
Rubber and plastics hoses — Method of test for flammability

*Tuyaux en caoutchouc et en plastique — Méthode d'essai
d'inflammabilité*



Reference number
ISO 8030:2014(E)

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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.

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 documents 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information.

The committee responsible for this document is ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 1, *Rubber and plastics hoses and hose assemblies*.

This third edition cancels and replaces the second edition (ISO 8030:1995), which has been technically revised.

The method of test in this edition is now based on a gas burner which has replaced the spirit burner which was specified in the previous edition.

Rubber and plastics hoses — Method of test for flammability

1 Scope

This International Standard specifies a method for assessing the flammability of hoses, except for hoses intended for use with petroleum fuels for combustion engines. The method is restricted to hoses of sizes up to and including nominal bore of 50 mm.

NOTE 1 The user is referred to the applicable hose standard for flame/afterglow requirements.

NOTE 2 The method of test for flammability of hoses for use with petroleum fuels is given in ISO 13774[1].

2 Normative references

The following referenced documents are indispensable for the application 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 8056-1, *Aircraft — Nickel-chromium and nickel-aluminium thermocouple extension cables — Part 1: Conductors — General requirements and tests*

ISO 9162, *Petroleum products — Fuels (class F) — Liquefied petroleum gases — Specifications*

ISO 23529, *Rubber — General procedures for preparing and conditioning test pieces for physical test methods*

3 General

The test specified in this International Standard is a small-scale laboratory test and it is therefore important to note that the results obtained can only be indicative and do not allow the prediction of behaviour in a fire. It is above all a screening or quality control test and has been used for many years to assess the suitability of hoses for underground use in particular.

Attention is drawn to the need for ensuring that the test specified in this International Standard is carried out under suitable environmental conditions and that personnel are adequately protected against risk of fire, and inhalation of smoke and/or toxic products of combustion.

4 Apparatus

4.1 Draught-free cabinet, with, a hole at the top for the escape of fumes, a hand-hole and flap for handling the burner and a sliding door with a viewing panel of toughened soda glass or any suitable transparent material. The arrangement and approximate dimensions of the cabinet are shown in [Figure 1](#).

Alternatively, the test could be done under a laboratory fume chamber.

4.2 Gas burner (Bunsen type), having a burner tube of inside diameter of $(10 \pm 0,5)$ mm, as illustrated in [Figure 2](#).

4.3 Commercial propane gas, as specified in ISO 9162.

4.4 Stand, for supporting the test piece in a horizontal position above the burner (see [Figure 3](#)).

4.5 Timing devices, capable of being read to 0,2 s or less.

4.6 Measuring devices, a scale or tape of around 1 m length with least divisions of 1 mm and calibrated to an appropriate accuracy.

4.7 Calibrated NiCr/NiAl thermo-couple, as specified in ISO 8056-1 or its equivalent.

5 Test piece

The test piece shall be a 300 mm long sample of hose. Six test pieces shall be tested.

6 Conditioning

No test shall be carried out within 24 h of manufacture of the hose. Test pieces shall be conditioned at standard temperature and humidity (see ISO 23529) for at least 3 h before testing. This may be part of the 24 h period after manufacture.

7 Procedure

7.1 Place the test piece in the test rig (see [Figure 3](#)), and then place the test rig in the cabinet (see [Figure 1](#)).

7.2 Light the burner and preheat it for 2 min. Adjust the air and gas flow to give a total flame height of between 150 mm to 180 mm, with an inner flame length of approximately 50 mm.

Position the thermocouple in the hottest part of the flame (i.e. just above the inner flame cone as shown in [Figure 2](#)) and check that the temperature is $1\ 000\ ^\circ\text{C} \pm 20\ ^\circ\text{C}$.

If necessary, adjust the burner flame so that the temperature recorded is $1\ 000\ ^\circ\text{C} \pm 20\ ^\circ\text{C}$.

Other temperatures can be used when specified in the hose product standard.

7.3 Place the burner at 45° (see [Figure 3](#)) at the midpoint position of the test piece with the top of the burner tube approximately 50 mm below the bottom edge of the test piece so that the flame produces the set temperature of $1\ 000\ ^\circ\text{C} \pm 20\ ^\circ\text{C}$ at this point.

7.4 After $60\ \text{s} + 1\ \text{s}$, remove the burner from the test rig, record the duration of flame persistence and the afterglow time.

7.5 Test the further five test pieces as described in [7.1](#) to [7.4](#).

NOTE It may be necessary to shade the area to observe the afterglow.

