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**Laboratory glassware — Graduated  
measuring cylinders**

*Verrerie de laboratoire — Éprouvettes graduées cylindriques*



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## Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 4788 was prepared by Technical Committee ISO/TC 48, *Laboratory glassware and related apparatus*, Subcommittee SC 6, *Laboratory and volumetric ware*.

This second edition cancels and replaces the first edition (ISO 4788:1980), which has been technically revised to incorporate the following changes:

- a) three types of graduated measuring cylinders have been specified;
- b) two classes of accuracy have been introduced;
- c) cylinders of squat form have been added;
- d) marking of cylinders has been changed;
- e) capacity at lowest graduation line for 5 ml and 10 ml cylinders has been increased.

## Introduction

The first edition of this International Standard (ISO 4788:1980) was originally written when the use of measuring cylinders was largely limited to the approximate dispensing of reagents in wet chemical analytical procedures; only one grade of accuracy was specified.

More recently, with the increasing demand for accreditation and changing uses to which measuring cylinders are put, a significant demand has emerged worldwide for a more accurate class to complement the originally specified range.

Also, with more work being carried out in laminar-flow cabinets, glove boxes and fume extraction hoods, in which working heights are restricted, a need for short (squat) measuring cylinders has emerged.

This International Standard addresses these two needs, and has been prepared to meet the requirements of ISO 384. This International Standard includes

- a) spouted measuring cylinders of traditional (tall) form, accuracy classes A and B,
- b) stoppered measuring cylinders of traditional (tall) form, accuracy classes A and B, and
- c) spouted measuring cylinders of squat form, accuracy class B.

Class A has been considered for the third type (squat cylinders) but discounted because ISO 384 requirements would only be met by cylinders having manufacturing specifications which would be virtually impossible to satisfy.

# Laboratory glassware — Graduated measuring cylinders

## 1 Scope

This International Standard specifies dimensions, material and constructional and metrological requirements of graduated measuring cylinders of tall form (Type 1a and Type 1b) and of squat form (Type 2). All types are suitable for general laboratory use.

The specifications in this International Standard are in conformity with the principles of design and construction of volumetric glassware given in ISO 384.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 384:1978, *Laboratory glassware — Principles of design and construction of volumetric glassware*

ISO 719, *Glass — Hydrolytic resistance of glass grains at 98 °C — Method of test and classification*

ISO 4787, *Laboratory glassware — Volumetric glassware — Methods for use and testing of capacity*

## 3 Basis of adjustment

### 3.1 Unit of volume

The unit of volume shall be the millilitre (ml), which is equivalent to the cubic centimetre (cm<sup>3</sup>).

### 3.2 Reference temperature

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

When the cylinder is required for use in a country which has adopted a standard reference temperature of 27 °C; however, this value shall be substituted for 20 °C.