



BSI Standards Publication

Determination of flash point — Pensky-Martens closed cup method

National foreword

This British Standard is the UK implementation of EN ISO 2719:2025. It is identical to ISO 2719:2025. It supersedes BS EN ISO 2719:2016+A1:2021, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PTI/2, Liquid Fuels.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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Published by BSI Standards Limited 2025

ISBN 978 0 539 32351 1

ICS 75.080

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 December 2025.

Amendments/corrigenda issued since publication

Date	Text affected
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English Version

Determination of flash point - Pensky-Martens closed cup method (ISO 2719:2025)

Détermination du point d'éclair - Méthode Pensky-
Martens en vase clos (ISO 1719:2025)

Bestimmung des Flammpunktes - Verfahren nach
Pensky-Martens mit geschlossenem Tiegel (ISO
2719:2025)

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European foreword

This document (EN ISO 2719:2025) 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of an identical text or by endorsement, at the latest by June 2026, and conflicting national standards shall be withdrawn at the latest by June 2026.

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 2719:2016.

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Endorsement notice

The text of ISO 2719:2025 has been approved by CEN as EN ISO 2719:2025 without any modification.

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Principle	2
5 Chemicals and materials	2
6 Apparatus	2
7 Apparatus preparation	3
7.1 General	3
7.2 Location of the apparatus	3
7.3 Cleaning the test cup	3
7.4 Apparatus assembly	3
7.5 Apparatus verification	3
8 Sampling	4
9 Sample handling	5
9.1 Petroleum products	5
9.1.1 Sub-sampling	5
9.1.2 Samples containing undissolved water	5
9.1.3 Samples that are liquid at ambient temperature	5
9.1.4 Samples that are very viscous, semi-solid or solid at ambient temperature	5
9.2 Paints and varnishes	5
10 Procedure	6
10.1 General	6
10.2 Procedure A	6
10.3 Procedure B	7
10.4 Procedure C	8
11 Calculation	9
11.1 Conversion of barometric pressure reading	9
11.2 Correction of detected flash point	9
12 Expression of results	9
13 Precision	9
13.1 General	9
13.2 Repeatability, r	9
13.3 Reproducibility, R	10
14 Test report	11
Annex A (normative) Apparatus verification using reference materials	12
Annex B (normative) Pensky-Martens closed cup test apparatus	15
Annex C (normative) Temperature measuring device specification	23
Annex D (normative) Requirements for hot wire ignitors and flash point detectors	25
Bibliography	27

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 document 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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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 Technical Committee ISO/TC 35 *Paints and varnishes* and 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 2719:2016), which has been technically revised. It also incorporates the Amendment ISO 2719:2016/Amd 1:2021.

The main changes are as follows:

- revisions to [3.1](#), [5.2](#), [6.1](#), [7.1](#), [7.2](#), [7.5](#), [10.1.1](#), [11.2](#), [14](#), [C.2](#) and [Table A.1](#);
- revision of [Annex A](#) and status changed to normative;
- new normative [Annex D](#).

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

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

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

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^[6] gives useful advice in carrying out flash point tests and interpreting their results.

Determination of flash point — Pensky-Martens closed cup method

WARNING — The use of this document can involve hazardous materials, operations and equipment. This document does not purport to address all 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 three procedures, A, B and C, using the Pensky-Martens closed cup tester, for determining the flash point of combustible liquids, liquids with suspended solids, liquids that tend to form a surface film under the test conditions, biodiesel and other liquids in the temperature range of 40 °C to 370 °C.

NOTE 1 Although, technically, kerosene with a flash point above 40 °C can be tested using this document, it is standard practice to test kerosene according to ISO 13736.^[5] Similarly, lubricating oils are normally tested according to ISO 2592.^[2]

Procedure A is applicable to distillate fuels (diesel, biodiesel blends, heating oil and turbine fuels), new and in-use lubricating oils, paints and varnishes, and other homogeneous liquids not included in the scope of procedures B or C.

Procedure B is applicable to residual fuel oils, cutback residuals, used lubricating oils, mixtures of liquids with solids, and liquids that tend to form a surface film under test conditions or are of such kinematic viscosity that they are not uniformly heated under the stirring and heating conditions of procedure A.

Procedure C is applicable to fatty acid methyl esters (FAME) as specified in specifications such as EN 14214^[11] or ASTM D6751.^[13]

This document is not applicable to water-borne paints and varnishes.

NOTE 2 Water-borne paints and varnishes can be tested using ISO 3679.^[3] Liquids containing traces of highly volatile materials can be tested using ISO 1523^[1] or ISO 3679.