8 Expression of results

8.1 Record for each test pieces tested the duration of the persistence of flame and the afterglow time.

8.2 Calculate and record the mean duration of flame and the afterglow time and if any the presence of burning droplets.

8.3 Note any tendency for the material to burn freely or to drip after the withdrawal of the burner.

9 Requirements

Unless otherwise stated in the hose standard, the following requirements apply:

- the mean duration of the six test pieces, shall not exceed one minute (1 min) of flame;
- and three minutes (3 min) of afterglow.

10 Test report

The test report shall include the following information:

a) the statement:

“The test results relate only to the behaviour of the test pieces under the particular conditions of test; they shall not be used as a means of assessing the potential fire hazard of the hose in use.”

b) a statement that the test was carried out in accordance with ISO 8030:2014;

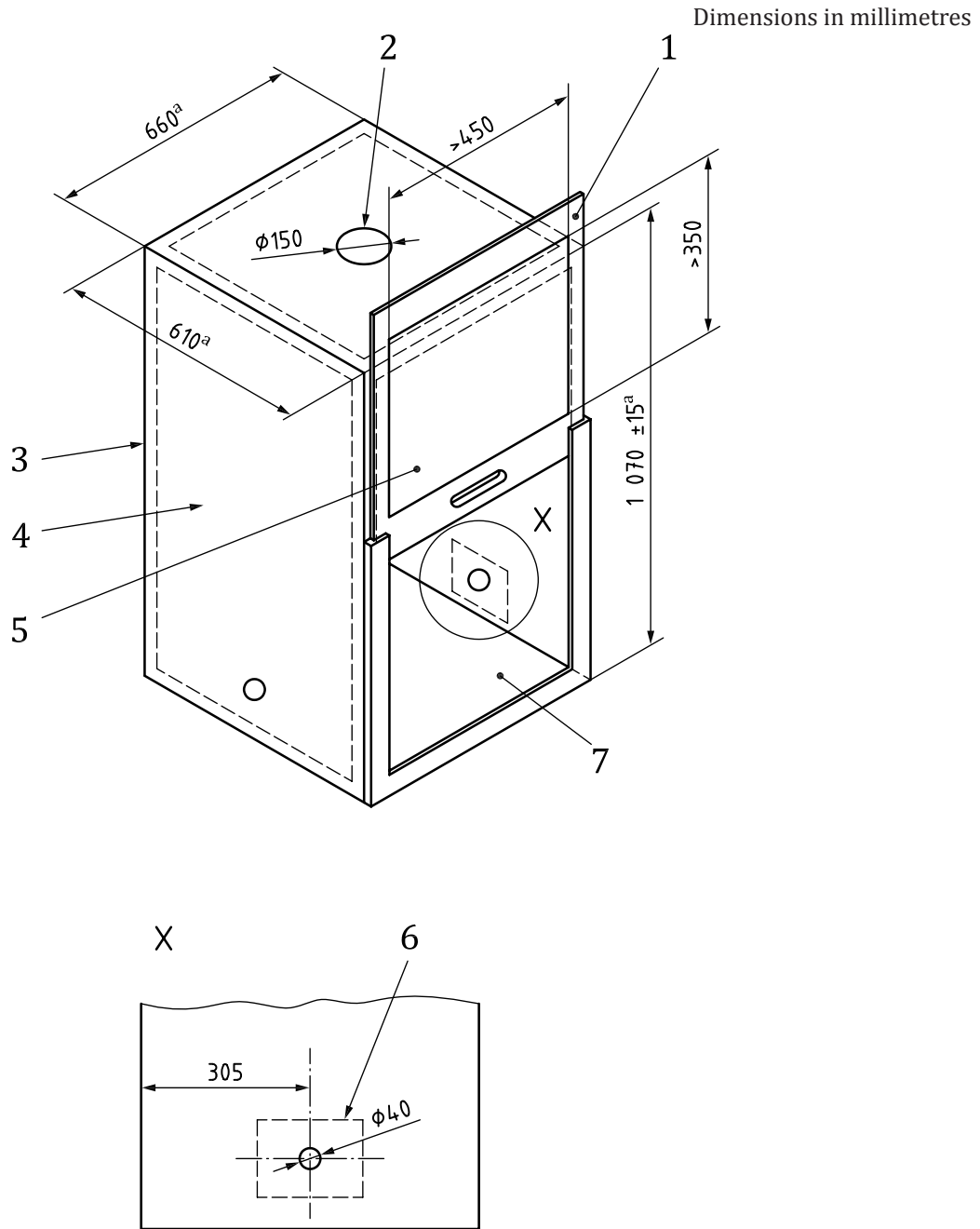
c) the nominal bore of the hose;

d) the hose type and standard, the date of manufacture and batch number or reference, if known;

e) the method of manufacture and details of reinforcement;

f) the date of test;

g) the results of the test as required in [Clause 8](#).

