

STN	Presnosť (správnosť a zhodnosť) metód a výsledkov merania Časť 4: Základné metódy stanovenia správnosti normalizovanej metódy merania	STN ISO 5725-4 01 0251
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Accuracy (trueness and precision) of measurement methods and results

Part 4: Basic methods for the determination of the trueness of a standard measurement method

Exactitude (justesse et fidélité) des résultats et méthodes de mesure

Partie 4: Méthodes de base pour la détermination de la justesse d'une méthode de mesure normalisée

Táto slovenská technická norma obsahuje anglickú verziu medzinárodnej normy ISO 5725-4: 2020 a má postavenie oficiálnej verzie.

This Slovak standard includes the English version of the International standard ISO 5725-4: 2020 and has the status of the official version.



139752

Úrad pre normalizáciu, metrológiu a skúšobníctvo Slovenskej republiky, 2025

Slovenská technická norma a technická normalizačná informácia je chránená zákonom č. 60/2018 Z. z. o technickej normalizácii v znení neskorších predpisov.

Anotácia

Tento dokument

- špecifikuje základné metódy na odhadovanie odchýlky metódy merania a laboratórnej odchýlky, keď sa používa metóda merania;
- poskytuje praktický prístup základnej metódy na rutinné použitie pri odhadovaní odchýlky metód merania a laboratórnej odchýlky;
- poskytuje stručné usmernenie pre všetkých pracovníkov, ktorí sa zaoberajú navrhovaním, vykonávaním alebo analyzovaním výsledkov meraní na odhad odchýlky.

Národný predhovor

Normatívne referenčné dokumenty

Na nasledujúce dokumenty sa odkazuje v texte takým spôsobom, že časť ich obsahu alebo celý obsah predstavuje požiadavky tohto dokumentu. Pri datovaných odkazoch sa používa len citované vydanie. Pri nedatovaných odkazoch sa používa najnovšie vydanie citovaného dokumentu (vrátane akýchkoľvek zmien).

POZNÁMKA 1. – Ak bola medzinárodná publikácia zmenená spoločnými modifikáciami, čo je indikované označením (mod), použije sa príslušná EN/HD.

POZNÁMKA 2. – Aktuálne informácie o platných a zrušených STN a TNI možno získať na webovom sídle www.unms.sk.

ISO 3534-1 prijatá ako STN ISO 3534-1 Štatistika. Slovník a značky. Časť 1: Všeobecné štatistické termíny a termíny používané v teórii pravdepodobnosti (01 0216)

ISO 3534-2 prijatá ako STN ISO 3534-2 Štatistika. Slovník a značky. Časť 2: Aplikovaná štatistika (01 0216)

ISO 5725-1 prijatá ako STN ISO 5725-1 Presnosť (správnosť a zhodnosť) metód a výsledkov merania. Časť 1: Všeobecné zásady a definície (01 0251)

ISO 5725-2 dosiaľ neprijatá

ISO Guide 30 dosiaľ neprijatý

Vypracovanie

Spracovateľ: Úrad pre normalizáciu, metrológiu a skúšobníctvo Slovenskej republiky, Bratislava

Technická komisia: TK 71 Aplikácie štatistických metód

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ISO 5725-4:2020(E)

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 69, Subcommittee SC 6, *Measurement methods and results*.

This second edition cancels and replaces the first edition (ISO 5725-4:1994), which has been technically revised.

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

- clearly recognizing the requirements of the accepted reference values used in bias evaluation experiments and introducing the uncertainties of the accepted reference values,
- changing examples with a currently used measurement method.

A list of all parts in the ISO 5725 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 5725 uses two terms, “trueness” and “precision”, to describe the accuracy of a measurement method. “Trueness” refers to the closeness of agreement between the expectation of a measurement result and a true value. “Precision” refers to the closeness of agreement between independent measurement results obtained under stipulated conditions.

General consideration of these quantities is given in ISO 5725-1 and so is not repeated in this document. ISO 5725-1 should be read in conjunction with all other parts of ISO 5725, including this document, because it gives the underlying definitions and general principles.

The “trueness” of a measurement method is of interest when it is possible to conceive of a true value for the property being measured. Although the true value cannot be known exactly, it can be possible to have an accepted reference value for the property being measured; for example, if suitable reference materials or measurement standards are available, or if the accepted reference value can be established by reference to another measurement method or by preparation of a known sample. The trueness of the measurement method can be investigated by comparing the accepted reference value with the level of the results given by the measurement method. Trueness is normally expressed in terms of bias. Bias can arise, for example, in chemical analysis if the measurement method fails to extract all of an element, or if the presence of one element interferes with the determination of another.

Two measures of trueness are of interest and both are considered in this document.

- a) Bias of the measurement method: where there is a possibility that the measurement method can give rise to a bias, which persists wherever and whenever the measurement is done, then it is of interest to investigate the “bias of the measurement method”. This requires an experiment involving many laboratories.
- b) Laboratory bias: measurements within a single laboratory can reveal the “laboratory bias” (as defined in ISO 5725-1). If it is proposed to undertake an experiment to estimate laboratory bias, then it should be realized that the estimate is valid only at the time of the experiment and at the investigated level(s) for the property. Further regular testing is required to show that the laboratory bias does not vary; the method described in ISO 5725-6 can be used for this.

Accuracy (trueness and precision) of measurement methods and results —

Part 4:

Basic methods for the determination of the trueness of a standard measurement method

1 Scope

1.1 This document

- specifies basic methods for estimating the bias of a measurement method and the laboratory bias when a measurement method is applied;
- provides a practical approach of a basic method for routine use in estimating the bias of measurement methods and laboratory bias;
- provides a brief guidance to all personnel concerned with designing, performing or analysing the results of the measurements for estimating bias.

1.2 It is concerned exclusively with measurement methods which yield measurements on a continuous scale and give a single value as the measurement result, although the single value can be the outcome of a calculation from a set of observations.

1.3 This document applies when the measurement method has been standardized and all measurements are carried out according to that measurement method.

NOTE In ISO/IEC Guide 99:2007(VIM), “measurement procedure” (2.6) is an analogous term related to the term “measurement method” used in this document.

1.4 This document applies only if an accepted reference value can be established to substitute the true value by using the value, for example:

- of a suitable reference material;
- of a suitable measurement standard;
- referring to a suitable measurement method;
- of a suitable prepared known sample.

1.5 This document applies only to the cases where it is sufficient to estimate bias on one property at a time. It is not applicable if the bias in the measurement of one property is affected by the level of any other property (i.e. it does not consider interferences by any influencing quantity). Comparison of the trueness of two-measurement methods is considered in ISO 5725-6.

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 5725-4:2020(E)

ISO 3534-1, *Statistics — Vocabulary and symbols — Part 1: General statistical terms and terms used in probability*

ISO 3534-2, *Statistics — Vocabulary and symbols — Part 2: Applied statistics*

ISO 5725-1, *Accuracy (trueness and precision) of measurement methods and results — Part 1: General principles and definitions*

ISO 5725-2, *Accuracy (trueness and precision) of measurement methods and results — Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method*

ISO Guide 30, *Reference materials — Selected terms and definitions*

koniec náhľadu – text ďalej pokračuje v platenej verzii STN