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STN	**Piestové odmerné prístroje Časť 7: Alternatívne metódy merania na stanovenie objemu (ISO 8655-7: 2022)**	**STN EN ISO 8655-7 70 4110**

Piston-operated volumetric apparatus - Part 7: Alternative measurement procedures for the determination of volume (ISO 8655-7:2022)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 08/22

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EN ISO 8655-7

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ICS 17.060

Supersedes EN ISO 8655-7:2005, EN ISO 8655-7:2005/AC:2009

English Version

Piston-operated volumetric apparatus - Part 7: Alternative measurement procedures for the determination of volume (ISO 8655-7:2022)

Appareils volumétriques à piston - Partie 7: Modes opératoires de mesure alternatifs pour la détermination de volumes (ISO 8655-7:2022)

Volumenmessgeräte mit Hubkolben - Teil 7: Alternatives Prüfverfahren zur Bestimmung des Volumens (ISO 8655-7:2022)

This European Standard was approved by CEN on 13 February 2022.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
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EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN ISO 8655-7:2022) has been prepared by Technical Committee ISO/TC 48 "Laboratory equipment" in collaboration with 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of an identical text or by endorsement, at the latest by November 2022, and conflicting national standards shall be withdrawn at the latest by November 2022.

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

This document supersedes EN ISO 8655-7:2005, EN ISO 8655-7:2005/AC:2009.

Any feedback and questions on this document should be directed to the users’ national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Endorsement notice

The text of ISO 8655-7:2022 has been approved by CEN as EN ISO 8655-7:2022 without any modification.

INTERNATIONAL STANDARD

ISO 8655-7

Second edition
2022-04

Piston-operated volumetric apparatus —

Part 7: Alternative measurement procedures for the determination of volume

Appareils volumétriques à piston —

Partie 7: Modes opératoires de mesure alternatifs pour la détermination de volumes

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 48, *Laboratory equipment*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 332, *Laboratory equipment*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 8655-7:2005), which has been technically revised. It also incorporates the Technical Corrigendum ISO 8655-7:2005/Cor.1:2008.

The main changes are as follows:

— a gravimetric test method was added (see 8.2);

— a photometric/gravimetric hybrid test method was added (see 8.5);

— a batch testing method was added (see 8.7);

— measurement procedures for all methods are given in normative Annexes A to E;

— standard dispense procedures for POVA described in ISO 8655-2, ISO 8655–3, ISO 8655–4, ISO 8655–5, and ISO 8655–9 were added (see Clause 9);

— requirements for operator qualification have been added (see 4.3);

— requirements for testing of multi-channel POVA is described in more detail, with specific procedures given for these apparatus (see 8.5, and Annex D);

— Annexes A, B, and C of the first edition have been deleted and replaced.

A list of all parts in the ISO 8655 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The ISO 8655 series addresses the needs of:

— manufacturers, as a basis for quality control including, where appropriate, the issuance of manufacturer's declarations;

— calibration laboratories, test houses, users of the equipment and other bodies as a basis for independent calibration, testing, verification, and routine tests.

The tests specified in the ISO 8655 series are intended to be carried out by trained personnel.

INTERNATIONAL STANDARD **ISO 8655-7:2022(E)**

Piston-operated volumetric apparatus —

Part 7: Alternative measurement procedures for the determination of volume

1 Scope

This document specifies alternative measurement procedures for the determination of volume of piston-operated volumetric apparatus.

The procedures are applicable to complete systems comprising the basic apparatus and all parts selected for use with the apparatus, disposable or reusable, involved in the measurement by delivery process (Ex). Methods described in this document are suitable for various maximum nominal volumes of piston-operated volumetric apparatus. It is the responsibility of the user to select the appropriate method.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 1042, *Laboratory glassware — One-mark volumetric flasks*

ISO 2859-1, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

ISO 3696:1987, *Water for analytical laboratory use — Specification and test methods*

ISO 3951-1, *Sampling procedures for inspection by variables — Part 1: Specification for single sampling plans indexed by acceptance quality limit (AQL) for lot-by-lot inspection for a single quality characteristic and a single AQL*

ISO 8655-1, *Piston-operated volumetric apparatus — Part 1: Terminology, general requirements and user recommendations*

ISO 8655-2, *Piston-operated volumetric apparatus — Part 2: Pipettes*

ISO 8655-3, *Piston-operated volumetric apparatus — Part 3: Burettes*

ISO 8655-4, *Piston-operated volumetric apparatus — Part 4: Dilutors*

ISO 8655-5, *Piston-operated volumetric apparatus — Part 5: Dispensers*

ISO 8655-6, *Piston-operated volumetric apparatus — Part 6: Gravimetric reference measurement procedure for the determination of volume*

ISO 8655-8, *Piston-operated volumetric apparatus — Part 8: Photometric reference measurement procedure for the determination of volume*

ISO 8655-9, *Piston-operated volumetric apparatus — Part 9: Manually operated precision laboratory syringes*

ISO/IEC Guide 2, *Standardization and related activities — General vocabulary*

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

NOTE For further information on uncertainty for the photometric and gravimetric methods, refer to ISO/TR 16153[1] and ISO/TR 20461[2] respectively.

4.3 Operator qualification

An operator who uses POVA for volumetric transfers, performs metrological confirmation or routine tests of POVA shall be adequately trained on the use of the type of POVA under test. Operator training and competence should be documented.

NOTE 1 Previously calibrated POVA can be used for the qualification of operators.