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

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



This document is a preview generated by EBS



COPYRIGHT PROTECTED DOCUMENT

© ISO 2013

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

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 Chemicals and materials.....	2
6 Apparatus.....	2
7 Apparatus preparation.....	3
7.1 Location of the apparatus.....	3
7.2 Cleaning the test cup.....	3
7.3 Apparatus examination.....	3
7.4 Heating/cooling.....	3
7.5 Apparatus verification.....	4
8 Sampling.....	4
9 Sample handling.....	4
9.1 General.....	4
9.2 Storage prior to testing.....	4
9.3 Sample preparation.....	4
10 Procedure.....	5
11 Calculation.....	6
12 Expression of results.....	6
13 Precision.....	6
13.1 General.....	6
13.2 Repeatability, r	7
13.3 Reproducibility, R	7
14 Test report.....	7
Annex A (normative) Abel flash point apparatus.....	8
Annex B (normative) Positioning and fixing of test cup and heating vessel thermometers into thermometer collar.....	16
Annex C (normative) Thermometer specifications.....	18
Annex D (informative) Apparatus verification.....	20
Bibliography.....	23

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. 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. 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.

The committee responsible for this document is ISO/TC 28, *Petroleum products and lubricants*.

This third edition cancels and replaces the second edition (ISO 13736:2008), which has been technically revised.

Introduction

Flash point values can be 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^[1] (CEN/TR 15138^[2]) gives useful advice on carrying out flash point tests and interpreting results.

Determination of flash point — Abel closed-cup method

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

1 Scope

This International Standard 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 International Standard is not applicable to water-borne paints.

NOTE 1 Water-borne paints can be tested using ISO 3679.[3]

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 $70,0\text{ }^{\circ}\text{C}$.

2 Normative references

The following referenced documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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.

3.1

flash point

lowest temperature of the test portion, corrected to a barometric pressure of $101,3\text{ kPa}$, 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

4 Principle

The test portion is placed in the test cup of an Abel apparatus and heated to give a constant temperature increase with continuous stirring. An ignition source is directed through an opening in the test cup cover at regular temperature intervals with simultaneous interruption of stirring. The lowest temperature at which application of the ignition source causes the vapours of the test portion to ignite and propagate over the surface of the liquid is recorded as the flash point at the ambient barometric pressure. The temperature is corrected to standard atmospheric pressure using an equation.