INTERNATIONAL

RECOMMENDATION

OIML R 4

Edition 1972 (E)

Volumetric flasks (one mark) in glass

Fioles jaugées (à un trait) en verre

OIML R 4 Edition 1972 (E)

ORGANISATION INTERNATIONALE
DE MÉTROLOGIE LÉGALE

INTERNATIONAL ORGANIZATION
OF LEGAL METROLOGY

Foreword

The International Organization of Legal Metrology (OIML) is a worldwide, intergovernmental organization whose primary aim is to harmonize the regulations and metrological controls applied by the national metrological services, or related organizations, of its Member States.

The two main categories of OIML publications are:

- **International Recommendations (OIML R)**, which are model regulations that establish the metrological characteristics required of certain measuring instruments and which specify methods and equipment for checking their conformity ; the OIML Member States shall implement these Recommendations to the greatest possible extent;

- **International Documents (OIML D)**, which are informative in nature and intended to improve the work of the metrological services.

OIML Draft Recommendations and Documents are developed by technical committees or subcom-mittees which are formed by the Member States. Certain international and regional institutions also participate on a consultation basis.

Cooperative agreements are established between OIML and certain institutions, such as ISO and IEC, with the objective of avoiding contradictory requirements; consequently, manufacturers and users of measuring instruments, test laboratories, etc. may apply simultaneously OIML publications and those of other institutions.

International Recommendations and Inter-national Documents are published in French (F) and English (E) and are subject to periodic revision.

This publication – reference OIML R 4, edition 1972 (E) – was developed by the Pilot Secretariat SP 5S*. It was submitted to the Third International Conference of Legal Metrology in October 1968 for formal sanction.

OIML publications may be obtained from the Organization's headquarters :

Bureau International de Métrologie Légale
11, rue Turgot - 75009 Paris - France
Telephone: 33 (0)1 48 78 12 82 and 42 85 27 11
Fax: 33 (0)1 42 82 17 27
E-mail: biml@oiml.org
Internet: www.oiml.org

* *Note*: This publication is now under the responsibility of TC 8 "*Measurement of quantities of fluids*"

VOLUMETRIC FLASKS (one mark) in glass

1 SCOPE

The present Recommendation applies to glass "volumetric flasks", where the nominal capacity is marked by a single gauge mark on the neck.

It lays down the conditions with which these measures must comply in order to satisfy the requirements of the Legal Metrology Services.

2 DEFINITION OF CAPACITY

The capacity of a volumetric flask with a single gauge mark is the volume of water which the flask contains, at the reference temperature of 20 °C[*], when filled to the gauge mark.

The expression "filled to the gauge mark" means that the meniscus formed by the water in the neck has been adjusted in such a way that the plane passing through the upper edge of the gauge mark is tangential to the lowest point of the meniscus when the flask is placed on a horizontal plane surface.

3 SERIES OF NOMINAL CAPACITIES

The flasks must have one of the following nominal capacities ;

5, 10, 25, 50, 100, 200, 250, 500, 1000, 2000 cubic centimetres (the term "millilitre" may be used as a special name for the cubic centimetre).

However, flasks with nominal capacities other than those shown above are permitted for special requirements ; in this case, their other characteristics must fall within the framework of the provisions of the present Recommendation.

4 MATERIALS

The flasks must be made of transparent glass, as free as possible from visible defects and internal strain.

---

[*] Note: When, in certain tropical countries, it is necessary to use the flasks at temperatures considerably higher than 20 °C and when those countries do not wish to adopt the reference temperature of 20 °C, they are recommended to adopt a reference temperature of 27 °C.

5 CONSTRUCTION

5.1 The flasks must be of sufficiently robust construction to withstand normal usage and the wall must not show any substantial variations in thickness.

5. 2 The body must have a wide base to allow the flask to adopt a vertical, stable position (without pivoting or rocking) when resting on a flat, horizontal surface.

