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STANDARD

5725-6

First edition
1994-12-15

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

Part 6:

Use in practice of accuracy values

*Exactitude (justesse et fidélité) des résultats et méthodes de mesure —
Partie 6: Utilisation dans la pratique des valeurs d'exactitude*



Reference number
ISO 5725-6:1994(E)

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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.

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.

International Standard ISO 5725-6 was prepared by Technical Committee ISO/TC 69, *Applications of statistical methods*, Subcommittee SC 6, *Measurement methods and results*.

ISO 5725 consists of the following parts, under the general title *Accuracy (trueness and precision) of measurement methods and results*:

- *Part 1: General principles and definitions*
- *Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method*
- *Part 3: Intermediate measures of the precision of a standard measurement method*
- *Part 4: Basic methods for the determination of the trueness of a standard measurement method*
- *Part 5: Alternative methods for the determination of the precision of a standard measurement method*
- *Part 6: Use in practice of accuracy values*

Parts 1 to 6 of ISO 5725 together cancel and replace ISO 5725:1986, which has been extended to cover trueness (in addition to precision) and intermediate precision conditions (in addition to repeatability and reproducibility conditions).

Annex A forms an integral part of this part of ISO 5725.

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Introduction

0.1 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 arithmetic mean of a large number of test results and the true or accepted reference value. "Precision" refers to the closeness of agreement between test results.

0.2 The need to consider "precision" arises because tests performed on presumably identical materials in presumably identical circumstances do not, in general, yield identical results. This is attributed to unavoidable random errors inherent in every measurement procedure; the factors that influence the outcome of a measurement cannot all be completely controlled. In the practical interpretation of measurement data, this variability has to be taken into account. For instance, the difference between a test result and some specified value may be within the scope of unavoidable random errors, in which case a real deviation from such a specified value has not been established. Similarly, comparing test results from two batches of material will not indicate a fundamental quality difference if the difference between them can be attributed to the inherent variation in the measurement procedure.

0.3 Parts 1 to 5 of ISO 5725 discuss the background to, and given methods for, the assessment of the precision (in terms of the repeatability standard deviation and the reproducibility standard deviation) and the trueness (in terms of the various components of bias) of measurements produced by a standard measurement method. Such assessment would, however, be pointless if there were no practical uses to which the results could be put.

0.4 Given that the accuracy of a measurement method has been established, this part of ISO 5725 applies that knowledge in practical situations in such a way as to facilitate commercial transactions and to monitor and improve the operational performance of laboratories.

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

Part 6:

Use in practice of accuracy values

1 Scope

1.1 The purpose of this part of ISO 5725 is to give some indications of the way in which accuracy data can be used in various practical situations by:

- a) giving a standard method of calculating the repeatability limit, the reproducibility limit and other limits to be used in examining the test results obtained by a standard measurement method;
- b) providing a way of checking the acceptability of test results obtained under repeatability or reproducibility conditions;
- c) describing how to assess the stability of results within a laboratory over a period of time, and thus providing a method of "quality control" of the operations within that laboratory;
- d) describing how to assess whether a given laboratory is able to use a given standard measurement method in a satisfactory way;
- e) describing how to compare alternative measurement methods.

1.2 This part of ISO 5725 is concerned exclusively with measurement methods which yield measurements on a continuous scale and give a single numerical figure as the result, although this single figure may be the outcome of a calculation from a set of observations.

1.3 It is assumed that the estimates of trueness and precision for the method have been obtained in accordance with parts 1 to 5 of ISO 5725.

1.4 Any additional information regarding the field of application will be given at the beginning of each particular application.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 5725. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 5725 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.