INTERNATIONAL STANDARD

ISO 6808

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Plastics hoses and hose assemblies for suction and low-pressure discharge of petroleum liquids — Specification

Tuyaux et flexibles en plastique pour aspiration et refoulement basse pression des liquides pétroliers — Spécifications

Reference numbe

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 6808 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 6808:1984), which has been technically revised.

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Introduction

This International Standard has been prepared to provide minimum acceptable requirements for the satisfactory performance of polymer-reinforced thermoplastics hoses for suction and discharge applications, conveying kerosene, heating oil, diesel fuel and lubricating oils. These hoses are not suitable for conveying automotive or aviation fuel, nor for metered delivery of any liquid.

The list of nominal bores given in Tables 1 and 2 is not intended to be restrictive and will not preclude the manufacture of sizes outside the preferred-number range (the basis of the tables) and which may be the subject of individual national standards.

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WARNING — Persons using this International Standard should be familiar with normal laboratory practice. This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

1 Scope

This International Standard specifies the requirements for two types of polymer-reinforced thermoplastics hose and hose assembly for suction and discharge applications with kerosene, heating oil, diesel fuel and lubricating oils in the temperature range – 10 °C to + 45 °C.

NOTE The hoses can be stored in a static condition at – 30 °C to + 65 °C without damage by climatic conditions.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 3:1973, *Preferred numbers — Series of preferred numbers.*

ISO 176:1976, *Plastics — Determination of loss of plasticizers — Activated carbon method.*

ISO 188:1998, *Rubber, vulcanized or thermoplastic — Accelerated ageing and heat resistance tests.*

ISO 471:1995, *Rubber — Temperatures, humidities and times for conditioning and testing.*

ISO 527-3:1995, *Plastics — Determination of tensile properties — Part 3: Test conditions for films and sheets.*

ISO 868:1985, *Plastics and ebonite — Determination of indentation hardness by means of a durometer (Shore hardness).*

ISO 1307:1992, *Rubber and plastics hoses for general-purpose industrial applications — Bore diameters and tolerances, and tolerances on length.*

ISO 1402:1994, *Rubber and plastics hoses and hose assemblies — Hydrostatic testing.*

ISO 1746:1998, *Rubber or plastics hoses and tubing — Bending tests.*

ISO 1817:1999, *Rubber, vulcanized — Determination of the effect of liquids.*

ISO 4672:1997, *Rubber and plastics hoses — Sub-ambient temperature flexibility tests.*

ISO 7233:1991, *Rubber and plastics hoses and hose assemblies — Determination of suction resistance.*

ISO 7751:1991, *Rubber and plastics hoses and hose assemblies — Ratios of proof and burst pressure to design working pressure.*

ISO 8031:1993, *Rubber and plastic hoses and hose assemblies — Determination of electrical resistance.*

3 Classification

Two types of hose are specified, differentiated by the working pressure as follows:

Type 1: for light service, having a maximum working pressure of 3 bar[1)] at 23 °C ± 2 °C and 2,3 bar at 45 °C ± 2 °C;

Type 2: for normal service, having a maximum working pressure of 5,5 bar or 4 bar at 23 °C ± 2 °C and 4 bar or 3 bar at 45 °C ± 2 °C, depending on the nominal bore.

4 Construction and materials

The hoses shall be as uniform as commercially practicable in colour, opacity and other physical properties. Flexible thermoplastics materials shall be supported inside the material by a helix of polymeric material of a similar molecular structure. The reinforcing and flexible components of the wall shall be fused and free from visible cracks, porosity, foreign inclusions or other defects causing the hose to be unserviceable. Hose assemblies shall be electrically bonded between couplings. Electrical continuity may be ensured by an antistatic strip welded along the hose on its outer surface. The antistatic strip may consist of a braided copper wire coated with suitable plastics material and shall be anchored to the metal couplings in a manner that will ensure reliable electrical continuity throughout the life of the hose.

The method of ensuring initial electrical continuity shall be the responsibility of the manufacturer and shall be carried out to the satisfaction of the user.

5 Dimensions and tolerances

5.1 Diameter

The nominal bore of the hose and the internal diameter and tolerances shall be in accordance with the values given in Tables 1 and 2, which are in accordance with ISO 1307.