5. 3 The neck must be cylindrical without undue variation in the internal diameter or wall thickness throughout its length; at the level of the gauge mark it must have an internal diameter falling within the permissible limiting values specified in the Table following for the nominal capacity of the flask concerned; the upper part may include a widening or provision for a stopper.

There must be no apparent optical distortion caused by a defect near the gauge mark.

6 GAUGE MARK

6.1 The gauge mark must completely encircle the neck and lie in a plane parallel to the plane of the flask base; it must be continuous, of uniform thickness not greater than 0.4 mm, clearly visible, permanent and indelible under normal conditions of use of the flask.

6. 2 It must be placed within the lower two-thirds of the length of the neck and the distance between this mark and any point at which the neck begins to widen out must not be less than that specified in the Table following for the nominal capacity of the flask concerned.

7 CLASSES OF ACCURACY

According to the accuracy of the adjustment to their nominal value, the flasks are divided into two classes of accuracy, indicated respectively by the letters ‘A’ and ‘B’.

8 ERRORS IN NOMINAL CAPACITY

8.1 The maximum permissible errors in the nominal capacity of onemark volumetric flasks are those specified in the Table following for each of the nominal capacities and each of the two classes of accuracy.

9 INSCRIPTIONS

9.1 The following inscriptions must appear on the body of all flasks:

(a) the value in figures of the nominal capacity, followed by the symbol 'cm^3' or 'ml'; on flasks with a nominal capacity of 1000 cm^3 or 1000 ml and above, this capacity may be indicated in cubic decimetres (dm^3) or in litres (l);

(b) the letters 'In' to indicate that the nominal capacity is the volume contained;

(c) the abbreviation '20 °C' to indicate the reference temperature; if the reference temperature is 27 °C, this figure shall be substituted for 20 °C;

(d) the letter 'A' or 'B' to indicate the class of accuracy;

(e) the name or mark of the manufacturer or seller.

9. 1. 1 In addition, class 'A' flasks must be marked by an identification number ; this marking is optional for class 'B' flasks.

9. 2 All inscriptions must be clearly legible and indelible under normal conditions of use of the flasks.

10 METROLOGICAL CONTROLS

10.1 When, in any country, one-mark volumetric flasks are subjected to state metrological controls, these controls must include, according to the internal legislation of that country, all or some of the following:

- approval of the model,
- initial verification.

10.1.1 The procedure for these controls will be laid down in the national regulations of each country.

11 METROLOGICAL CONTROL MARK

11.1 The initial verification mark must be applied on the neck near the gauge mark, but in such a position that there is no risk of it interfering with the reading of the meniscus formed by the liquid being measured.

MAXIMUM PERMISSIBLE ERRORS

and

MANDATORY DIMENSIONS

Nominal capacity	Maximum permissible errors in nominal capacity		Internal diameter of neck at level of gauge mark	Minimum distance between gauge mark and any point at which neck begins to widen out
	Class A	Class B	Classes A and B	Classes A and B
cm^3	$\pm cm^3$	$\pm cm^3$	mm	mm
5	0.025	0.05	6 – 8	5
10	0.025	0.05	6 – 8	5
25	0.04	0.08	8 – 10	5
50	0.06	0.12	10 – 12	10
100	0.10	0.20	12 – 14	10
200	0.15	0.30	14 – 17	10
250	0.015	0.30	14 – 17	10
500	0.25	0.50	17 – 21	15
1000	0.40	0.80	21 – 25	15
2000	0.60	1.20	25 – 30	15

Contents

Foreword…….2

1 Scope……...……...3

2 Definition of capacity……..……..3

3 Series of nominal capacity……..……..3

4 Materials…….……..…….3

5 Construction……..……4

6 Gauge mark……..…….4

7 Classes of accuracy……..…….4

8 Errors in nominal capacity……..……..4

9 Inscriptions……..……..5

10 Metrological controls……5

11 Metrological control mark……5

Annex Maximum permissible errors and mandatory dimensions……..6