SLOVENSKI STANDARD
SIST EN ISO 4259-5:2024

01-marec-2024

Nafta in sorodni proizvodi - Natančnost merilnih metod in rezultatov - 5. del: Statistična ocena skladnosti med dvema različnima merilnima metodama, za kateri velja trditev, da merita isto lastnost (ISO 4259-5:2023)

Petroleum and related products - Precision of measurement methods and results - Part 5: Statistical assessment of agreement between two different measurement methods that claim to measure the same property (ISO 4259-5:2023)

Mineralölerzeugnisse - Präzision von Messverfahren und Ergebnissen - Teil 5: Statistische Bewertung der Übereinstimmung zweier verschiedener Messverfahren die vorgeben, dieselbe Eigenschaft zu messen (ISO 4259-5:2023)

Produits pétroliers et connexes - Fidélité des méthodes de mesure et de leurs résultats - Partie 5: Évaluation statistique de l'accord entre deux méthodes de mesure différentes qui prétendent mesurer la même propriété(ISO 4259-5:2023)

Ta slovenski standard je istoveten z: **EN ISO 4259-5:2024**

ICS:

75.080	Naftni proizvodi na splošno	Petroleum products in general
75.180.20	Predelovalna oprema	Processing equipment

SIST EN ISO 4259-5:2024 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 4259-5

January 2024

ICS 75.080

English Version

Petroleum and related products - Precision of measurement methods and results - Part 5: Statistical assessment of agreement between two different measurement methods that claim to measure the same property (ISO 4259-5:2023)

Produits pétroliers et connexes - Fidélité des méthodes de mesure et de leurs résultats - Partie 5: Évaluation statistique de l'accord entre deux méthodes de mesure différentes qui prétendent mesurer la même propriété(ISO 4259-5:2023)

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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

Ref. No. EN ISO 4259-5:2024 E

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European foreword

This document (EN ISO 4259-5:2024) 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 2024, and conflicting national standards shall be withdrawn at the latest by July 2024.

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.

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Endorsement notice

The text of ISO 4259-5:2023 has been approved by CEN as EN ISO 4259-5:2024 without any modification.

INTERNATIONAL STANDARD

ISO 4259-5

First edition
2023-12

Petroleum and related products — Precision of measurement methods and results —

Part 5: Statistical assessment of agreement between two different measurement methods that claim to measure the same property

Produits pétroliers et connexes — Fidélité des méthodes de mesure et de leurs résultats —

Partie 5: Évaluation statistique de l'accord entre deux méthodes de mesure différentes qui prétendent mesurer la même propriété

Reference number
ISO 4259-5:2023(E)

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Published in Switzerland

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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 document 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).

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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,* 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).

A list of all parts in the ISO 4259 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

This document explains the statistical methodology for assessing the expected agreement between two standardized test methods that purport to measure the same property of a material. Subsequently, it is investigated whether a linear bias correction can significantly improve the expected agreement. The degree of agreement is expressed as a between-methods reproducibility after a bias correction (if necessary) has been applied.

The method uses numerical results from a set of samples that have been analysed independently using both test methods by different laboratories. The variation associated with each test method result is used for assessing the required bias correction.

Annexes A and B give worked out examples showing how the methodology is applied.

Petroleum and related products — Precision of measurement methods and results —

Part 5: Statistical assessment of agreement between two different measurement methods that claim to measure the same property

1 Scope

This document specifies statistical methodology for assessing the expected agreement between two test methods that purport to measure the same property of a material, and for deciding if a simple linear bias correction can further improve the expected agreement.

This document is applicable for analytical methods which measure quantitative properties of petroleum or petroleum products resulting from a multi-sample-multi-lab study (MSMLS). These types of studies include but are not limited to interlaboratory studies (ILS) meeting the requirements of ISO 4259-1 or equivalent, and proficiency testing programmes (PTP) meeting the requirements of ISO 4259-3 or equivalent.

The methodology specified in this document establishes the limiting value for the difference between two results where each result is obtained by a different operator using different apparatus and two methods X and Y, respectively, on identical material. One of the methods (X or Y) has been appropriately bias-corrected to agree with the other in accordance with this practice. This limit is designated as the between-methods reproducibility. This value is expected to be exceeded with a probability of 5 % under the correct and normal operation of both test methods due to random variation.

NOTE Further conditions for application of this methodology are given in 5.1 and 5.2.

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 4259-1, *Petroleum and related products — Precision of measurement methods and results — Part 1: Determination of precision data in relation to methods of test*

ISO 4259-3, *Petroleum and related products — Precision of measurement methods and results — Part 3: Monitoring and verification of published precision data in relation to methods of test*

ISO 4259-4, *Petroleum and related products — Precision of measurement methods and results — Part 4: Use of statistical control charts to validate 'in-statistical-control' status for the execution of a standard test method in a single laboratory*

3 Terms and definitions

For the purposes of this document, the terms and definitions in ISO 4259-1 and the following terms and definitions apply.

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

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

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

3.1
multi-sample-multi-lab study
MSMLS
study in which one or more performance characteristics are determined on the basis of analytical results from multiple samples and multiple laboratories

Note 1 to entry: Under certain conditions, inter laboratory studies and proficiency testing schemes meet this definition of multi-sample-multi-lab study.

3.2
interlaboratory study
ILS
study specifically designed to estimate the repeatability and reproducibility of a standard test method achieved at a fixed point in time by multiple laboratories through the statistical analysis of their test results obtained on aliquots prepared from multiple materials

3.3
proficiency testing programme
PTP
programme designed for the periodic evaluation testing capability of participating laboratories of a standard test method through the statistical analysis of their test results obtained on aliquots prepared from a single batch of homogeneous material

Note 1 to entry: PTP is sometimes referred to as a proficiency testing (PT)-study or an interlaboratory cross check programme (ILCP).

3.4
between-methods bias correction
quantitative expression of the mathematical correction, when applied to the outcome of either one of two methods claiming to measure the same property, can result in a statistically significant improvement between the expected values of the two test methods claiming to measure the same property

3.5
correlation coefficient
ρ
statistical measure of the strength and direction of the relationship between two variables

Note 1 to entry: Values always range between −1 (strong negative relationship) and +1 (strong positive relationship). Values at or close to zero imply a weak or nonlinear relationship.

3.6
standard error
Δ_E
statistic estimating the standard deviation of the distribution of the average statistic obtained from the repeat random sampling of a population

3.7
sample standard deviation
s_i
estimator of the population standard deviation using the sample mean and sample size

Note 1 to entry: Sample standard deviation is also referred to as standard deviation of the sample.