
**Plastics hoses, textile-reinforced,
for compressed air — Specification**

Tuyaux en plastique armés de textile pour l'air comprimé — Spécifications



Foreword

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International Standard ISO 5774 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 1, *Hoses (rubber and plastics)*.

This second edition cancels and replaces the first edition (ISO 5774:1980), of which it constitutes a technical revision.

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Plastics hoses, textile-reinforced, for compressed air — Specification

1. Scope

This International Standard specifies the requirements for four types of flexible textile reinforced thermoplastics hoses for use up to a maximum working pressure of 25 bar (2,5 MPa) at 23 °C, for application in a temperature range from -10 °C to +60 °C.

Note -At temperatures above 23 °C and particularly above 40 °C the maximum working pressure will be reduced.

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 105 : A02 : 1993	Textiles - Tests for colour fastness - Part A02 : Grey Scales for assessing change in colour
ISO 176 : 1976,	Plastics - Determination of loss of plasticizers - Activated carbon method.
ISO 188 : 1982,	Rubber, vulcanized - Accelerated ageing or heat resistance tests.
ISO 1307 : 1992,	Rubber and plastics hose for general purpose industrial applications - Bore diameters and tolerances on length.
ISO 1402 : 1994,	Rubber and plastics hoses and hose assemblies - Hydrostatic testing.
ISO 1746 : 1983,	Rubber or plastics hoses - Bending tests.
ISO 1817 : 1985,	Rubber, vulcanized - Determination of the effect of liquids.
ISO 4672 : 1988,	Rubber and plastics hoses - Sub-ambient temperature flexibility tests.
ISO 7751 : 1991,	Rubber and plastics hoses and hose assemblies - Ratios of proof and burst pressure to design working pressure.
ISO 8033 : 1991,	Rubber and plastics hose - Determination of adhesion between components.
ISO 11758 : 1995	Rubber and plastics hoses - Exposure to a xenon arc lamp - Determination of changes in colour and appearance

3. Types of hose

Four types of hose are specified, as follows:

Type A : General industrial use - light service - for a working pressure of 10 bar (1,0 MPa);

Type B : Heavy service - for a working pressure of 10 bar (1,0 MPa);

Type C : Heavy service - for a working pressure of 16 bar (1,6 MPa);

Type D : Heavy service - mining, outdoor work - for a working pressure of 25 bar (2,5 MPa).

The minimum burst pressure of all Types shall exceed the working pressure by 4 x, in accordance with ISO 7751.

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

4. Construction and materials

Hoses shall be as uniform as is commercially practicable in colour, opacity and other physical properties, and shall consist of:

- a flexible lining of thermoplastics, which, for Types B, C and D, shall be oil resistant (see 6.4);
- a flexible layer, or layers, of natural or synthetic textile, applied by any suitable technique;
- a flexible thermoplastic cover which may have a smooth or fluted finish. The colour may be different from that of the lining.

The cover and lining shall be fully gelled and free from visible cracks, porosity, foreign inclusions or other defects causing the hose to be unserviceable.

5. Dimensions and tolerances

5.1 Bore size and wall thickness

The nominal bore, internal diameter and tolerances and minimum wall thickness shall be in accordance with the values given in table 1.

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

Nominal bore	Internal diameter	Tolerance	Dimensions in millimetres			
			Minimum wall thickness			
			Type A	Type B	Type C	Type D
6,3	6,3	$\pm 0,75$	2,0	2,1	2,3	2,5
8	8	$\pm 0,75$	2,0	2,1	2,3	2,5
10	10	$\pm 0,75$	2,0	2,1	2,5	2,8
12,5	12,5	$\pm 0,75$	2,5	2,5	2,8	3,0
16	16	$\pm 0,75$	2,8	2,8	2,8	3,0
19	19	$\pm 0,75$	3,0	3,0	3,2	3,5
25	25	$\pm 1,25$	3,5	3,5	3,5	4,0
31,5	31,5	$\pm 1,25$	-	4,0	-	-
38	38	$\pm 1,50$	-	4,5	-	-
40	40	$\pm 1,50$	-	5,0	-	-
50	50	$\pm 1,50$	-	6,5	-	-

NOTE - For smaller or larger dimensions, further numbers should be chosen from the R10 series of preferred numbers (see ISO 3), with tolerances as specified in ISO 1307.

