SLOVENSKI STANDARD
SIST EN ISO 5667-3:2013

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Nadomešča:
SIST EN ISO 5667-3:2004
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Kakovost vode - Vzorčenje - 3. del: Shranjevanje in ravnanje z vzorci vode (ISO 5667-3:2012)

Water quality - Sampling - Part 3: Preservation and handling of water samples (ISO 5667 -3:2012)

Wasserbeschaffenheit - Probenahme - Teil 3: Konservierung und Handhabung von Wasserproben (ISO 5667-3:2012)

Qualité de l'eau - Échantillonnage - Partie 3: Conservation et manipulation des échantillons d'eau (ISO 5667-3:2012)

Ta slovenski standard je istoveten z: **EN ISO 5667-3:2012**

ICS:

13.060.45	Preiskava vode na splošno	Examination of water in general

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EUROPEAN STANDARD

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ICS 13.060.45

Supersedes EN ISO 5667-3:2003

English Version

Water quality - Sampling - Part 3: Preservation and handling of water samples (ISO 5667-3:2012)

Qualité de l'eau - Échantillonnage - Partie 3: Conservation et manipulation des échantillons d'eau (ISO 5667-3:2012)

Wasserbeschaffenheit - Probenahme - Teil 3: Konservierung und Handhabung von Wasserproben (ISO 5667-3:2012)

This European Standard was approved by CEN on 14 November 2012.

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Foreword

This document (EN ISO 5667-3:2012) has been prepared by Technical Committee ISO/TC 147 "Water quality" in collaboration with 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of an identical text or by endorsement, at the latest by May 2013, and conflicting national standards shall be withdrawn at the latest by May 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN ISO 5667-3:2003.

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Endorsement notice

The text of ISO 5667-3:2012 has been approved by CEN as a EN ISO 5667-3:2012 without any modification.

INTERNATIONAL STANDARD

ISO 5667-3

Fourth edition
2012-11-15

Water quality — Sampling —

Part 3: Preservation and handling of water samples

Qualité de l'eau — Échantillonnage —

Partie 3: Conservation et la manipulation des échantillions d'eau

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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 5667-3 was prepared by Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 6, *Sampling (general methods)*.

This fourth edition cancels and replaces the third edition (ISO 5667-3:2003), which has been technically revised.

ISO 5667 consists of the following parts, under the general title *Water quality — Sampling*:

— *Part 1: Guidance on the design of sampling programmes and sampling techniques*

— *Part 3: Preservation and handling of water samples*

— *Part 4: Guidance on sampling from lakes, natural and man-made*

— *Part 5: Guidance on sampling of drinking water from treatment works and piped distribution systems*

— *Part 6: Guidance on sampling of rivers and streams*

— *Part 7: Guidance on sampling of water and steam in boiler plants*

— *Part 8: Guidance on the sampling of wet deposition*

— *Part 9: Guidance on sampling from marine waters*

— *Part 10: Guidance on sampling of waste waters*

— *Part 11: Guidance on sampling of groundwaters*

— *Part 12: Guidance on sampling of bottom sediments*

— *Part 13: Guidance on sampling of sludges*

— *Part 14: Guidance on quality assurance of environmental water-sampling and handling*

— *Part 15: Guidance on the preservation and handling of sludge and sediment samples*

— *Part 16: Guidance on biotesting of samples*

— *Part 17: Guidance on sampling of bulk suspended solids*

— *Part 19: Guidance on sampling of marine sediments*

— *Part 20: Guidance on the use of sampling data for decision making — Compliance with thresholds and classification systems*

— *Part 21: Guidance on sampling of drinking water distributed by tankers or means other than distribution pipes*

— *Part 22: Guidance on the design and installation of groundwater monitoring points*

— *Part 23: Guidance on passive sampling in surface waters*

Introduction

This part of ISO 5667 is intended to be used in conjunction with ISO 5667-1, which deals with the design of sampling programmes and sampling techniques.

Where possible this part of ISO 5667 has been brought into line with current standards. Where new research or validation results have provided new insights, the latest knowledge has been used.

Guidance on validation protocols can be found in ISO Guide 34.[63]

Water quality — Sampling —

Part 3: Preservation and handling of water samples

NOTICE — This part of ISO 5667 and the analytical International Standards listed in Annex A are complementary. Where no analytical International Standard is applicable, the technique(s) described in Tables A.1 to A.3 take(s) normative status.

When new or revised analytical standards are developed with storage times or preservative techniques differing from those in Tables A.1 to A.3, then the storage times or preservative techniques should be validated and presented to ISO/TC 147/SC 6/WG 3 for incorporation into the next revision of this part of ISO 5667.

1 Scope

This part of ISO 5667 establishes general requirements for sampling, preservation, handling, transport and storage of all water samples including those for biological analyses. It is not applicable to water samples intended for microbiological analyses as specified in ISO 19458, ecotoxicological assays, biological assays, and passive sampling as specified in the scope of ISO 5667-23.

This part of ISO 5667 is particularly appropriate when spot or composite samples cannot be analysed on site and have to be transported to a laboratory for analysis.

2 Normative references

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 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 5667 (all parts), *Water quality — Sampling*

ISO 19458, *Water quality — Sampling for microbiological analysis*

3 Terms and definitions

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

3.1
integrity
property that the parameter(s) of interest, information or content of the sample container has not been altered or lost in an unauthorized manner or subject to loss of representativeness

3.2
sample preservation
any procedure used to stabilize a sample in such a way that the properties under examination are maintained stable from the collection step until preparation for analysis

[ISO 11074:2005,[29] 4.4.20]

NOTE Different analytes may require several samples from the same source that are stabilized by different procedures.

