
**Petroleum and related products —
Determination of wick flame
persistence of fire-resistant fluids**

*Pétrole et produits connexes — Détermination de la persistance
d'une flamme sur une mèche trempée dans un fluide difficilement
inflammable*

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Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	1
5 Reagents and materials	2
6 Apparatus	2
7 Samples and sampling	5
8 Preparation of apparatus	5
9 Procedure	5
10 Calculation	6
11 Expression of results	6
12 Precision	6
13 Test report	7
Bibliography	8

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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).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 28, *Petroleum and related products, fuels and lubricants from natural or synthetic sources*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 19, *Gaseous and liquid fuels, lubricants and related products of petroleum, synthetic and biological origin*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 14935:1998), which has been technically revised. The main changes compared to the previous edition are as follows:

- material data of the reservoir have been changed;
- some designations have been changed;
- drawings have been revised;
- tolerances in ignition and dropping times and nozzle dimensions have been tightened for better accuracy.

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.

Introduction

This document was originally developed by CEN under a mandate from the European Commission.

The test methodology laid down in this document is commonly listed in fire-resistant hydraulic fluids' specifications, such as ISO 12922, in which it defines the minimum requirements for unused flame-retardant and less flammable hydraulic fluids for hydrostatic and hydro-dynamic systems in general industrial applications.

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Petroleum and related products — Determination of wick flame persistence of fire-resistant fluids

WARNING — The use of this document can involve hazardous materials, operations and equipment. This document does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this document to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

1 Scope

This document specifies a method for the assessment of the persistence of a flame applied to the edge of a wick of non-flammable material immersed in fire-resistant fluid.

This test does not determine the behaviour of a spray of fire-resistant fluid.

NOTE Such test methods are specified in ISO 15029-1 and ISO 15029-2.

This document specifies one of four basic tests for determining flammability.

This document does not apply to certain liquids such as HFAE and HFAS liquids.

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 3170, *Petroleum liquids — Manual sampling*

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

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

flame mean persistence

persistence for each of the five different periods of application of the igniting flame calculated as the average of the six determinations

4 Principle

A length of non-flammable aluminosilicate plate is soaked in the fluid being tested and placed in a reservoir of the fluid with one edge exposed.

A small flame is applied to the exposed edge of the plate, and the persistence, in seconds, of the flame after removal of the igniting flame is measured. The tests are carried out with five different exposure times (2 s, 5 s, 10 s, 20 s and 30 s) and the after burning time is measured six times for each of the five

exposure times. As a result, the mean of the six recorded results shall be calculated from each of the five exposure times (see [Clause 10](#)). The highest mean value is the mean duration of the continued burning.

5 Reagents and materials

5.1 Propane, of commercial quality in accordance with ISO 9162.

5.2 Cleaning materials, for cleaning the reservoir, consisting of solvents appropriate to the material being tested.

6 Apparatus

6.1 Reservoir, made of brass, 200 mm in length, 25 mm in width and 20 mm in depth. It shall be fitted with clips or clamping devices to hold the plate ([6.5](#)) at either end, with a distance between the inner edges of these clips of $180 \text{ mm} \pm 2 \text{ mm}$. Each clip or clamp shall have a reference mark at $30 \text{ mm} \pm 0,5 \text{ mm}$ above the inside bottom of the reservoir. [Figure 1](#) illustrates a suitable reservoir.