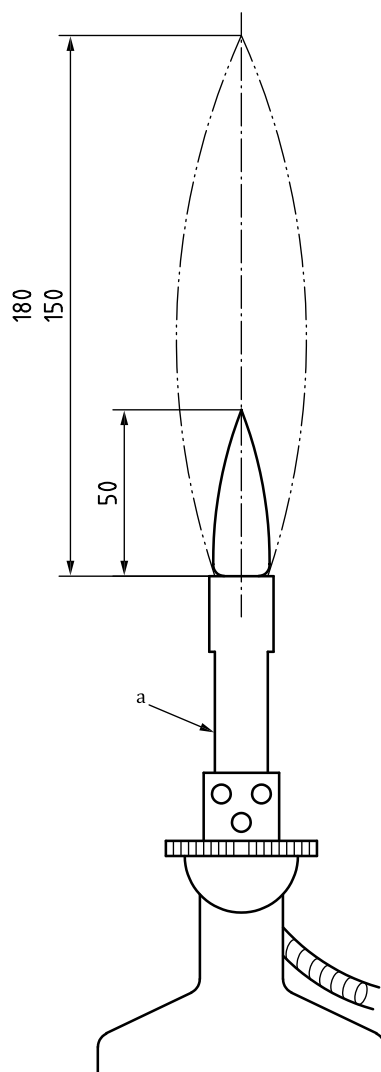


Key

- | | |
|---|--|
| <p>1 door shall be flush-fitting, shall completely cover the cabinet aperture and shall slide vertically</p> <p>2 ventilation hole</p> <p>3 30 mm \pm 5 mm angle-iron framework, if required</p> <p>4 top, sides and base made of asbestos-free insulating board</p> | <p>5 window aperture covered by an airtight transparent panel, e.g. 4,5 mm to 5 mm toughened soda glass</p> <p>6 130 mm \times 75 mm single opening (with flap) for access to burner, if desired</p> <p>7 600 mm \times 600 mm aperture</p> <p>^a Internal diameter.</p> |
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Figure 1 — Cabinet for flammability test

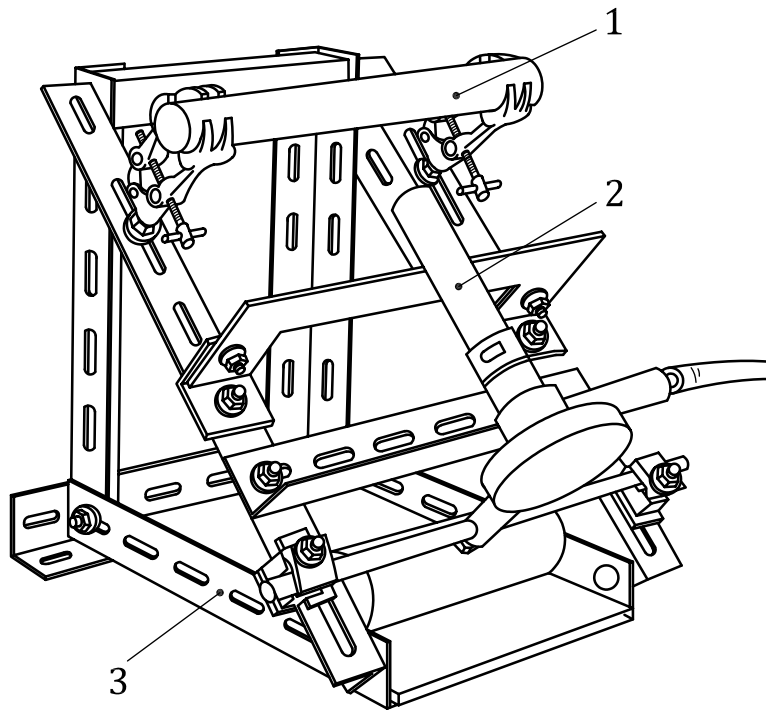
Dimensions in millimetres



Key

a Inside diameter \varnothing 10 mm \pm 0,5 mm.

Figure 2 — Gas burner



Key

- 1 hose test piece
- 2 gas burner
- 3 stand

Figure 3 — Example of arrangement for flammability test

Bibliography

- [1] ISO 13774:1998, *Rubber and plastics hoses for fuels for internal-combustion engines — Method of test for flammability*

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