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1) 1 bar = 0,1 MPa

Table 1 — Diameters and tolerances (Type 1 hoses)

Nominal bore	Internal diameter mm	Tolerance mm
12,5	12,5	± 0,75
16	16	± 0,75
19	19	± 0,75
20	20	± 0,75
25	25	± 1,25
31,5	31,5	± 1,25
38	38	± 1,25
40	40	± 1,50
50	50	± 1,50
63	63	± 2,00
80	80	± 2,00
100	100	± 2,00
125	125	± 2,00

Table 2 — Diameters and tolerances (Type 2 hoses)

Nominal bore	Internal diameter mm	Tolerance mm
12,5	12,5	± 0,75
16	16	± 0,75
19	19	± 0,75
20	20	± 0,75
25	25	± 1,25
31,5	31,5	± 1,25
38	38	± 1,25
40	40	± 1,50
50	50	± 1,50

NOTE 1 For smaller or larger diameters, it is recommended that values be chosen from the R 10 series of preferred numbers (see ISO 3), with tolerances as specified in ISO 1307.

NOTE 2 For intermediate diameters, it is recommended that values be chosen from the R 20 series of preferred numbers.

5.2 Length

The tolerances on cut lengths of hose shall be as given in Table 3.

Table 3 — Tolerances on cut lengths

Nominal bore	Tolerance on cut length %
Up to and including 40	± 1
Over 40	± 2

6 Physical properties of finished hoses

6.1 Hydrostatic requirements at standard laboratory temperature

When tested at standard laboratory temperature as specified in ISO 471 by the method specified in ISO 1402, the hose shall meet the requirements given in Table 4.

When examined at proof pressure (i.e. 50 % of minimum bursting pressure), the hose shall show no evidence of leakage, cracking, abrupt distortion or electrical-continuity damage.

Table 4 — Hydrostatic requirements at standard temperature

Nominal bore	Working pressure bar		Minimum bursting pressure bar	
	Type 1	Type 2	Type 1	Type 2
Up to and including 25	3	5,5	12	28
From 31,5 up to and including 50	3	4	12	20
From 63,5 up to and including 125	3	—	12	—
NOTE The values given in the table are based on the following ratios: Type 1: 4:1; Type 2: 5:1.				

6.2 Hydrostatic requirements at 55 °C

When tested at 55 °C ± 2 °C by the method specified in ISO 1402, the hose shall meet the requirements given in Table 5.

Table 5 — Hydrostatic requirements at 55 °C (all nominal bores)

Working pressure bar		Minimum bursting pressure bar	
Type 1	Type 2	Type 1	Type 2
0,7	1,5	3	8
NOTE The values given in this table are based on the following ratios: Type 1: 4:1; Type 2: 5:1.			

6.3 Change in length (Type 2 only)

When tested at 23 °C ± 2 °C and 45 °C ± 2 °C by the method specified in ISO 1402, the length of the hose shall not change by more than 15 %.

NOTE Electrical continuity is also tested at this time (see 6.8).

6.4 Suction resistance

When tested at 23 °C ± 2 °C and 45 °C ± 2 °C in accordance with the method specified in ISO 7233, using an internal pressure (less than atmospheric pressure) of 0,650 bar for Type 1 and 0,800 bar for Type 2, the hose shall not fail due to collapse or fracture at any point that is more than one diameter distance from the coupling.

In the event of failure closer than one diameter distance to the coupling, the test shall be disregarded and a further test piece shall be tested.

6.5 Reinforcement fracture

6.5.1 When tested in accordance with the method specified in annex A, extended over the appropriate-size extension block given in Table 6 for 4 months for a type test, or 336 h for a control test, the helical reinforcement shall be capable of reverse bending without cracking.

6.5.2 When the hose is tested, after immersion in Oil No. 3 as defined in ISO 1817 for (72^{0}_{-2}) h at 70 °C ± 1 °C, in accordance with the method specified in annex A, over the appropriate-size extension piece given in Table 6 for 336 h, the helical reinforcement shall be capable of reverse bending without cracking.

Table 6 — Width of extension block used for reinforcement-fracture test

Nominal bore	Block width, W mm
12,5	10
16	12
19	16
20	16
25	19
31,5	23
38	27
40	27
50	31
63	34
80	38
100	44
125	49