3.3
sample storage
process, and the result, of keeping a sample available under predefined conditions for a (usually) specified time interval between collection and further treatment of a sample

NOTE 1 Adapted from ISO 11074:2005,[29] 4.4.22.

NOTE 2 Specified time is the maximum time interval.

3.4
storage time
period of time between filling of the sample container and further treatment of the sample in the laboratory, if stored under predefined conditions

NOTE 1 Sampling finishes as soon as the sample container has been filled with the sample. Storage time ends when the sample is taken by the analyst to start sample preparation prior to analysis.

NOTE 2 Further treatment is, for most analytes, a solvent extraction or acid destruction. The initial steps of sample preparation can be steps complementary to the storage conditions for the maintenance of analyte concentrations.

4 Sampling and chain of custody

If there is a need to take samples, this is done according to a sampling programme. The first step is to design a sampling programme. Guidance on this topic is given in ISO 5667-1.

Depending on the sample type and matrix, the guidelines found in the relevant part(s) of ISO 5667 and ISO 19458 shall be consulted.

The process of preservation and handling of water samples consists of several steps. During this process, the responsibility for the samples might change. To ensure the integrity of the samples, all steps involving the sample shall be documented.

All preparation procedures shall be checked to ensure positive or negative interferences do not occur. As a minimum, this shall include the analysis of blanks (e.g. field blank or sample container) or samples containing known levels of relevant analytes as specified in ISO 5667-14.

5 Reagents and materials

WARNING — Certain preservatives (e.g. acids, alkalis, formaldehyde) need to be used with caution. Sampling personnel should be warned of potential dangers, and appropriate safety procedures should be followed.

The following reagents are used for the sample preservation and shall only be prepared according to individual sampling requirements. All reagents used shall be of at least analytical reagent grade and water shall be of at least ISO 3696, grade 2. Acids referred to in this part of ISO 5667 are commercially available "concentrated" acids.

All reagents shall be labelled with a "shelf-life". The shelf-life represents the period for which the reagent is suitable for use, if stored correctly. This shelf-life shall not be exceeded. Any reagents that are not completely used by the expiry of the shelf-life date shall be discarded.

NOTE Often the shelf-life of reagents is supplied by the receiving laboratory.

Check reagents periodically, e.g. by field blanks, and discard any reagent found to be unsuitable.

Between on-site visits, reagents shall be stored separately from sample containers and other equipment in a clean, secure cabinet in order to prevent contamination.

Each sample shall be labelled accordingly, after the addition of the preservative. Otherwise, there could be no visible indication as to which samples have been preserved, and which have not.

5.1 Solids

5.1.1 Sodium thiosulfate pentahydrate, $Na_2S_2O_3 \cdot 5H_2O$, $w(Na_2S_2O_3 \cdot 5H_2O) > 99$ %.

5.1.2 Ascorbic acid, $C_6H_8O_6$, $w(C_6H_8O_6) > 99$ %.

5.1.3 Sodium hydroxide, NaOH, $w(NaOH) > 99$ %.

5.1.4 Sodium tetraborate decahydrate, $Na_2B_4O_7 \cdot 10H_2O$, $w(Na_2B_4O_7 \cdot 10H_2O)$, > 99 %.

CAUTION Sodium tetraborate decahydrate is known to be a carcinogen, mutagen and reproductive toxin (CMR).

5.1.5 Hexamethylenetetramine (hexamine, urotropine), $C_6H_{12}N_4$, $w(C_6H_{12}N_4) > 99$ %.

5.1.6 Potassium iodide, KI, $w(KI) > 99$ %.

5.1.7 Iodine, I_2, $w(I_2) > 99$ %.

5.1.8 Sodium acetate, $C_2H_3NaO_2$, $w(C_2H_3NaO_2) > 99$ %.

5.1.9 Ethylenediamine, $C_2H_8N_2$, $w(C_2H_8N_2) > 99$ %.

5.2 Solutions

5.2.1 Zinc acetate solution $C_4H_6O_4Zn$ (10 g/l).

Dissolve 10,0 g of zinc acetate in ~100 ml of water . Dilute to 100 ml with water. Store the solution in a polypropylene or glass bottle for a maximum period of 1 a.

5.2.2 Orthophosphoric acid ($\rho \approx 1{,}7$ g/ml), H_3PO_4, $w(H_3PO_4) > 85$ %, $c(H_3PO_4) = 15$ mol/l.

5.2.3 Hydrochloric acid ($\rho \approx 1{,}2$ g/ml), HCl, $w(HCl) > 36$ %, $c(HCl) = 12{,}0$ mol/l.

5.2.4 Nitric acid ($\rho \approx 1{,}42$ g/ml), HNO_3, $w(HNO_3) > 65$ %, $c(HNO_3) = 15{,}8$ mol/l.

5.2.5 Sulfuric acid ($\rho \approx 1{,}84$ g/ml), H_2SO_4 (freshly prepared).

Dilute concentrated sulfuric acid (H_2SO_4), $\rho \approx 1{,}84$ g/ml, $w(H_2SO_4) \approx 98$ % 1 + 1 by carefully adding the concentrated acid to an equal volume of water and mix.

WARNING — Adding the concentrated acid to the water can give violent reactions because of an exothermic reaction.

5.2.6 Sodium hydroxide solution ($\rho \approx 0{,}40$ g/ml), NaOH.

5.2.7 Formaldehyde solution (formalin), CH_2O, $\phi(CH_2O) = 37$ % to 40 % (freshly prepared),

WARNING — Beware of formaldehyde vapours. Do not store large numbers of samples in small work areas.