SLOVENSKI STANDARD
SIST EN ISO 4787:2011

01-maj-2011

Nadomešča:
SIST EN ISO 4787:2010

Laboratorijska steklovina - Instrumenti za volumetrična merjenja - Metode za preskušanje zmogljivosti in uporaba (ISO 4787:2010, popravljena verzija 2010-06-15)

Laboratory glassware - Volumetric instruments - Methods for testing of capacity and for use (ISO 4787:2010, Corrected version 2010-06-15)

Laborgeräte aus Glas - Volumenmessgeräte - Prüfverfahren und Anwendung (ISO 4787:2010, korrigierte Fassung 2010-06-15)

Verrerie de laboratoire - Instruments volumétriques - Méthodes de vérification de la capacité et d'utilisation (ISO 4787:2010, Version corrigée 2010-06-15)

Ta slovenski standard je istoveten z: EN ISO 4787:2011

ICS:

17.060	Merjenje prostornine, mase, gostote, viskoznosti	Measurement of volume, mass, density, viscosity
71.040.20	Laboratorijska posoda in aparati	Laboratory ware and related apparatus

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 4787

March 2011

ICS 17.060

Supersedes EN ISO 4787:2010

English Version

Laboratory glassware - Volumetric instruments - Methods for testing of capacity and for use (ISO 4787:2010, Corrected version 2010-06-15)

Verrerie de laboratoire - Instruments volumétriques - Méthodes de vérification de la capacité et d'utilisation (ISO 4787:2010, Version corrigée 2010-06-15)

Laborgeräte aus Glas - Volumenmessgeräte - Prüfverfahren und Anwendung (ISO 4787:2010, korrigierte Fassung 2010-06-15)

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COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

The text of ISO 4787:2010, Corrected version 2010-06-15 has been prepared by Technical Committee ISO/TC 48 “Laboratory equipment” of the International Organization for Standardization (ISO) and has been taken over as EN ISO 4787:2011 by Technical Committee CEN/TC 332 “Laboratory equipment” the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2011, and conflicting national standards shall be withdrawn at the latest by September 2011.

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The text of ISO 4787:2010, Corrected version 2010-06-15 has been approved by CEN as a EN ISO 4787:2011 without any modification.

INTERNATIONAL STANDARD

ISO 4787

Second edition
2010-04-15

Corrected version
2010-06-15

Laboratory glassware — Volumetric instruments — Methods for testing of capacity and for use

Verrerie de laboratoire — Instruments volumétriques — Méthodes de vérification de la capacité et d'utilisation

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Foreword

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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.

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ISO 4787 was prepared by Technical Committee ISO/TC 48, *Laboratory equipment*, Subcommittee SC 6, *Laboratory and volumetric ware*.

This second edition cancels and replaces the first edition (ISO 4787:1984), which has been technically revised to incorporate the following changes:

a) the potassium dichromate cleaning method in Annex A has been deleted;

b) new tables for calculation of test results have been added to Annex B;

c) the description of the test (calibration) methods has been modified to be more precise;

d) test methods have been separated from recommendations for use.

This corrected version of ISO 4787:2010 incorporates the following corrections:

— Figure 1 on page 5 has been corrected to show the correct setting of the meniscus as described in the text;

— Figure 2 on page 5 has been improved to better illustrate what the user of the instrument really sees when setting the meniscus.

Laboratory glassware — Volumetric instruments — Methods for testing of capacity and for use

1 Scope

This International Standard provides methods for the testing, calibration and use of volumetric instruments made from glass in order to obtain the best accuracy in use.

NOTE Testing is the process by which the conformity of the individual volumetric instrument with the appropriate standard is determined, culminating in the determination of its error of measurement at one or more points.

The International Standards for the individual volumetric instruments include clauses on the definition of capacity; these clauses describe the method of manipulation in sufficient detail to define the capacity without ambiguity. This International Standard contains supplementary information.

The procedures are applicable to volumetric instruments with nominal capacities in the range of 0,1 ml to 10 000 ml. These include: single-volume pipettes (see ISO 648) without subdivisions; graduated measuring pipettes and dilution pipettes, with partial or complete subdivisions (see ISO 835); burettes (see ISO 385); volumetric flasks (see ISO 1042); and graduated measuring cylinders (see ISO 4788). The procedures are not recommended for testing of volumetric instruments with capacities below 0,1 ml such as micro-glassware.

This International Standard does not deal specifically with pyknometers as specified in ISO 3507. However, the procedures specified below for the determination of volume of glassware can, for the most part, also be followed for the calibration of pyknometers.

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 385, *Laboratory glassware — Burettes*

ISO 648, *Laboratory glassware — Single-volume pipettes*

ISO 835, *Laboratory glassware — Graduated pipettes*

ISO 1042, *Laboratory glassware — One-mark volumetric flasks*

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 4788, *Laboratory glassware — Graduated measuring cylinders*

ISO/IEC Guide 99, *International vocabulary of metrology — Basic and general concepts and associated terms (VIM)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC Guide 99 apply.

4 Summary of method

The general procedure is based upon a determination of volume of water, either contained in or delivered by the volumetric instrument. This volume of water is based upon knowledge of its mass under consideration of buoyancy and its tabulated density (gravimetric method).

5 Volume and reference temperature

5.1 Unit of volume

The unit of volume shall be the millilitre (ml), which is equivalent to one cubic centimetre (cm^3).

5.2 Reference temperature

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

When the volumetric instrument 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 figure shall be substituted for 20 °C.

6 Apparatus and calibration liquid

6.1 Balance, with a resolution and standard deviation appropriate to the selected volume of the apparatus under test (see Table 1).

The resolution of the display, the standard deviation and the linearity of the balance will be a limiting factor in the accuracy of the measurements. The balance shall be calibrated with adequate accuracy (see 9.4).

Table 1 — Recommended balance

Selected volume under test[a]	Resolution	Standard deviation (repeatability)	Linearity
V	mg	mg	mg
100 µl < $V \leqslant$ 10 ml	0,1	0,2	0,2
10 ml < V < 1 000 ml	1	1	2
1 000 ml $\leqslant V \leqslant$ 2 000 ml	10	10	20
V > 2 000 ml	100	100	200

[a] For practical purposes, the nominal volume may be used to choose the balance.

6.2 Thermometer, to measure the temperature of the calibration liquid (water) with a measurement error of maximum 0,2 °C for liquid volumes < 1 000 ml and with a measurement error of maximum 0,1 °C for liquid volumes $\geqslant$ 1 000 ml.

6.3 Hygrometer, to measure the humidity in the test room with a measurement error of maximum 5 % within the humidity range of 35 % to 85 %.