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, *Hydrocarbon 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 terminology databases for use in standardization at the following addresses:

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

4 Principle

The test portion is placed into the test cup of a Pensky-Martens apparatus and heated to give a constant temperature increase with continuous stirring. An ignition source is directed through an opening in the test cup lid at regular temperature intervals with simultaneous interruption of stirring. The lowest temperature at which the application of the ignition source causes the vapour of the test portion to ignite and a flame to propagate over the surface of the liquid is recorded as the flash point at the absolute barometric pressure. This temperature is corrected to standard atmospheric pressure using a specified formula.

5 Chemicals and materials

5.1 Cleaning solvent, for removal of traces of sample from the test cup and cover.

The choice of solvent depends upon the previous material tested and the tenacity of the residue. Low volatility aromatic (benzene free) solvents may be used to remove traces of oil, and mixed solvents such as toluene-acetone-methanol can be efficacious for the removal of gum-type deposits.

5.2 Reference materials (RM), for flash point, certified reference materials (CRM) or secondary working standards (SWS), as described in [Annex A](#).

NOTE Reference materials are available from apparatus manufacturers and other commercial sources, or as retained samples from proficiency testing schemes.

6 Apparatus

6.1 Flash point apparatus, as described in [Annex B](#).

It is permitted for automated apparatus to divert from the standard configuration, for example, to enable the use of electronic thermometers, flash detectors and safety measures.

If automated equipment is used, ensure that the test cup and cover assembly conform to the key dimensions specified in [Annex B](#) and the procedures described in [Clause 10](#) are followed. The user shall ensure that all the manufacturer's instructions for adjusting and operating the instrument are followed. Implementation and positioning of mechanical fixtures and components, required for automation, such as flash detectors and ignitors, can vary with different manufacturers.

NOTE Under certain circumstances, the use of electric ignition sources can give different results to those obtained when using a flame ignition source.

In cases of dispute, unless explicitly agreed otherwise, the flash point as determined using a flame ignition source shall be considered the referee test.

6.2 Temperature measuring devices, meeting the requirements for accuracy and the response time as specified in [Annex C](#).

6.3 Barometer, absolute pressure reading, accuracy of $\pm 0,5$ kPa, and with a resolution of 0,1 kPa.

Barometers pre-corrected to give sea level readings, such as those used at weather stations and airports, shall not be used.

NOTE Some automated apparatus include an integral barometer that automatically measures and records the absolute barometric pressure and makes the required corrections to the detected flash point.

6.4 Heating bath or oven, capable of controlling the temperature to ± 5 °C, for warming the sample if required.

The oven shall be ventilated and constructed in such a way that it will not cause ignition of any flammable vapours that can be produced when the sample is heated.

The oven should be an explosion-protected type.

7 Apparatus preparation

7.1 General

Follow the manufacturer's instructions for the correct setup, calibration, verification ([7.5](#)) and operation of the apparatus including the integral barometer (if fitted), flash detector (if fitted) and temperature measuring device, and ensure that the apparatus is as specified in [Annex C](#) and [Annex D](#).

7.2 Location of the apparatus

Support the flash point apparatus (see [6.1](#) and [Annex B](#)) on a level and steady surface in a draught-free position.

NOTE When draughts cannot be avoided, it is good practice to surround the apparatus with a shield.

WARNING — When testing materials that can produce toxic vapours, the apparatus should be in a fume hood with individual air flow control, adjusted so that vapours can be withdrawn without causing air currents around the test cup during the test.

7.3 Cleaning the test cup

Wash the test cup, its cover and its accessories with an appropriate cleaning solvent ([5.1](#)) to remove any traces of gum or residue remaining from a previous test. Dry using a stream of clean air to ensure complete removal of the solvent used.

7.4 Apparatus assembly

Examine the test cup, the cover and other parts to ensure that they are free from signs of damage and deposits. Assemble the apparatus in accordance with [Annex B](#).

7.5 Apparatus verification

7.5.1 Check the temperature measuring devices and barometer at least once a year to ensure that they are in accordance with [Annex C](#) and [6.3](#), respectively. Follow the manufacturer's instructions to make any necessary corrections.

7.5.2 Ensure that the correct operation of ignition sources and flash detectors is in accordance with the manufacturer's instructions and this test method as specified in [Annex B](#) and [Annex D](#).

7.5.3 Verify the accuracy of the apparatus at least once a year by testing a CRM (see [5.2](#) and [Annex A](#)). It is recommended that more frequent verification checks are made using an RM (see [5.2](#) and [Annex A](#)).