

SLOVENSKI STANDARD

SIST EN ISO 8222:2003

01-februar-2003

BUXca Yý U
SIST EN ISO 8222:1998

Naftni merilni sistemi - Umerjanje - Uporaba temperaturnih popravkov pri umerjanju etalonskih posod (ISO 8222:2002)

Petroleum measurement systems - Calibration - Temperature corrections for use when calibrating volumetric proving tanks (ISO 8222:2002)

Messsysteme für Mineralölzeugnisse - Kalibrierung - Temperaturkorrekturen zur Anwendung auf volumetrische Bezugsmessbehälter (ISO 8222:2002)

Systemes de mesure du pétrole - Etalonnage - Corrections de température a utiliser lors de l'étalonnage des jauges étalons (ISO 8222:2002)

Ta slovenski standard je istoveten z: EN ISO 8222:2002

ICS:

75.180.30	Oprema za merjenje prostornine in merjenje	Volumetric equipment and measurements
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en

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EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 8222

November 2002

ICS 75.180.30

Supersedes EN ISO 8222:1995

English version

Petroleum measurement systems - Calibration - Temperature corrections for use when calibrating volumetric proving tanks (ISO 8222:2002)

Systèmes de mesure du pétrole - Etalonnage - Corrections de température à utiliser lors de l'étalonnage des jauges étalons (ISO 8222:2002)

Messsysteme für Mineralölerzeugnisse - Kalibrierung - Temperaturkorrekturen zur Anwendung auf volumetrische Bezugsmessbehälter (ISO 8222:2002)

This European Standard was approved by CEN on 9 October 2002.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Management Centre: rue de Stassart, 36 B-1050 Brussels

EN ISO 8222:2002 (E)

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Foreword

This document (EN ISO 8222:2002) has been prepared by Technical Committee ISO/TC 28 "Petroleum products and lubricants" in collaboration with Technical Committee CEN/TC 19 "Petroleum products, lubricants and related products", 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 May 2003, and conflicting national standards shall be withdrawn at the latest by May 2003.

This document supersedes EN ISO 8222:1995.

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

Endorsement notice

The text of ISO 8222:2002 has been approved by CEN as EN ISO 8222:2002 without any modifications.

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INTERNATIONAL STANDARD

**ISO
8222**

Second edition
2002-11-01

Petroleum measurement systems — Calibration — Temperature corrections for use when calibrating volumetric proving tanks

*Systèmes de mesure du pétrole — Étalonnage — Corrections de
température à utiliser lors de l'étalonnage des jauges étalons*

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Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.ch
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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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.

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

International Standard ISO 8222 was prepared by Technical Committee ISO/TC 28, *Petroleum products and lubricants*, Subcommittee SC 3, *Static petroleum measurement*.

This second edition cancels and replaces the first edition (ISO 8222:1987), which has been technically revised.

This revision includes an equation for calculation of the density of water in the range 1,0 °C to 40 °C derived from density determinations on water carried out at the CSIRO National Measurement Laboratory, Australia, and published in 1994. It is expressed in terms of the International Temperature Scale of 1990, ITS-90. The equation in ISO 8222:1987 was based on work published in 1971 by PTB, Germany, expressed in terms of the International Practical Temperature Scale of 1968, IPTS-68.

Annex A forms a normative part of this International Standard. Annex B is for information only.

Introduction

When meter proving tanks or other containers are calibrated with a primary measure using water, correction factors are required to make allowance for the effects of temperature during the calibration on the volume of water that is transferred and on the capacities of the primary measure and container.

The corrections take account of differences in the volume of water, and of the capacities of the measure and the tank, arising from the following temperature-related effects.

- a) The change in volume of the calibrating liquid (water) caused by any change in its temperature from the time it is measured in the measure to the time when the total volume has been transferred to or drawn from the tank being calibrated.

NOTE Although this International Standard is applicable to volumes transferred to, or drawn from, a tank, it has been written in terms of the volume transferred to the tank.

- b) Changes in the capacities of the measure and the tank being calibrated caused by any differences between the temperatures of their shells and their standard reference (calibration) temperature(s).

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Petroleum measurement systems — Calibration — Temperature corrections for use when calibrating volumetric proving tanks

1 Scope

This International Standard specifies multiplication factors for the correction of the volume of water transferred from a primary measure to a tank for changes arising from temperature differences during the determination of the capacity of the tank at reference temperature.

NOTE This International Standard does not set out a calibration procedure nor consider the uncertainties in temperature measurement, for which reference should be made to other standards.

Equations are given in annex A for the determination of the density of air-free and air-saturated, pure water in the temperature range 1,0 °C to 40 °C for temperatures expressed in terms of the ITS-90 International Temperature Scale.

A calculation routine is also provided in annex B for the combined water and metal correction factor that is applied when determining the capacity of the tank at reference temperature.

2 Symbols and definitions

For the purposes of this International Standard, the symbols defined in Table 1 apply.

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Table 1 — Symbols

Symbol	Quantity	Unit
C_c	Combined correction factor	1
C_{tdw}	Correction factor for expansion of the calibrating liquid (water) over the temperature range t_1 to t_2 where $C_{tdw} = \frac{\rho_1}{\rho_2}$	1
t_{sm}	Standard reference temperature of the measure	°C
t_{st}	Standard reference temperature of the tank being calibrated	°C
t_1	Temperature of the water in the measure and of its shell	°C
t_2	Temperature of the water in the tank being calibrated at the completion of the calibration and of the shell of the tank	°C
α_{V1}	Cubical expansion coefficient of the shell of the measure	°C ⁻¹
α_{V2}	Cubical expansion coefficient of the shell of the tank being calibrated	°C ⁻¹
ρ_1	Density of water at temperature t_1	kg/m ³
ρ_2	Density of water at temperature t_2	kg/m ³

3 Temperatures

3.1 The corrections apply for temperatures in the range 1,0 °C to 40 °C.

For practical reasons, the temperature difference between the temperature of the measure and that of the tank shall not exceed 5,0 °C.