INTERNATIONAL STANDARD 648

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Laboratory glassware — One-mark pipettes

Verrerie de laboratoire — Pipettes à un trait

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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 648 was developed by Technical Committee ISO/TC 48, *Laboratory glassware and related apparatus*, and was circulated to the member bodies in February 1976.

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

Australia	Hungary	Romania
Austria	India	South Africa, Rep. of
Belgium	Israel	Spain
Canada	Italy	United Kingdom
Chile	Mexico	U.S.A.
Czechoslovakia	Netherlands	U.S.S.R.
Germany	Poland	

The member body of the following country expressed disapproval of the document on technical grounds :

France

This International Standard cancels and replaces ISO Recommendation R 648-1968, of which it constitutes a technical revision.

Printed in Switzerland

Laboratory glassware — One-mark pipettes

1 SCOPE AND FIELD OF APPLICATION

This International Standard provides details of an internationally acceptable series of one-mark pipettes, adequate for general laboratory purposes.

The details specified are in conformity with ISO 384.

2 REFERENCES

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

ISO 1769, *Laboratory glassware — Pipettes — Colour coding.*

3 BASIS OF ADJUSTMENT

3.1 Unit of volume

The unit of volume is 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 the 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 pipette is intended to deliver its nominal volume (nominal capacity), is 20 °C.

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

4 VOLUMETRIC ACCURACY

There shall be two classes of accuracy :

- class A for the higher grade;
- class B for the lower grade.

5 SERIES OF CAPACITIES

The series of capacities of one-mark pipettes is as follows :

0,5 — 1 — 2 — 5 — 10 — 20 — 25 — 50 — 100 and 200 ml

Of these, the 0,5 ml size is specified without bulb, the 1 ml size is specified both with and without bulb and the 2 ml size is specified with bulb for class A accuracy, and both with and without bulb for class B accuracy.

All the remaining sizes are specified with bulbs.

All the sizes may be provided with a safety bulb above the graduation line, if required.

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

6 DEFINITION OF CAPACITY

The capacity of a one-mark pipette is defined as the volume of water at 20 °C, expressed in millilitres, delivered by the pipette at 20 °C, when emptied as described below.

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

The pipette in a vertical position shall be filled to a few millimetres above the graduation line and any drop adhering to the jet shall be removed. The falling meniscus shall then be adjusted to the line by one of the two methods detailed below :

a) the meniscus is 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;

b) the meniscus is set so that the plane of the centre of the graduation line is horizontally tangential to the lowest point of the meniscus. The eye is raised towards the plane and observes the front and back portions of the line apparently meeting the lowest point simultaneously.

Any drop adhering to the jet of the pipette shall then be removed by bringing the surface of a glass vessel into contact with the tip of the jet.

Delivery shall then be made, still holding the pipette vertically, into another glass vessel slightly inclined so that the tip of the jet is in contact with the inside of the vessel, but without movement of one against the other throughout the delivery and waiting periods.