

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

EVS

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN ISO 4787:2011 sisaldab Euroopa standardi EN ISO 4787:2011 ingliskeelset teksti.

Standard on kinnitatud Eesti Standardikeskuse 31.03.2011 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.

Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 02.03.2011.

Standard on kättesaadav Eesti standardiorganisatsioonist.

This Estonian standard EVS-EN ISO 4787:2011 consists of the English text of the European standard EN ISO 4787:2011.

This standard is ratified with the order of Estonian Centre for Standardisation dated 31.03.2011 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.

Date of Availability of the European standard text 02.03.2011.

The standard is available from Estonian standardisation organisation.

ICS 17.060

Standardite reprodutseerimis- ja levitamiseõigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonilisse süsteemi või edastamine ükskõik millises vormis või millisel teel on keelatud ilma Eesti Standardikeskuse poolt antud kirjaliku loata.

Kui Teil on küsimusi standardite autorikaitse kohta, palun võtke ühendust Eesti Standardikeskusega:
Aru 10 Tallinn 10317 Eesti; www.evs.ee; Telefon: 605 5050; E-post: info@evs.ee

Right to reproduce and distribute belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without permission in writing from Estonian Centre for Standardisation.

If you have any questions about standards copyright, please contact Estonian Centre for Standardisation:
Aru str 10 Tallinn 10317 Estonia; www.evs.ee; Phone: 605 5050; E-mail: info@evs.ee

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)

This European Standard was approved by CEN on 31 January 2011.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

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.

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

This document supersedes EN ISO 4787:2010.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

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.

EVS

Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Summary of method	2
5 Volume and reference temperature	2
5.1 Unit of volume.....	2
5.2 Reference temperature	2
6 Apparatus and calibration liquid	2
7 Factors affecting the accuracy of volumetric instruments	3
7.1 General	3
7.2 Temperature	3
7.3 Cleanliness of glass surface	3
7.4 Quality of used volumetric instruments.....	4
7.5 Delivery time and waiting time	4
8 Setting the meniscus	4
8.1 General	4
8.2 Meniscus of transparent liquids	4
8.3 Meniscus of opaque liquids	5
9 Calibration procedure	5
9.1 General	5
9.2 Test room	5
9.3 Filling and delivery	6
9.4 Weighing.....	7
9.5 Evaluation.....	7
10 Use	7
10.1 General	7
10.2 Volumetric flasks (see ISO 1042)	8
10.3 Measuring cylinders (see ISO 4788)	8
10.4 Burettes (see ISO 385).....	8
10.5 Pipettes.....	9
Annex A (informative) Cleaning of volumetric glassware	10
Annex B (normative) Calculation of volume	11
Bibliography	21

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 pycnometers 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 pycnometers.

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)*