



SLOVENSKI STANDARD
SIST EN ISO 15839:2007

01-februar-2007

Kakovost vode - On-line senzorji/oprema za analizo voda - Specifikacije in preskusi delovanja (ISO 15839:2003)

Water quality - On-line sensors/analysing equipment for water - Specifications and performance tests (ISO 15839:2003)

Wasserbeschaffenheit - Online-Sensoren/Analysengeräte für Wasser - Spezifikationen und Leistungsprüfungen (ISO 15839:2003)

Qualité de l'eau - Matériel d'analyse/capteurs directs pour l'eau - Spécifications et essais de performance (ISO 15839:2003)

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Ta slovenski standard je istoveten z: EN ISO 15839:2006

ICS:

13.060.45 Preiskava vode na splošno Examination of water in general

SIST EN ISO 15839:2007

en,fr,de

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ICS 13.060.45; 13.060.01

English Version

Water quality - On-line sensors/analysing equipment for water -
Specifications and performance tests (ISO 15839:2003)

Qualité de l'eau - Matériel d'analyse/capteurs directs pour
l'eau - Spécifications et essais de performance (ISO
15839:2003)

Wasserbeschaffenheit - Online-Sensoren/Analysengeräte
für Wasser - Spezifikationen und Leistungsprüfungen (ISO
15839:2003)

This European Standard was approved by CEN on 10 August 2006.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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

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Foreword

The text of ISO 15839:2003 has been prepared by Technical Committee ISO/TC 147 "Water quality" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 15839:2006 by Technical Committee CEN/TC 230 "Water analysis", the secretariat of which is held by DIN.

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 February 2007, and conflicting national standards shall be withdrawn at the latest by February 2007.

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

Endorsement notice

The text of ISO 15839:2003 has been approved by CEN as EN ISO 15839:2006 without any modifications.

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**Water quality — On-line
sensors/analysing equipment for water —
Specifications and performance tests**

*Qualité de l'eau — Matériel d'analyse/capteurs directs pour l'eau —
Spécifications et essais de performance*

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. 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 document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 15839 was prepared by Technical Committee ISO/TC 147, *Water quality*.

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Water quality — On-line sensors/analysing equipment for water — Specifications and performance tests

WARNING — Persons using this International Standard should be familiar with normal laboratory practice. This standard does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices and to ensure compliance with any national regulatory conditions.

1 Scope

This International Standard describes the performance testing of on-line sensors/analysing equipment for water. The standard is applicable to most sensors/analysing equipment, but it is recognized that, for some sensors/analysing equipment, certain performance tests cannot be carried out. This International Standard

- defines an on-line sensor/analysing equipment for water quality measurements;
- defines terminology describing the performance characteristics of on-line sensors/analysing equipment;
- specifies the test procedures (for laboratory and field) to be used to evaluate the performance characteristics of on-line sensors/analysing equipment.

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2 Normative references

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The following referenced documents are indispensable for the application 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 5725-1:1994, *Accuracy (trueness and precision) of measurement methods and results — Part 1: General principles and definitions*

ISO 6879:1995, *Air quality — Performance characteristics and related concepts for air quality measuring methods*

ISO 8466-1:1990, *Water quality — Calibration and evaluation of analytical methods and estimation of performance characteristics — Part 1: Statistical evaluation of the linear calibration function*

ISO/TR 13530:1997, *Water quality — Guide to analytical quality control for water analysis*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

accepted reference value

value that serves as an agreed reference value for comparison, and which is derived as:

- a) an assigned or certified value based on experimental work of some national or international organization;
- b) a consensus or certified value based on collaborative experimental work;
- c) a theoretical or established value based on scientific principles;
- d) when a), b) and c) are not available, the expectation of the (measurable) quantity, i.e. the mean of a number of measurements.

[Adapted from ISO 5725-1:1994]

3.2

accuracy

closeness of agreement between a measured value and the accepted reference value

NOTE The term accuracy, when applied to a set of measured values, involves a combination of random components and a common systematic error or bias component.

