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Rubber hoses and hose assemblies for use in oil burners — Specification

Tuyaux et flexibles en caoutchouc pour brûleurs à fuel — Spécifications

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Foreword

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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 document 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).

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This document was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products, Subcommittee*, 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 6806:2017), which has been technically revised.

The main changes are as follows:

- the normative reference has been updated ([Clause 2](#));
- the normative reference has been updated ([7.4](#));
- the ozone resistance requirement has been modified ([7.6](#));
- the marking has been changed to the nominal size and add example ([Clause 10](#));
- the internal diameter has been changed to the inside diameter ([Annex C](#) and [Annex D](#));
- the value of the water pressure has been changed ([Annex E](#));
- the external diameter has been changed to the outside diameter ([Annex F](#)).

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.

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Rubber hoses and hose assemblies for use in oil burners — Specification

1 Scope

This document specifies the minimum requirements for rubber hoses and hose assemblies for use in oil burners.

The following two types of hose assembly are specified:

- Type 1: Hose assemblies for flux and reflux, but not for insertion between the oil burner pump and the atomizing connection; maximum working pressure 1,0 MPa (10 bar); maximum oil temperature 100 °C;
- Type 2: Hose assemblies for insertion between the oil burner pump and the atomizing connection; maximum working pressure 4,0 MPa (40 bar); maximum oil temperature 100 °C.

The hose assemblies specified in this document are not intended to be used, without special assessment, for purposes other than oil burner installations.

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 48-2, *Rubber, vulcanized or thermoplastic — Determination of hardness (hardness — Part 2: Hardness between 10 IRHD and 100 IRHD)*

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 7326, *Rubber and plastics hoses — Assessment of ozone resistance under static conditions*

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

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8330 apply.

ISO and IEC maintain [terminological 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 Construction

Hoses in accordance with this document shall consist of either:

- a) an internally smooth rubber lining and an external corrosion-resistant metal braid, or;
- b) an internally smooth rubber lining, a reinforcement consisting of one or more layers of textile or corrosion-resistant metal braid and a rubber outer cover.

The hoses shall be fitted with permanently attached couplings.

Both the couplings and the metal braid shall be provided with suitable corrosion protection. The metals used shall not have any deleterious effects on the rubber components.

5 Dimensions and tolerances

5.1 Inside diameter

The inside diameter of the hose shall be in accordance with the dimensions and tolerances given in [Table 1](#), which is in accordance with ISO 1307.

Table 1 — Nominal size

Nominal size	Inside diameter mm	Tolerance mm
5	5	±0,5
6,3	6,3	±0,75
8	8	
10	10	
12,5	12,5	
16	16	±1,25
20	20	
25	25	

5.2 Bend radii

The hoses shall not be used at bend radii, measured at the inside of the bend, smaller than the minimum bend radii specified in [Table 2](#).

Table 2 — Minimum bend radii

Nominal size	Minimum bend radius mm
5	50
6,3	60
8	75
10	80

Nominal size	Minimum bend radius mm
12,5	105
16	120
20	145
25	165

5.3 Thickness of lining and cover

When measured in accordance with ISO 4671, the minimum thickness of the lining and cover shall be not less than 1,7 mm and 1,3 mm, respectively.

6 Physical requirements for lining and cover

When tested in accordance with the methods of test indicated, the lining and cover shall conform with the requirements of [Table 3](#).

Table 3 — Physical requirements for lining and cover

Property	Requirement	Method of test
Oil resistance:		ISO 1817
Volume change:		(72 ⁰ / ₂) h in oil No. 3
— lining	-5 % to +15 %	at 70 °C ± 1 °C for type 1
— cover	-5 % to +60 %	at 125 °C ± 2 °C for type 2
Hardness change after resistance test: ^a		
— lining	±10 IRHD	ISO 48-2

^a No initial hardness is specified, but a limit on hardness change after oil immersion is included to ensure that a lining with adequate oil resistance is employed.

7 Physical requirements for hoses and hose assemblies

7.1 Hydrostatic tests

7.1.1 Proof pressure test

The test shall be carried out in accordance with the method specified ISO 1402 to the proof test pressure specified in [Table 4](#). The hose assembly shall show no signs of leakage or distortion or movement of the couplings.

7.1.2 Burst pressure test

The test shall be carried out in accordance with the method specified ISO 1402. The hose assembly shall show no signs of leakage or failure before the minimum burst pressure specified in [Table 4](#) has been attained.

Table 4 — Hydrostatic pressure requirements

Parameter	Pressure requirements			
	Type 1		Type 2	
	MPa	bar	MPa	bar
Maximum working pressure	1,0	10	4,0	40
Proof test pressure	2,0	20	8,0	80
Minimum burst pressure	4,0	40	16,0	160

7.2 Oil swell

The test shall be carried out in accordance with the method specified in [Annex C](#). The reduction in the inside diameter of the hose shall not exceed 10-%.

7.3 External pressure test

The test shall be carried out in accordance with the method specified in [Annex D](#). The reduction in the outside diameter of the hose shall not exceed 6 %.

7.4 Low-temperature flexibility

The test shall be carried out in accordance with ISO 10619-2:2021, method B at a temperature of $(-40 \pm 2) ^\circ\text{C}$, the hose shall not crack and shall show no signs of leakage when proof pressure is subsequently tested in accordance with [7.1.1](#).

7.5 Flammability

The test shall be carried out in accordance with [Annex E](#). The hose shall show no signs of leakage.

7.6 Ozone resistance (cover only)

The test shall be carried out on the hose itself in accordance with ISO 7326. Bend the hose with the minimum bend radius listed on [Table 2](#) or wind the hose around a cylinder with twice a minimum bend radius. The test shall be carried out using an ozone concentration of (50 ± 5) mPa at $(40 \pm 2) ^\circ\text{C}$ for (72 ± 4) h and there shall be no signs of cracking under $\times 2$ magnification.

7.7 Impulse test

The test shall be in accordance with [Annex F](#). The hose shall show no leakage or damage after completion of 30 000 cycles.

8 Frequency of testing

The minimum frequency of testing shall conform to the schedule given in [Annex A](#).

Type tests are those tests carried out in order to verify that the hose meets all requirements of this document.

Routine tests are those tests carried out on each length of the finished hose.

Production tests are those tests carried out per batch (see schedule given in [Annex B](#), which is for guidance only).