International Standard ISO 4788

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Laboratory glassware — Graduated measuring cylinders

Verrerie de laboratoire — Éprouvettes graduées cylindriques

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 4788 was developed by Technical Committee ISO/TC 48, *Laboratory glassware and related apparatus*, and was circulated to the member bodies in October 1978.

It has been approved by the member bodies of the following countries :

Australia	India	Romania
Austria	Israel	South Africa, Rep. of
Bulgaria	Italy	Spain
Canada	Korea, Rep. of	United Kingdom
Czechoslovakia	Mexico	USSR
France	Netherlands	
Germany, F. R.	Poland	

No member body expressed disapproval of the document.

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Laboratory glassware — Graduated measuring cylinders

1 Scope and field of application

This International Standard specifies requirements for an internationally acceptable series of cylinders, with a graduated scale and either a pouring spout or a stopper, adequate for general laboratory purposes.

The details specified are in conformity with ISO 384.

2 References

ISO 383, *Laboratory glassware — Interchangeable conical ground joints.*

ISO 384, *Laboratory glassware — Principles of design and construction of volumetric glassware.*

ISO 4794, *Laboratory glassware — Pipettes — Methods for assessing the chemical resistance of enamels used for colour coding.*

3 Basis of adjustment

3.1 Unit of volume

The unit of volume shall be the cubic centimetre (cm^3), for which the name millilitre (ml) may be used.

NOTE — The term millilitre (ml) is commonly used as a special name for cubic centimetre (cm^3), in accordance with the International System of Units (SI).

3.2 Reference temperature

The standard reference temperature, i.e. the temperature at which the cylinder is intended to contain its nominal volume (nominal capacity), shall be 20 °C.

NOTE — If the cylinder is required for use in a country which has adopted a standard reference temperature of 27 °C (the alternative recommended in ISO 384 for tropical use), this value shall be substituted for 20 °C.

4 Class of accuracy

One class of accuracy only is specified, the accuracy being lower than that associated with items of volumetric glassware intended for analytical use.

5 Types

Cylinders shall be provided either with a pouring spout (see figure 1), or with a ground neck (see figure 2) and a suitably fitting stopper.

6 Series of capacities

The series of capacities of graduated measuring cylinders shall be as shown in table 1.

NOTE — If capacities of cylinders other than those listed in table 1 are required, it is recommended that they conform to the essential requirements of this International Standard.

Table 1 — Series of capacities, divisions and tolerances

Nominal capacity	Smallest scale division	Maximum permitted error	Maximum capacity corresponding to lowest graduation line
ml	ml	ml	ml
5	0,1	± 0,1	0,5
10	0,2	± 0,2	1
25	0,5	± 0,5	2,5
50	1	± 1	5
100	1	± 1	10
250	2	± 2	20
500	5	± 5	50
1 000	10	± 10	100
2 000	20	± 20	200

7 Definition of capacity

The capacity corresponding to any graduation line shall be defined as the volume of water at 20 °C, expressed in millilitres, contained by the cylinder at 20 °C when filled to that graduation line.

NOTE — If, exceptionally, the reference temperature is 27 °C, this value shall be substituted for 20 °C.

When checking the capacity of a cylinder, the meniscus shall be set so that the plane of the upper edge of the graduation line is horizontally tangential to the lowest point of the meniscus, the line of sight being in the same plane.