[Adapted from ISO 5725-1:1994]

3.3

analytical chain

set of instruments and actions covering all the steps involved in determining a reference value in a field test, including sampling, fractioning, conditioning, storage and transportation of the sample to the laboratory for analysis

3.4

availability

(measurement chain) percentage of the full measurement period during which the measurement chain is available for making measurements

NOTE The full measurement period is the period which includes all specified automatic or manual maintenance operations at least once

cf. **up-time** (3.42)

3.5

bias

consistent deviation of the measured value from an accepted reference value

NOTE Bias is the total systematic error as contrasted to random error. There may be one or more systematic error components contributing to the bias. A larger systematic difference from the accepted reference value is reflected by a larger bias value.

[Adapted from ISO 5725-1:1994]

3.6

blank solution

solution, free of determinand, to which the on-line sensor/analysing equipment is exposed in the same way as calibration or sample solutions

NOTE The value of the measurement is known as the "blank value".

3.7**calibration solution**

solution containing a substance or mixture of substances giving a defined value of the determinand and used for calibration of the on-line sensor/analysing equipment

cf. **reference material** (3.30)

3.8**calibration procedure**

set of operations that establishes, under specified conditions, the relationship between the amount or quantity of calibrant and the response indicated by the on-line sensor/analysing equipment

3.9**coefficient of variation**

ratio of the standard deviation of the on-line sensor/analysing equipment to the mean of the working range of the equipment

[Adapted from ISO 8466-1:1990]

3.10**day-to-day repeatability**

precision under day-to-day repeatability conditions

3.11**day-to-day repeatability conditions**

conditions whereby independent test results are obtained with the same method on identical test items in the same laboratory by the same operator using the same equipment and reagents over several days

3.12**delay time**

time interval between the instant when the on-line sensor/analysing equipment is subjected to an abrupt change in determinand value and the instant when the readings pass (and remain beyond) 10 % of the difference between the initial and final value of the abrupt change

NOTE For on-line sensor/analysing equipment with a sample-handling system the delay time frequently depends on the time needed to convey the sample from the sampling point to the analyser inlet.

cf. **response time** (3.33)

3.13**determinand**

property/substance that is required to be measured and to be reflected by/present in a calibration solution

3.14**fall time**

difference between the response time and the delay time when the abrupt change in determinand value is negative

cf. **delay time** (3.12) and **response time** (3.33)

3.15**interference**

undesired output signal caused by a property(ies)/substance(s) other than the one being measured

[ASTM D 3864-96]

3.16**interferent**

component of the sample, excluding the determinand, that affects the output signal

3.17

limit of detection

LOD

lowest value, significantly greater than zero, of a determinand that can be detected

3.18

limit of quantification

LOQ

lowest value of a determinand that can be determined with an acceptable level of accuracy and precision

3.19

linearity

condition in which measurements made on calibration solutions having determinand values spanning the stated range of the on-line sensor/analysing equipment have a straight-line relationship with the calibration solution determinand values

3.20

long-term drift

slope of the regression line derived from a series of differences between reference and measurement values obtained during field testing, expressed as a percentage of the working range over a 24 h period

3.21

lowest detectable change

LDC

smallest significantly measurable difference between two measurements

3.22

period between maintenance operations

time between successive maintenance operations on the measurement chain

NOTE

The shortest period between maintenance operations will typically be of the order of a few hours (between two automatic rinse operations). The longest period between maintenance operations will typically be of the order of a few months (between services).

3.23

measurement

mean value of at least 10 consecutive readings

cf. **reading** (3.29)

3.24

measurement chain

set of instruments and actions that covers all the steps involved in measuring a determinand, including the on-line sensor/analysing equipment, sampling and pretreatment, transportation and storage of the sample

3.25

memory effect

temporary or permanent dependence of readings on one or several previous values of the determinand

[Adapted from ISO 6879:1995]

3.26

on-line sensor/analysing equipment

automatic measurement device which continuously (or at a given frequency) gives an output signal proportional to the value of one or more determinands in a solution which it measures (see Annex B)

3.27

performance characteristics

set of parameters describing the performance of the on-line sensor/analysing equipment and measurement chain