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Industrial rubber hose for compressed air (up to 2,5 MPa)

Tuyaux en caoutchouc à usage industriel pour l'air comprimé (jusqu'à 2,5 MPa)

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Reference number
ISO 2398 : 1987 (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.

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. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 2398 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*.

This third edition cancels and replaces the second edition (ISO 2398 : 1978), of which it constitutes a minor revision.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

Industrial rubber hose for compressed air (up to 2,5 MPa)

1 Scope and field of application

This International Standard specifies requirements for six types of rubber hose for compressed air as follows:

Type A — Industrial air hose for a maximum working pressure of 1,0 MPa (10 bar).

Type B — Air hose for mining and construction work and maximum working pressure of 1,0 MPa (10 bar).

Type B1 — Air hose for mining, other than coal mining, and construction work, maximum working pressure of 1,0 MPa (10 bar) and having good oil resistance.

Type C — Air hose for mining and construction work and maximum working pressure of 1,6 MPa (16 bar).

Type D — Air hose for mining and construction work and maximum working pressure of 2,5 MPa (25 bar).

Type D1 — Air hose for mining, other than coal mining, and construction work, maximum working pressure of 2,5 MPa (25 bar) and having good oil resistance.

For Type A hoses, the ratios of proof and minimum burst pressures to design working pressure are in accordance with ISO 7751 Service Type No. 3.

For Type B, B1, C, D and D1 hoses the ratios of proof and minimum burst pressures to design working pressure are in accordance with ISO 7751 Service Type No. 4.

2 References

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

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

ISO 1307, *Rubber and plastics hoses — Bore diameters and tolerances on length.*

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

ISO 1817, *Rubber, vulcanized — Determination of the effect of liquids.*

ISO 7751, *Rubber and plastics hoses and hose assemblies — Ratios of proof and burst pressure to design working pressure.*

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

3 Dimensions and tolerances

NOTE — Suggested outside diameters for the heavier duty hoses are given in the annex. Details of the outside diameters of light duty air hoses are seldom required.

3.1 Bore

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

3.2 Cover

For Type B, B1, C, D and D1 hoses, the cover thickness shall be in accordance with table 1.

Table 1 — Nominal bore and thickness of cover

Values in millimetres

Type A		Types B, B1, C, D and D1		
Nominal bore	Tolerance	Nominal bore	Tolerance	Minimum thickness of cover
5	±0,5	—	—	—
6,3	±0,75	—	—	—
8	±0,75	—	—	—
10	±0,75	—	—	—
12,5	±0,75	12,5	±0,75	1,5
16	±0,75	16	±0,75	1,5
20	±0,75	20	±0,75	1,5
25	±1,25	25	±1,25	1,5
31,5	±1,25	31,5	±1,25	2,0
40	±1,5	40	±1,5	2,0
50	±1,5	50	±1,5	2,0
—	—	63*	±1,5	2,0
—	—	80*	±2	2,0
—	—	100*	±2	2,0

* For Types B, B1 and C hoses.

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 with tolerances as given in ISO 1307;

b) for intermediate dimensions numbers should be chosen from the R 20 series of preferred numbers, with the tolerances as given for the next larger bore size.

3.3 Lengths

For cut lengths the tolerances shall be in accordance with ISO 1307.

4 Physical requirements for finished hose

4.1 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 described in ISO 37, have a tensile strength and elongation at break not less than the values given in table 2.

Table 2 – Tensile strength and elongation at break

Type	Component	Tensile strength MPa	Elongation at break %
A	Lining	5,0	200
	Cover	7,0	250
B, B1, C, D and D1	Lining	7,0	250
	Cover	10,0	300

4.2 Accelerated ageing

After ageing for 168 h at a temperature of 70 °C as described 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.

4.3 Hydrostatic requirement

The hose, when tested by the method described in ISO 1402, shall meet the requirements specified in table 3.

Table 3 – Hydrostatic requirements

Type	Design working pressure MPa	Proof test pressure MPa	Change in diameter at proof test pressure %	Change in length at proof test pressure %	Minimum bursting pressure MPa
A	1,0	2,0	*	*	4,0
B and B1	1,0	2,5	±10	±8	5,0
C	1,6	4,0	±10	±8	8,0
D and D1	2,5	6,3	±10	±8	12,5

* No requirement.

4.4 Adhesion

When tested in accordance with ISO 8033 the minimum adhesion between rubber lining and reinforcement, between layers of reinforcement, and between reinforcement and cover, shall be not less than 1,5 kN/m for Type A and 2,0 kN/m for all other types.

4.5 Resistance to liquids

4.5.1 Types A, B, C and D

After immersion in Oil No. 1 described in ISO 1817, at 70 ± 1 °C for 72 $\frac{0}{-2}$ h, specimens of the lining shall show no shrinkage and the increase in volume shall not exceed 15 % when determined according to the gravimetric method specified in ISO 1817. This requirement is optional for Type A hose.

4.5.2 Types B1 and D1

After immersion in Oil No. 3 described in ISO 1817, at 70 ± 1 °C for 72 $\frac{0}{-2}$ h, specimens of the lining and cover shall show no shrinkage and the increase in volume shall not exceed 30 % for the lining and 75 % for the cover, when determined according to the gravimetric method specified in ISO 1817.

5 Marking

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

Annex

Suggested outside diameters for heavier duty hoses

(This annex forms an integral part of the standard.)

Values in millimetres

Nominal bore	Outside diameter		Tolerance
	Types B and B1	Types C, D and D1	
12,5	22,5	22,5	± 1,25
16	26	26	± 1,25
20	32,6	32,6	± 1,25
25	37,6	37,6	± 1,5
31,5	44,1	47,5	± 1,5
40	52,6	56	± 1,75
50	66	70	± 1,75
63	79	83	± 1,75
80	96	100	± 2
100	116	124	± 2

NOTE — The outside diameters are calculated from the nominal bore and a wall thickness chosen from the R 10 series of preferred numbers.

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