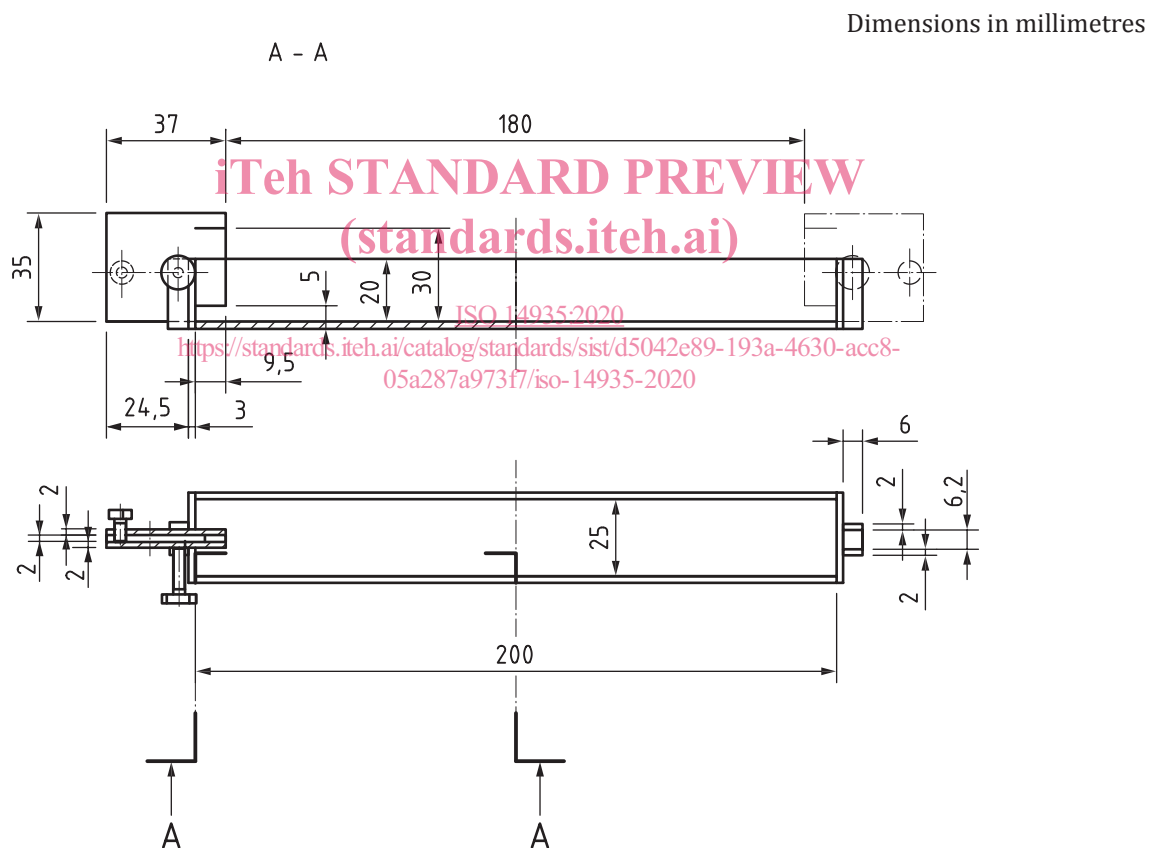


Figure 1 — Reservoir

6.2 Burner, fitted with a nozzle¹⁾ of 0,6 mm diameter as illustrated in [Figure 2](#).

The burner may be made from a tube with an internal diameter of 6,0 mm, one end of which has a thread to receive the nozzle (see [Figure 2](#)) and the other end has a thread to receive the connection to the propane supply tube (swivel connector).

1) The British Oxygen Company No. 1 welding nozzle is an example of a suitable product available commercially. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of this product.

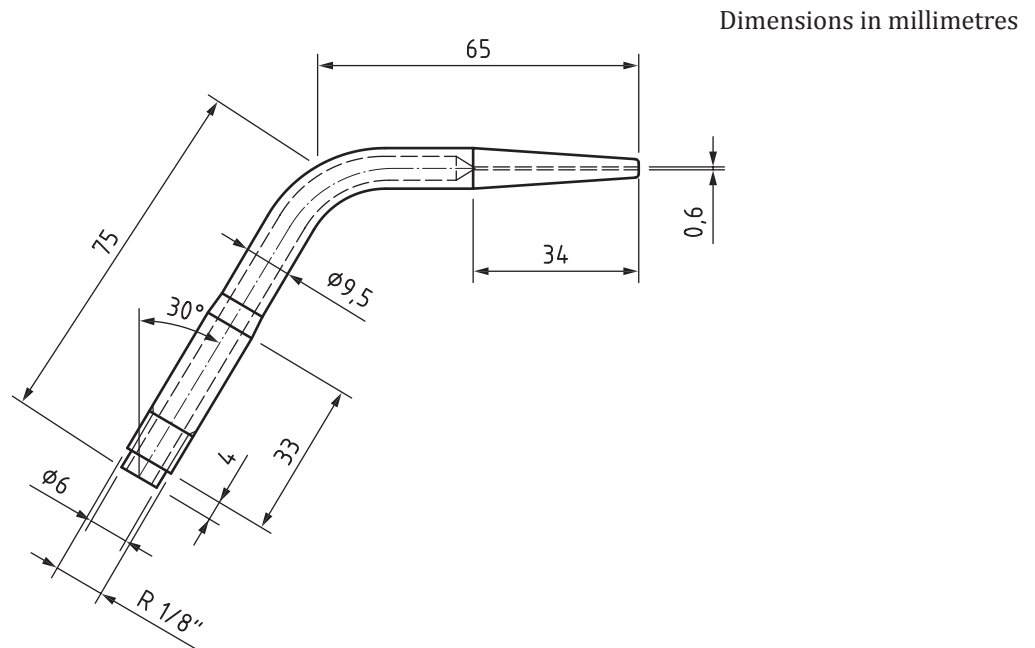


Figure 2 — Burner

6.3 Propane gas connection, by means of a flexible gas hose, the swivel connector on which the burner is installed is connected to the propane gas supply.

NOTE 1 The threaded connection to the swivel connector is shown in [Figure 3](#).

NOTE 2 When propane is supplied from cylinders, the regulating valve will normally consist separately of a pressure regulator and a needle valve to control the flow. Controlled-pressure reticulated supplies only require the needle valve.

6.4 Test rig, suitable for mounting the reservoir, test plate ([6.5](#)) and burner in the correct relative positions. A stop shall be provided such that the burner is positively located in the correct setting position for the height of the flame.

A means of moving the burner along the length of the plate shall be provided. The burner, by means of the swivel connector or pivot bar, shall be able to be moved such that the flame is displaced from the surface of the plate to a safe position.

NOTE Suitable test rig, see [Figure 3](#).