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**Determination of flash point — Abel  
closed-cup method**

*Détermination du point d'éclair — Méthode Abel en vase clos*



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# Contents

Page

<b>Foreword</b>	<b>iv</b>
<b>Introduction</b>	<b>v</b>
<b>1 Scope</b>	<b>1</b>
<b>2 Normative references</b>	<b>1</b>
<b>3 Terms and definitions</b>	<b>1</b>
<b>4 Principle</b>	<b>2</b>
<b>5 Chemicals and materials</b>	<b>2</b>
<b>6 Apparatus</b>	<b>2</b>
<b>7 Apparatus preparation</b>	<b>3</b>
7.1 Location of the apparatus	3
7.2 Cleaning the test cup	3
7.3 Apparatus examination	3
7.4 Heating and cooling	3
7.4.1 Liquid baths	3
7.4.2 Solid metal baths	3
7.4.3 Test cup and cover	3
7.5 Apparatus verification	4
<b>8 Sampling</b>	<b>4</b>
<b>9 Sampling handling</b>	<b>5</b>
9.1 General	5
9.2 Subsampling	5
9.3 Samples containing undissolved water	5
9.4 Sample mixing	5
<b>10 Procedure</b>	<b>5</b>
<b>11 Calculation</b>	<b>6</b>
<b>12 Expression of results</b>	<b>7</b>
<b>13 Precision</b>	<b>7</b>
13.1 General	7
13.2 Repeatability, $r$	7
13.3 Reproducibility, $R$	8
<b>14 Test report</b>	<b>8</b>
<b>Annex A (normative) Abel flash point apparatus</b>	<b>9</b>
<b>Annex B (normative) Positioning and fixing of test cup and heating vessel thermometers into thermometer collar</b>	<b>16</b>
<b>Annex C (normative) Temperature measuring device specifications</b>	<b>18</b>
<b>Annex D (normative) Apparatus verification</b>	<b>20</b>
<b>Annex E (informative) Flash point values of chemicals</b>	<b>23</b>
<b>Bibliography</b>	<b>24</b>

## 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 products and lubricants*, 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 fourth edition cancels and replaces the third edition (ISO 13736:2013), which has been technically revised.

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

- the [Subclause 7.5](#) has been further elaborated;
- under [13.2](#) and [13.3](#), the precision definitions have been updated in line with ISO 4259-1<sup>[3]</sup>;
- in [Annex C](#) the digital contact thermometers have been introduced and furthermore explanation on the generic liquid-in-glass thermometers has been introduced;
- [Annex D](#) has been revised (especially the evaluation subclause) and changed to normative status;
- a new [Annex E](#) on flash point values of chemicals has been introduced.

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

Flash point values are used in shipping, storage, handling and safety regulations, as a classification property to define “flammable” and “combustible” materials. Precise definition of the classes is given in each particular regulation.

A flash point value can indicate the presence of highly volatile material(s) in a relatively non-volatile or non-flammable material, and flash point testing can be a preliminary step to other investigations into the composition of unknown materials.

Flash point determinations are not appropriate for potentially unstable, decomposable, or explosive materials, unless previously established that heating the specified quantity of such materials in contact with the metallic components of the flash point apparatus, within the temperature range required for the method, does not induce decomposition, explosion or other adverse effects.

Flash point values are not a constant physical-chemical property of materials tested. They are a function of the apparatus design, the condition of the apparatus used, and the operational procedure carried out. Flash point can therefore be defined only in terms of a standard test method, and no general valid correlation can be guaranteed between results obtained by different test methods or with test apparatus different from that specified.

ISO/TR 29662<sup>[Z]</sup> gives useful advice on carrying out flash point tests and interpreting results.



# Determination of flash point — Abel closed-cup method

**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 the standard, and to determine the applicability of any other restrictions for this purpose.

## 1 Scope

This document specifies a method for the determination of the manual and automated closed cup flash point of combustible liquids having flash points between  $-30,0\text{ }^{\circ}\text{C}$  to  $75,0\text{ }^{\circ}\text{C}$ . However, the precision given for this method is only valid for flash points in the range  $-8,5\text{ }^{\circ}\text{C}$  to  $75,0\text{ }^{\circ}\text{C}$ .

This document is not applicable to water-borne paints.

NOTE 1 Water borne paints can be tested using ISO 3679<sup>[1]</sup>.

NOTE 2 See 9.1 for the importance of this test in avoiding loss of volatile materials.

NOTE 3 Liquids containing halogenated compounds can give anomalous results.

NOTE 4 The thermometer specified for the manual apparatus limits the upper test temperature to  $70,0\text{ }^{\circ}\text{C}$ .

NOTE 5 See 13.1 for more specific information related to precision.

## 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 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

#### flash point

lowest temperature of the test portion, adjusted to account for variations in atmospheric pressure from 101,3 kPa, at which application of an ignition source causes the vapour of the test portion to ignite and the flame to propagate across the surface of the liquid under the specified conditions of test