

Determination of flash point - Method for flash no-flash and flash point by small scale closed cup tester (ISO 3679:2022)

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 3679:2022 sisaldab Euroopa standardi EN ISO 3679:2022 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 3679:2022 consists of the English text of the European standard EN ISO 3679:2022.
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English Version

**Determination of flash point - Method for flash no-flash
and flash point by small scale closed cup tester (ISO
3679:2022)**

Détermination du point d'éclair - Détermination de
l'éclair de type passe / ne passe pas et méthode du
point d'éclair en vase clos à petite échelle (ISO
3679:2022)

Bestimmung des Flammpunkts - Verfahren zur
Bestimmung des Flammpunkts und des Nicht-
Flammpunkts mit einem kleinen geschlossenen
Tiegelprüfgerät (ISO 3679:2022)

This European Standard was approved by CEN on 30 September 2022.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

This document (EN ISO 3679:2022) has been prepared by Technical Committee ISO/TC 28 "Petroleum and related products, fuels and lubricants from natural or synthetic sources" in collaboration with Technical Committee CEN/TC 19 "Gaseous and liquid fuels, lubricants and related products of petroleum, synthetic and biological origin" the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2023, and conflicting national standards shall be withdrawn at the latest by May 2023.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 3679:2015.

Any feedback and questions on this document should be directed to the users' national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Endorsement notice

The text of ISO 3679:2022 has been approved by CEN as EN ISO 3679:2022 without any modification.

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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).

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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 fifth edition cancels and replaces the fourth edition (ISO 3679:2015), which has been technically revised.

The main changes are as follows:

- introduction, title and scope have been revised to present a more generic method description;
- terms and definitions in [Clause 3](#) have been added;
- verification clause has been revised;
- new procedure C has been added;
- [Clause 13](#) wording has been revised and precision for procedure C has been included;
- the apparatus description in [Annex A](#) has been revised;
- [Annex B](#) has been revised and changed to normative;
- the text has been editorially revised in line with the ISO/IEC Directives Part 2, 2021.

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 includes three procedures (A, B and C) covering determinations of flash no-flash and flash point. Rapid equilibrium procedures A and B enable the determination of the flash no-flash and flash point, respectively. Non-equilibrium procedure C uses automated test cup temperature control for flash point determination.

ISO 1516 and ISO 1523 are also closed cup equilibrium test methods that can be considered when selecting a method.

The apparatus specified in this document enables a similar test result to be determined using more rapid procedures, A or B, and a smaller test portion (2 ml or 4 ml), than those required in ISO 1516 or ISO 1523. In addition, the apparatus in this document can be made portable so that it is suitable for on-site testing, as well as its regular use in laboratories. Collaborative work^[16] has shown that results obtained by these methods are comparable. Procedure C is based on test methods IP 534^[18] and ASTM D7236^[14].

The interpretation of flash point results obtained on solvent mixtures containing halogenated hydrocarbons should be considered with caution, as these mixtures can give anomalous results^[17].

A limited study has indicated that some water borne paints can give an elevated flash point when an electric ignitor is used with this document.

Flash point is 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.

The flash point indicates the presence of highly volatile material(s) in a relatively non-volatile or non-flammable material. Flash point testing is often used as a preliminary step to other investigations into the composition of unknown materials.

It is not appropriate for flash point determinations to be carried out on potentially unstable, decomposable, or explosive materials. That is, unless it has been 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.

The flash point is not a constant physical-chemical property of a material tested. It is a function of the apparatus design, the condition of the apparatus used, and the operational procedure carried out. Flash point can therefore only be defined 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 also gives useful advice in carrying out flash point tests and interpreting results.

Determination of flash point – Method for flash no-flash and flash point by small scale closed cup tester

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 describes three procedures (A, B and C) covering determinations of flash no-flash and flash point.

Rapid equilibrium procedures A and B are applicable to flash no-flash and flash point tests of paints, including water-borne paints, varnishes, binders for paints and varnishes, adhesives, solvents, petroleum products including aviation turbine, diesel and kerosene fuels, fatty acid methyl esters and related products over the temperature range $-30\text{ }^{\circ}\text{C}$ to $300\text{ }^{\circ}\text{C}$. The rapid equilibrium procedures are used to determine whether a product will or will not flash at a specified temperature (flash no-flash procedure A) or the flash point of a sample (procedure B). When used in conjunction with the flash detector (A.1.6), this document is also suitable to determine the flash point of fatty acid methyl esters (FAME). The validity of the precision is given in Table 2.

Non-equilibrium procedure C is applicable to petroleum products including aviation turbine, diesel and kerosene fuels, and related petroleum products, over the temperature range $-20\text{ }^{\circ}\text{C}$ to $300\text{ }^{\circ}\text{C}$. The non-equilibrium procedure is automated to determine the flash point. Precision has been determined over the range $40\text{ }^{\circ}\text{C}$ to $135\text{ }^{\circ}\text{C}$.

For specifications and regulations, procedures A or B are routinely used (see 10.1.1).

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 Guide 35, *Reference materials — Guidance for characterization and assessment of homogeneity and stability*

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*

ISO 17034, *General requirements for the competence of reference material producers*

3 Terms and definitions

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