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**Determination of sustained  
combustibility of liquids**

*Essai de combustion entretenue de liquides*

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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](http://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](http://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](http://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 139, *Paints and varnishes*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 9038:2013), which has been technically revised.

The main changes compared to the previous edition are as follows:

- the test method has been aligned with the requirements of UN Test L.2<sup>[1][2]</sup>. In particular:
  - the requirement for triplicate tests instead of duplicate tests has been specified;
  - the standard test temperature has been changed to 60,5 °C;
  - the criteria for sustained combustion have been revised.

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](http://www.iso.org/members.html).

## Introduction

A product with a flash point within a given range can continue to burn after initial ignition, while a similar product, although it has a similar flash point, does not continue to burn. This document describes a method for discriminating between those products that sustain combustion and those that do not.

The method determines whether a flammable product, when maintained at a selected test temperature, generates sufficient flammable vapour to cause ignition when an ignition source is applied and then continues to generate sufficient vapour to burn when the ignition source is moved to the “off” position.

This test method does not determine the flash point of the product under test but, by means of a test procedure, merely determines if it sustains combustion at a selected test temperature; this criterion can be required to comply with laws or regulations relating to the storage, transport and use of flammable products. Before performing this test, for safety and test optimization reasons, it is usual to determine either the actual flash point of the material or know the temperature range in which the flash point is located.

The apparatus specified in this document enables a result to be determined by a rapid procedure using a small test portion (2 ml).



# Determination of sustained combustibility of liquids

**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 users of this document to take appropriate measures to ensure the safety and health of personnel prior to the application of this document, and to determine the applicability of any other restrictions for this purpose.

## 1 Scope

This document specifies a procedure, at temperatures up to 100 °C, to determine whether a liquid product, that would be classified as “flammable” by virtue of its flash point, sustains combustion at the temperature(s) specified e.g. in regulations.

**NOTE** Many national and international regulations classify liquids as presenting a flammable hazard based on their flash point, as determined by a recognized method. Some of these regulations allow a derogation if the substance cannot “sustain combustion” at some specified temperature(s).

The procedure is applicable to paints (including water-borne paints), varnishes, paint binders, solvents, petroleum or related products and adhesives, that have a flash point. It is not applicable to painted surfaces in respect of assessing their potential fire hazards.

This test method is applicable, in addition to test methods for flash point, for assessing the fire hazard of a product.

## 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 1513, *Paints and varnishes — Examination and preparation of test samples*

ISO 3170, *Petroleum liquids — Manual sampling*

ISO 3171, *Petroleum liquids — Automatic pipeline sampling*

ISO 15528, *Paints, varnishes and raw materials for paints and varnishes — Sampling*

## 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

#### **sustained combustibility**

behaviour of a material, under specified test conditions, whereby its vapour can be ignited by an ignition source and, after ignition, sufficient flammable vapour is produced for burning to continue for at least 15 s after the source of ignition has been removed