SLOVENSKI STANDARD
oSIST prEN ISO 8655-1:2020

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Volumetrične naprave, delujoče na bat - 1. del: Terminologija, splošne zahteve in priporočila za uporabnike (ISO/DIS 8655-1:2020)

Piston-operated volumetric apparatus - Part 1: Terminology, general requirements and user recommendations (ISO/DIS 8655-1:2020)

Volumenmessgeräte mit Hubkolben - Teil 1: Begriffe, allgemeine Anforderungen und Gebrauchsempfehlungen (ISO/DIS 8655-1:2020)

Appareils volumétriques à piston - Partie 1: Définitions, exigences générales et recommandations pour l'utilisateur (ISO/DIS 8655-1:2020)

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Piston-operated volumetric apparatus —

Part 1:
Terminology, general requirements and user recommendations

Appareils volumétriques à piston —

Partie 1: Définitions, exigences générales et recommandations pour l'utilisateur

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Contents

Page

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 on 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 the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 48, *Laboratory Equipment*, Working Group WG 4, *Piston-operated instruments*.

This second edition cancels and replaces the first edition (ISO 8655-1:2002 and ISO 8655-1:2002/Cor 1:2008), which has been technically revised.

The main changes compared to the previous edition are as follows:

— ISO 8655-7, ISO 8655-8, and ISO 8655-9 have been added as a normative references;

— Abbreviated terms have been introduced as Clause 4;

— Terms and definitions have been revised;

— General requirements for measurement capability and reference measurement have been added.

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

ISO 8655 addresses the needs of:

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

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

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

Piston-operated volumetric apparatus —

Part 1: Terminology, general requirements and user recommendations

1 Scope

This part of ISO 8655 specifies general requirements for piston-operated volumetric apparatus (POVA). It is applicable to pipettes, burettes, dilutors, dispensers and manually operated precision laboratory syringes. It furthermore defines terms for the use of piston-operated volumetric apparatus and gives user recommendations.

ISO 8655 is not applicable to medical products intended for use on humans, e.g. for medical syringes.

NOTE For the metrological requirements, maximum permissible errors, requirements for marking and information to be provided for users of piston-operated volumetric apparatus, see ISO 8655-2 for pipettes, see ISO 8655-3 for burettes, see ISO 8655-4 for dilutors, see ISO 8655-5 for dispensers, and see ISO 8655-9 for manually operated precision laboratory syringes. The gravimetric reference measurement procedure for the determination of volume is given in ISO 8655-6. The photometric reference measurement procedure for the determination of volume is given in ISO 8655-8. Alternative measurement procedures for the determination of volume are described in ISO 8655-7.

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 8655-2:2020, *Piston-operated volumetric apparatus — Part 2: Pipettes*

ISO 8655-3:2020, *Piston-operated volumetric apparatus — Part 3: Burettes*

ISO 8655-4:2020, *Piston-operated volumetric apparatus — Part 4: Dilutors*

ISO 8655-5:2020, *Piston-operated volumetric apparatus — Part 5: Dispensers*

ISO 8655-6:2020, *Piston-operated volumetric apparatus — Part 6: Gravimetric reference measurement procedure for the determination of volume*

ISO 8655-7:2020, *Piston-operated volumetric apparatus — Part 7: Alternative measurement procedures for the determination of volume*

ISO 8655-8:2020, *Piston-operated volumetric apparatus — Part 8: Photometric reference measurement procedure for the determination of volume*

ISO 8655-9:2020, *Piston-operated volumetric apparatus — Part 9: Manually operated precision laboratory syringes*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
absorbance drift
change in measured absorbance at a specific wavelength over time due to photometer characteristics

3.2
accuracy of measurement
⟨piston-operated volumetric apparatus⟩ closeness of agreement between delivered volume and the nominal or selected volume

Note 1 to entry: The concept 'accuracy' is not given a numerical value. Accuracy is a combination of trueness and precision and can be assessed with both the systematic error and the random error and will be affected by both.

Note 2 to entry: The term 'accuracy' is not the same as 'trueness".

Note 3 to entry: The measurement uncertainty of a single delivered volume is used to quantitatively express the accuracy of a measurement.

[SOURCE: ISO/IEC Guide 99: 2007, 2.13, modified for the purpose of the POVA standard]

3.3
adjustment
⟨piston-operated volumetric apparatus⟩ set of operations carried out so that the delivered volume more closely corresponds to the nominal or selected volume

Note 1 to entry: Information about the correct adjustment method can be found in the manufacturer's instruction manual. Some devices have more than one adjustment method.

[SOURCE: ISO/IEC Guide 99: 2007, 3.11, modified for the purpose of the POVA standard]

3.4
balance
⟨piston-operated volumetric apparatus⟩ device to determine the mass of a delivered volume

Note 1 to entry: An analytical balance is a balance that has a readability of 0.1 mg or smaller.

Note 2 to entry: The readability is the smallest difference in mass that can be read on the balance.

3.5
bandpass filter
optical filter used to selectively transmit a band of wavelengths from the total spectrum while rejecting shorter and longer wavelengths than those within the transmission band

3.6
baseline drift
photometric drift
photometric stability
change in the baseline absorbance at a specific wavelength over time

Note 1 to entry: Temperature fluctuations can influence the photometric stability.

3.7
baseline flatness
measure of the photometer's ability to compensate for inherent optical and electronic noise across the wavelength range of interest without any sample in the sample compartment

3.8
calibration
⟨piston-operated volumetric apparatus⟩ set of operations that establish the relationship between the delivered volume and the corresponding nominal or selected volume of the apparatus with measurement uncertainties

Note 1 to entry: Calibration requires no operation which permanently modifies the apparatus and does not require adjustment of the device.

[SOURCE: ISO/IEC Guide 99: 2007, 2.39, modified for the purpose of the POVA standard]

3.9
coefficient of variation
the random error expressed as a percentage of the mean delivered volume

3.10
correction
mathematical compensation of a systematic effect

Note 1 to entry: In the context of this standard, a systematic error can be mathematically compensated by subtracting the systematic error from the measured value.

Note 2 to entry: The correction is applied when the user is setting the indication in order to deliver the corrected intended volume.

[SOURCE: ISO/IEC Guide 99: 2007, 2.53, modified for the purpose of the POVA standard]

3.11
chromophore
compound which absorbs photons of a specific energy

3.12
dead air volume
headspace
captive air volume
air cushion
⟨air displacement pipettes⟩ air volume between the piston and the surface of the liquid in the tip

3.13
dead liquid volume
⟨piston-operated volumetric apparatus⟩ amount of liquid which does not belong to the delivered volume and which is contained during operation in aspiration or expelling tubes, valves and within the cylinder

3.14
evaporation trap
accessory of a balance that minimizes evaporation of test liquid in the weighing vessel

3.15
immersion depth
⟨piston pipette⟩ depth of the tip orifice of the piston pipette below the liquid surface

3.16
liquid handling process tolerance
user-specified tolerance defining the maximum acceptable uncertainty in use of the delivered volume

Note 1 to entry: A POVA is fit for its intended purpose if its uncertainty in use is smaller than or equal to the liquid handling process tolerance.

Note 2 to entry: The liquid handling process tolerance is typically expressed as a percentage of the nominal or selected volume.