

Method for

Determination of distillation characteristics of organic liquids (other than petroleum products)

Committees responsible for this British Standard

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- Chemical Industries Association
- Ministry of Defence
- Coopted members

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National foreword

This British Standard has been prepared under the direction of the Chemicals Standards Policy Committee. It is identical with ISO 918:1983 “*Volatile organic liquids for industrial use — Determination of distillation characteristics*”, prepared by Technical Committee TC 47, Chemistry, of the International Organization for Standardization (ISO).

This revision supersedes BS 4591:1971 which is withdrawn.

The principal difference between this standard and the 1971 edition is that reference to “asbestos board” and “asbestos shelf” have been replaced by “heat-resistant board” and “heat-resistant shelf” throughout, as the use of asbestos is now deprecated, for health reasons.

Cross-reference

International Standard	Corresponding British Standard
ISO 31-3:1978	BS 5775 <i>Specification for quantities, units and symbols</i> Part 3:1979 <i>Mechanics</i> (Identical)

The references to ISO 3405 and ISO 4626 in clauses 2 and 3 constitute informative matter only and, since no requirement is involved, the validity of this British Standard is not affected. A British Standard related to ISO 3405:1975 is BS 2000 “*Methods of test for petroleum and its products*”, Part 123:1985 “*Distillation of petroleum products*”.

With reference to the footnote on page 2, no International Standard for the sampling of liquid chemical products is yet available. However, attention is drawn to BS 5309 “*Methods of sampling chemical products*”, Part 3:1976 “*Sampling of liquids*”.

Additional information. Attention is drawn to the related British Standard BS 2000 “*Methods of test for petroleum and its products*” : Part 195:1983 “*Distillation range of volatile organic liquids*”.

This standard describes a method of test only and should not be used or quoted as a specification defining limits of purity. Reference to this standard should indicate that the method of test used is in accordance with BS 4591:1990.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 10, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope and field of application

This International Standard specifies an apparatus and method for the determination of distillation characteristics of volatile organic liquids which (excluding petroleum products) having a boiling point in the range 30 to 300 °C approximately and are stable during distillation in atmospheric conditions.

2 References

ISO 3405, *Petroleum products — Determination of distillation characteristics*.

ISO 4626, *Volatile organic liquids — Determination of boiling range of organic solvents used as raw materials*.

3 Definitions (see ISO 3405 and ISO 4626)

3.1

initial boiling point

the temperature noted (corrected, if required) at the moment when the first drop of condensate falls from the tip of the condenser during a distillation carried out under standardized conditions

3.2

final boiling point

the maximum temperature noted (corrected, if required) during the final phase of the distillation of a sample carried out under standardized conditions

3.3

dry point

the temperature noted (and corrected, if required) at the moment of vaporization of the last drop of liquid at the bottom of a flask, during a distillation carried out under standardized conditions

3.4

boiling range

the temperature interval between the initial boiling point and the dry point

4 Principle

Distillation of a test portion, under carefully defined conditions in order to determine either

4.1 the temperatures corresponding to the condensate volumes defined in the International Standard for the product under test; these temperatures shall be corrected as indicated in clause 9, unless the nature of the product provides only for a difference of temperature between two volumes of condensate, (plotting temperature as a function of volume); or

4.2 the volume of condensate when the thermometer indicates each of the distillation temperatures (previously adjusted as indicated in clause 9) specified in the International Standard for the product under test (plotting volume as a function of temperature).

5 Apparatus

Ordinary laboratory apparatus, and

5.1 *Distillation apparatus*, as shown in Figure 1 comprising

5.1.1 *Distillation flask*, available capacity 100 ml, of borosilicate glass, as shown in Figure 2.

5.1.2 *Thermometer*, of the mercury-in-glass type, graduated in 0,2 °C intervals, having a maximum error of $\pm 0,2$ °C and covering a range suitable for the products being tested.

The distance between the top of the bulb and the first graduation mark is at least 100 mm. The thermometer has no contraction chamber unless this is very close to the bulb or contained therein.

The scale is calibrated for use at 100 mm immersion (or alternatively for total immersion).

Additional requirements, in particular concerning the range of the thermometer, may be given in the International Standards for the products under test.

5.1.3 *Receiver*, 100 ml capacity, graduated as shown in Figure 3.

5.1.4 *Condenser* of the Liebig/West type, of borosilicate glass, as shown in Figure 4. The inner tube shall have the following dimensions:

Internal diameter	14,0 $\pm$ 1,0 mm
Wall thickness	1,0 to 1,5 mm
Length of straight portion of longer limb	600 $\pm$ 10 mm
Length of shorter limb	55 $\pm$ 5 mm
Angle included between longer and shorter limb	97 $\pm$ 3°

The inlet of the inner tube of the condenser shall be finished square with its axis and its outlet, smoothly ground at an angle of approximately 45° to the axis of the tube at that point, as shown in Figure 4.

The length of the central straight portion of the water jacket shall be 450 $\pm$ 10 mm, and its external diameter 35 $\pm$ 3 mm.

5.1.5 *Draught screen*, rectangular in cross-section and open at the top and bottom. It shall have the dimensions shown in Figure 5 and shall be made of sheet metal 0,7 mm thick.