BS EN ISO 8222:2020+A1:2022

BSI Standards Publication

Petroleum measurement systems — Calibration — Volumetric measures, proving tanks and field measures (including formulae for properties of liquids and materials)

bsi.

National foreword

This British Standard is the UK implementation of EN ISO 8222:2020+A1:2022. It is identical to ISO 8222:2020, incorporating amendment 1:2022. It supersedes BS EN ISO 8222:2020, which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to ISO text carry the number of the ISO amendment. For example, text altered by ISO amendment 1 is indicated by ▌A1〉 〈A1▐.

The UK participation in its preparation was entrusted to Technical Committee PTI/12, Petroleum Measurement and Sampling.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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28 February 2022	Implementation of ISO amendment 1:2022 with CEN endorsement A1:2022

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 8222

April 2020

ICS 75.180.30

Supersedes EN ISO 8222:2002

English Version

Petroleum measurement systems - Calibration - Volumetric measures, proving tanks and field measures (including formulae for properties of liquids and materials) (ISO 8222:2020)

Systèmes de mesure du pétrole - Étalonnage - Contenants de mesure volumétriques, jauges étalons et contenants de mesure de travail (y compris les formules relatives aux propriétés des liquides et des matériaux) (ISO 8222:2020)

Messsysteme für Mineralölerzeugnisse - Kalibrierung - Temperaturkorrekturen zur Anwendung auf volumetrische Bezugsmessbehälter (ISO 8222:2020)

This European Standard was approved by CEN on 17 February 2020.

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.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

This document (EN ISO 8222:2020) has been prepared by Technical Committee ISO/TC 28 "Petroleum and related products, fuels and lubricants from natural or synthetic sources" in collaboration with Technical Committee CEN/TC 19 “Gaseous and liquid fuels, lubricants and related products of petroleum, synthetic and biological origin.” the secretariat of which is held by NEN.

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 October 2020, and conflicting national standards shall be withdrawn at the latest by October 2020.

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 8222:2002.

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 8222:2020 has been approved by CEN as EN ISO 8222:2020 without any modification.

European foreword to amendment A1:2022

This document (EN ISO 8222:2020+A1:2022) has been prepared by Technical Committee ISO/TC 28 "Petroleum and related products, fuels and lubricants from natural or synthetic sources" in collaboration with Technical Committee CEN/TC 19 “Gaseous and liquid fuels, lubricants and related products of petroleum, synthetic and biological origin” the secretariat of which is held by NEN.

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 July 2022, and conflicting national standards shall be withdrawn at the latest by July 2022.

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Endorsement notice to amendment A1:2022

The text of ISO 8222:2020+A1:2022 has been approved by CEN as EN ISO 8222:2020+A1:2022 without any modification.

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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 28, *Petroleum and related products, fuels and lubricants from natural or synthetic sources*, Subcommittee SC 2, *Measurement of petroleum and related products*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 19, *Gaseous and liquid fuels, lubricants and related products of petroleum, synthetic and biological origin*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 8222:2002), which has been technically revised. The main changes to the previous edition are as follows:

— revision of the title and scope to allow the document to cover the design, calibration and use of a wide range of volumetric measures comprising proving tanks, test measures, field and standard measures;

— provision of revised, updated and extended formulae to allow calculation of temperature correction including the addition of formulae for saline water, other liquids and material properties.

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

Volumetric, or capacity, measures are used to provide an accurate measure of volume, thereby providing a calibration reference for other volume-measuring devices, such as pipe displacement provers or flowmeters.

Volume measures are categorized in terms of capacity, test measures being below 20 l. Measures above 20 l are categorised as prover tanks. Standard measures are designed to comply with regulatory guidance and hence have specified volumes. Other measures have non-standard volumes specifically designed to suit an application, for example measures to accompany a small volume prover.

Volumetric measures can be used to calibrate flowmeters, both duty and reference meters. They can also be used to calibrate secondary volume measures, displacement (pipe) provers and storage tanks.

Annex A provides the recommended formulae used in the calibration and use of volumetric measures and for other volumetric measurements. This includes pure and saline water properties, the properties of hydrocarbon liquids and the materials of construction of volumetric measuring devices.

INTERNATIONAL STANDARD **ISO 8222:2020**

Petroleum measurement systems — Calibration — Volumetric measures, proving tanks and field measures (including formulae for properties of liquids and materials)

WARNING — The use of this document could involve hazardous materials, operations and equipment. This document does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this document to establish appropriate safety and health practices.

1 Scope

This document describes the design, use and calibration of volumetric measures (capacity measures) which are intended for use in fixed locations in a laboratory or in the field. This document gives guidance on both standard and non-standard measures. It also covers portable and mobile measures. This document is applicable to the petroleum industry; however, it may be applied more widely to other applications.

This document excludes measures for cryogenic liquids and pressurized measures as used for liquid petroleum gas (LPG) and liquefied natural gas (LNG).

Volumetric measures are classified as test measures or prover tanks depending on capacity and design.

Measures described in this document are primarily designed, calibrated and used to measure volumes from a measure which is wetted and drained for a specified time before use and designated to deliver. Many of the provisions, however, apply equally to measures which are used to measure a volume using a clean and dry measure and designated to contain.

Guidance is given regarding commonly expected uncertainties and calibration specifications.

The document also provides, in Annex A, reference formulae describing the properties of water and other fluids and materials used in volumetric measurement more generally.

2 Normative references

There are no normative references in this document.

3 Terms, definitions, symbols and units

3.1 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/