For intermediate dimensions, numbers should be chosen from the R20 series of preferred numbers (see ISO 3), with the tolerances as given for the next larger size.

5.2 Length

The tolerance on cut lengths of hose shall be in accordance with the values given in table 2.

Table 2 - Tolerances on length

Dimensions in millimetres	
Length	Tolerance
Up to 300	± 3
301 to 600	$\pm 4,5$
601 to 900	± 6
901 to 1200	± 9
1201 to 1800	± 12
Over 1800	$\pm 1 \%$

6. Physical properties of lining and cover materials

6.1 Tensile strength and elongation at break of lining and cover

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

Table 3 - Tensile strength and elongation at break

Hose component	Tensile strength MPa	Elongation at break %
Lining	>10	>250
Cover	>10	>250

6.2 Accelerated ageing

After ageing for 7 days at a temperature of $70 \text{ }^{\circ}\text{C} \pm 2 \text{ }^{\circ}\text{C}$, as specified in 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 same values before ageing.

Table 4 - Tensile strength and elongation at break after ageing

Hose component	Tensile strength	Elongation at break
Lining	<15 %	<25 %
Cover	<15 %	<25 %

6.3 Loss in mass on heating

When tested in accordance with Method B of ISO 176, materials of the lining and cover shall have a loss in mass not greater than 2 %.

6.4 Resistance to liquids (types B, C and D lining only)

After immersion in Oil No 1 as described in ISO 1817 at $(60 \pm 2)^\circ\text{C}$ for 72 h, the volume of a test piece shall not vary by more than 15 %.

7. Performance requirements of finished hose

7.1 Hydrostatic requirements

When tested at $23^\circ\text{C} \pm 2^\circ\text{C}$ in accordance with ISO 1402, the hose shall meet the values given in table 5.

Table 5. Hydrostatic pressure requirements

Hose type	Working pressure bar ¹⁾	Proof pressure bar	Minimum bursting pressure bar	Change in dimensions at proof pressure	
				Length	Diameter
A and B	10	20	40	$\pm 8 \%$	$\pm 10 \%$
C	16	32	64	$\pm 8 \%$	$\pm 10 \%$
D	25	50	100	$\pm 8 \%$	$\pm 10 \%$

¹⁾ 1 bar = 0,1 MPa

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

When tested at $60\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ the minimum burst pressure values shall be as follows:

Type A : 24 bar

Type C : 45 bar

Type B : 26 bar

Type D : 50 bar

7.2 Adhesion

When tested in accordance with ISO 8033, the adhesion between lining and cover shall not be less than 1,5 kN/m for all four types.

7.3 UV resistance (Xenon arc lamp)

When tested according to ISO 11758, the cover shall show no evidence of cracking or change of colour. After testing, when comparing the samples to the Grey Scale, the minimum acceptable degree shall be 4. (See ISO 105 : A02).

7.4 Minimum bend radius

When tested at $23\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$ in accordance with ISO 1746, with $c = 10 \times$ nominal bore, the hose shall not show a deformation coefficient higher than 0,8.

7.5 Low temperature flexibility

When tested at $-10\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ in accordance with Method B of ISO 4672, the hose shall be capable of being bent around a mandrel with a radius of twice the bend radius specified in 7.4.

No cracks shall be detected and the hose shall pass the proof pressure test in 7.1 at $23\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$.

8. Marking

The hose shall be marked with the following information:

- a) the manufacturer's name or trademark;
- b) the number of this International Standard;
- c) the nominal bore, e.g. 16;
- d) the hose type and working pressure, e.g. A/10;
- e) the quarter and the year of manufacture e.g. 4Q97.

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