MPa (11 bar) at 60 °C.
- Type D: Heavy service —= for use in mining and outdoor work —= for a maximum working pressure of 2,5 MPa (25 bar) at 23 °C and 1,3 MPa (13 bar) at 60 °C.

The hoses are not intended for the transport of oil. However, compressed air coming from a compressor can contain some oil in suspension.

5 Couplings and end fittings

Hoses may be fitted with the appropriate coupling type and end fitting to form hose assemblies.

NOTE Guidance on coupling type is given in Annex D and ISO/TR 17784.

6 Materials and construction

The hoses shall consist of:

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

The lining and the cover shall be of uniform thickness, concentric, fully gelled and free from visible cracks, porosity, foreign inclusions and any other defects which ~~could~~can cause the hose to be unserviceable.

7 Dimensions and tolerances

7.1 Inside diameter, tolerances and minimum wall thickness

When measured in accordance with ISO 4671, the inside diameter of hoses shall lie within the tolerance limits given in Table 1 and the wall thickness shall meet the minimum ~~requirement~~requirements given in Table 1.

Table 1 — Nominal bores, inside diameters, tolerances and minimum wall thicknesses

Nominal bore	Inside diameter mm	Tolerance mm	Minimum wall thickness mm			
			Type A	Type B	Type C	Type D
4	4	±0,25	1,5	1,5	1,5	2,0
5	5	±0,25	1,5	1,5	1,5	2,0
6,3	6,3	±0,25	1,5	1,5	1,5	2,3
8	8	±0,25	1,5	1,5	1,5	2,3
9	8,5	±0,25	1,5	1,5	1,5	2,3
10	9,5	±0,35	1,5	1,5	1,8	2,3
12,5	12,5	±0,35	2,0	2,0	2,3	2,8
16	16	±0,5	2,4	2,4	2,8	3,0
19	19	±0,7	2,4	2,4	2,8	3,5
25	25	±1,2	2,7	3,0	3,3	4,0
31,5	31,5	±1,2	3,0	3,3	3,5	4,5
38	38	±1,2	3,0	3,5	3,8	4,5
40	40	±1,5	3,3	3,5	4,1	5,0
50	50	±1,5	3,5	3,8	4,5	5,0

7.2 Concentricity

When determined in accordance with ISO 4671, the concentricity, based on the difference in indicator reading between the inside surface of the lining and the outside surface of the cover, shall be (as given in Table 2):

- no greater than 0,3 mm for hoses of minimum wall thickness from 1,5 mm up to and including 3,0 mm;
- no greater than 10 % of the wall thickness for hoses of minimum wall thickness over 3,0 mm and up to and including 5,0 mm, ~~and no greater than 15 % of the wall thickness for hoses of minimum wall thickness over 5,0 mm as given in Table 2.~~
- no greater than 15 % of the wall thickness for hoses of minimum wall thickness over 5,0 mm.

Table 2 — Concentricity

Minimum wall thickness mm	Concentricity
1,5 to 3,0	≤ 0,3 mm
over 3,0 to 5,0	≤ 10 % of wall thickness
over 5,0	≤ 15 % of wall thickness

7.3 Tolerances on length

The tolerances on cut lengths of hose shall be in accordance with ISO 1307.

8 Physical properties

8.1 Plastic compounds

8.1.1 Tensile strength and elongation at break of lining and cover

When determined in accordance with ISO 37, the tensile strength and elongation at break shall not be less than the values given in Table 3.

Testing shall be carried out either on test pieces taken from the hose wall or on test pieces taken from a sheet of hose material made using a laboratory press.

Table 3 — Tensile strength and elongation at break

Hose component	Minimum tensile strength MPa	Minimum elongation at break %
Lining	15,0	250
Cover	15,0	250

~~Testing shall be carried out either on test pieces taken from the hose wall or on test pieces taken from a sheet of hose material made using a laboratory press.~~

8.1.38.1.2 Resistance to ageing

After ageing for ~~7~~seven days at a temperature of (70 ± 2) °C in accordance with ISO 188, the tensile strength and elongation at break of the lining and cover, as determined by ISO 37, shall not vary by more than the values given in Table 4 in comparison with the values of these properties before ageing.

Table 4 — Change in tensile strength and elongation from original value

Hose component	Change in tensile strength from original value %	Change in elongation at break from original value %
Lining	15	25
Cover	15	25