INTERNATIONAL STANDARD

ISO 3949

Second edition
1991-11-15

Plastics hoses and hose assemblies — Thermoplastics, textile-reinforced, hydraulic type — Specification

Tuyaux et flexibles en plastique — Type hydraulique en thermoplastiques à armature textile — Spécifications

Reference number
ISO 3949:1991(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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 3949 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Sub-Committee SC 1, *Hoses (rubber and plastics)*.

This second edition cancels and replaces the first edition (ISO 3949:1980), of which it constitutes a technical revision.

Annex A forms an integral part of this International Standard.

International Organization for Standardization
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

Plastics hoses and hose assemblies — Thermoplastics, textile-reinforced, hydraulic type — Specification

1 Scope

This International Standard specifies requirements for two types of thermoplastics hose with textile reinforcement, with design working pressures in the range 6,9 MPa to 34,5 MPa. The hoses are suitable for use with petroleum, water and synthetic-based hydraulic fluids within a temperature range of − 40 °C to + 100 °C.

The Standard does not include requirements for end fittings. It is limited to the performance of hoses and hose assemblies.

NOTE 1 Operating temperatures in excess of 93 °C may reduce the life of the hose.

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 1307:1983, *Rubber and plastics hoses — Bore diameters and tolerances on length.*

ISO 1402:1984, *Rubber and plastics hoses and hose assemblies — Hydrostatic testing.*

ISO 1817:1985, *Rubber, vulcanized — Determination of the effect of liquids.*

ISO 4671:1984, *Rubber and plastics hose and hose assemblies — Methods of measurement of dimensions.*

ISO 4672:1988, *Rubber and plastics hoses — Sub-ambient temperature flexibility tests.*

ISO 6803:1984, *Rubber or plastics hoses and hose assemblies — Hydraulic pressure impulse test without flexing.*

ISO 7326:1991, *Rubber and plastics hoses — Assessment of ozone resistance under static conditions.*

ISO 7751:—[1], *Rubber and plastics hoses and hose assemblies — Ratios of proof and burst pressure to design working pressure.*

3 Types

Two types of hose are specified, type 1 and type 2, characterized by the design working pressures given in table 2.

4 Materials and construction

4.1 The hose shall consist of a seamless thermoplastics lining resistant to hydraulic fluids, with a suitable synthetic-fibre reinforcement and a thermoplastics cover resistant to hydraulic fluids and the weather.

4.2 The hose shall be uniformly constructed so that the measurement, in accordance with ISO 4671, of the wall thickness at different points shall not differ by more than the values given in table 1.

1) To be published. (Revision of ISO 7751:1983)

Table 1 — Maximum permitted variation in wall thickness

Values in millimetres

Nominal bore	Difference in thickness
Up to and including 6,3	0,8
Over 6,3 and up to and including 19	1,0
Over 19	1,3

5 Dimensions

The bore diameter of the hose shall comply with the requirements of table 2, when measured in accordance with ISO 4671.

Table 2 — Nominal bore, tolerances and maximum outside diameters

Dimensions in millimetres

Nominal bore	Diameter range				Maximum outside diameter	
	Type 1		Type 2			
	min.	max.	min.	max.	Type 1	Type 2
5	4,6	5,4	4,6	5,4	11,4	14,6
6,3	6,2	7,0	6,2	7,0	13,7	16,8
8	7,7	8,5	—	—	15,6	—
10	9,3	10,3	9,3	10,3	18,4	20,3
12,5	12,3	13,5	12,3	13,5	22,5	24,6
16	15,5	16,7	15,5	16,7	25,8	29,8
19	18,6	19,8	18,6	19,8	28,6	33,0
25	25,0	26,4	25,0	26,4	36,7	38,6

NOTE 2 ISO 1307 has not been followed for nominal bore or permitted range; the dimensions adopted in table 2 are to ensure compatibility with fittings which are in wide use throughout the world.

6 Hydrostatic requirements

6.1 The design working pressure, proof test pressure and minimum burst pressure of the hose shall comply with the requirements of table 3 in accordance with category 3 of ISO 7751, i.e. the proof pressure shall be twice the design working pressure, and the minimum burst pressure four times the design working pressure.

6.2 The hose shall withstand without damage a proof test pressure as shown in table 3, maintained for a period of 1 min by the method specified in ISO 1402.

Table 3 — Design working pressure, proof test pressure and minimum burst pressure

Pressures in megapascals

Nominal bore	Design working pressure		Proof test pressure		Minimum burst pressure	
mm	Type 1	Type 2	Type 1	Type 2	Type 1	Type 2
5	20,5	34,5	41,0	69,0	82,0	138,0
6,3	19,0	34,5	38,0	69,0	76,0	138,0
8	17,0	—	34,0	—	68,0	—
10	15,5	27,5	31,0	55,0	62,0	110,0
12,5	13,5	24,0	27,0	48,0	54,0	96,0
16	10,0	19,0	20,0	38,0	40,0	76,0
19	8,6	15,5	17,2	31,0	34,4	62,0
25	6,9	13,8	13,8	27,5	27,6	55,0

7 Minimum bend radius and change in length at design working pressure

7.1 The hose shall be capable of performing at design working pressure when curved to a radius not less than that in table 4, measured on the inside of the bend. A hose shall not be installed for use at the design working pressure if a smaller bend radius is used than shown in table 4.

NOTE 3 Should any portion of the hose be curved to a radius less than the specified minimum bend radius, the performance capability of the hose will be reduced.

7.2 The change in length of the hose at the design working pressure shall not be greater than that specified in table 4.

Table 4 — Minimum bend radius and maximum permitted change in length

Nominal bore	Minimum bend radius	Change in length
mm	mm	%
5	90	± 3
6,3	100	± 3
8	115	± 3
10	125	± 3
12,5	180	± 3
16	205	± 3
19	240	± 3
25	300	± 3