BS 2000 :
Part 35 : 1993

Methods of test for

Petroleum and its products

Part 35. Determination of open flash and fire point – Pensky-Martens method

(Identical with IP 35/63(86))

Confirmed
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BSi
British Standards

Foreword

This British Standard, having been prepared under the direction of the Petroleum Standards Policy Committee, was published under the authority of the Standards Board and comes into effect on 28 February 1993.

This British Standard supersedes BS 2000 : Part 35 : 1982, which is withdrawn.

BS 2000 comprises a series of test methods for petroleum and its products that are published by the Institute of Petroleum (IP) and have been accorded the status of a British Standard. Each method should be read in conjunction with the preliminary pages of `IP Standard methods for analysis and testing of petroleum and related products' which gives details of the BSI/IP agreement for publication of the series, provides general information on safety precautions, sampling and other matters, and lists the methods published as Parts of BS 2000.

The numbering of the Parts of BS 2000 follows that of the corresponding methods published in `IP Standard methods for analysis and testing of petroleum and related products'. Under the terms of the agreement between BSI and the Institute of Petroleum, the revised version of BS 2000 : Part 35 will be published by the IP (in `Standard methods for analysis and testing of petroleum and related products' and as a separate publication). BS 2000 : Part 35 : 1993 is thus identical with IP 35/63, which was reapproved in 1986. Square brackets marked in the margin of this IP Standard indicate text that differs from the previous edition.

IP 35 was previously published as a British Standard as BS 4688 (now withdrawn) which was subsequently renumbered and issued in the BS 2000 series.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Committee reference PTC/13

IP 35/63 (1986) BS 2000: Part 35: 1993

Determination of open flash and fire point – Pensky–Martens method

This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations.

SCOPE

1 This method is intended for the determination of the open flash point and the fire point of petroleum products.

APPARATUS

2. The standard Pensky–Martens Tester, as prescribed in method ASTM D93-IP 34, with the following modifications:

The cover of the cup shall be replaced by a clip which encircles the upper rim of the cup and carries the thermometer and test-flame. The tube carrying the thermometer shall have its centre on a radius at approximately 90° to the radius passing through the point of attachment of the test-flame, and shall be of such a height that when the thermometer is in position its bulb shall be in the vertical axis of the cup and 13 mm below the filling-line. The test-flame shall be fixed at the vertical axis of the cup and at a level with the upper edge of the cup.

TEST ROOM

3. The test shall be made in a room or compartment free from draughts, and darkened sufficiently for the flash to be readily discernible.

PROCEDURE

4. (*a*) Thoroughly clean and dry all parts of the cup and its accessories. Remove all traces of solvent used to clean the apparatus.

(*b*) Fill the cup with the sample up to the level indicated by the filling-mark.

(*c*) Place the clip carrying the thermometer and test-flame on the cup,[1] and set the latter in the stove. Ensure that the locating devices are properly engaged. Insert the thermometer. If it is known that the oil will flash above 104°C, use the IP 16C or ASTM 10C thermometer; otherwise, it is preferable to start with the IP 15C or ASTM 9C thermometer and change if a temperature of 104–110°C is reached.

(*d*) Light the test-flame and adjust it so that it is of the size of a bead 4 mm in diameter.

(*e*) Apply heat at such a rate that the temperature recorded by the thermometer increases not less than 5°C nor more than 6°C /min, and observe the surface of the oil carefully.

(*f*) *Open Flash Point* – Take the open flash point as the temperature when a flash first appears at any point on the surface of the oil.

(*g*) *Fire Point* – Continue the heating until the oil ignites and continues to burn for 5 sec. Record the temperature of the oil when this occurs as the fire point.

(*h*) No correction shall be applied for the exposed mercury thread.

REPORTING

5. Report the result as the Open Flash Point and/or Fire Point, IP 35, as appropriate.

PRECISION

6. The following criteria should be used for judging the acceptability of results (95% confidence):

(*a*) *Repeatability* – Duplicate results by the same operator should be considered suspect if they differ by more than the following amount:

Flash point (open) and fire point	8°C

(*b*) *Reproducibility* – The results submitted by each of two laboratories should not be considered suspect unless the two results differ by more than the following amounts:

Flash point	11°C
Fire point	14°C

NOTE: These precision values have been obtained by statistical examination of inter-laboratory test results,* and were first published in 1963. The original data were determined in °F. The °C figures have been obtained by direct mathematical conversion.

[1] If desired, the closed flash point may be determined, the heating discontinued while the lid is replaced by the clip, and the open flash point and fire point determined in succession with the same sample.

*See Appendix E.