



**SLOVENSKI STANDARD**  
**SIST EN ISO 5667-3:1996**

**01-september-1996**

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**Kakovost vode - Vzorčenje - 3. del: Navodilo za hranjenje in ravnanje z vzorci (ISO 5667-3:1994)**

Water quality - Sampling - Part 3: Guidance on the preservation and handling of samples (ISO 5667-3:1994)

Wasserbeschaffenheit - Probenahme - Teil 3: Anleitung zur Konservierung und Handhabung von Proben (ISO 5667-3:1994)

Qualité de l'eau - Echantillonnage - Partie 3: Guide général pour la conservation et la manipulation des échantillons (ISO 5667-3:1994)

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**Ta slovenski standard je istoveten z: EN ISO 5667-3:1995**

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**ICS:**

13.060.45	Preiskava vode na splošno	Examination of water in general
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**SIST EN ISO 5667-3:1996**

**en**

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EUROPEAN STANDARD

EN ISO 5667-3

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 1995

ICS 13.060.40

Descriptors: See ISO document

English version

**Water quality - Sampling - Part 3: Guidance on the  
preservation and handling of samples  
(ISO 5667-3:1994)**

Qualité de l'eau - Echantillonnage - Partie 3:  
Guide général pour la conservation et la  
manipulation des échantillons (ISO 5667-3:1994)

Wasserbeschaffenheit - Probenahme - Teil 3:  
Anleitung zur Konservierung und Handhabung von  
Proben (ISO 5667-3:1994)

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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.

The European Standards exist 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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## CEN

European Committee for Standardization  
Comité Européen de Normalisation  
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Ref. No. EN ISO 5667-3:1995 E

## Foreword

The text of the International Standard from ISO/TC 147 "Water quality" of the International Organization for Standardization (ISO) has been taken over as a European Standard by the Technical Committee CEN/TC 230 "Water analysis".

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 June 1996, and conflicting national standards shall be withdrawn at the latest by June 1996.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom.

## Endorsement notice

The text of the International Standard ISO 5667-3:1994 has been approved by CEN as a European Standard without any modification.

NOTE: Normative references to international publications are listed in annex ZA (normative).

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**Annex ZA (normative)****Normative references to international publications  
with their relevant European publications**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN</u>	<u>Year</u>
ISO 5667-1	1980	Water quality - Sampling - Part 1: Guidance on the design of sampling programmes	EN 25667-1	1993
ISO 5667-2	1991	Water quality - Sampling - Part 2: Guidance on sampling techniques	EN 25667-2	1993

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# INTERNATIONAL STANDARD

**ISO**  
**5667-3**

Second edition  
1994-08-01

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## Water quality — Sampling —

### Part 3:

Guidance on the preservation and handling of  
samples

iTeh STANDARD PREVIEW  
(standards.iteh.ai)

*Qualité de l'eau — Échantillonnage —*

*Partie 3: Guide général pour la conservation et la manipulation des  
échantillons*

<https://standards.iteh.ai/catalog/standards/sist/2098c938-ac60-4473-850c-4d0c40d2a550/sist-en-iso-5667-3-1996>



Reference number  
ISO 5667-3:1994(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.

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

This second edition cancels and replaces the first edition (ISO 5667-3:1985), of which it constitutes a technical revision.

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

- *Part 1: Guidance on the design of sampling programmes*
- *Part 2: Guidance on sampling techniques*
- *Part 3: Guidance on the preservation and handling of samples*
- *Part 4: Guidance on sampling from lakes, natural and man-made*
- *Part 5: Guidance on sampling of drinking water and water used for food and beverage processing*
- *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*

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- *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 sewage, waterworks and related sludges*

Annex A of this part of ISO 5667 is for information only.

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## Introduction

This part of ISO 5667 is intended to be used in conjunction with ISO 5667-1 and ISO 5667-2 which deal respectively with the design of sampling programmes and sampling techniques.

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# Water quality — Sampling —

## Part 3:

## Guidance on the preservation and handling of samples

### 1 Scope

This part of ISO 5667 gives general guidelines on the precautions to be taken to preserve and transport water samples.

These guidelines are particularly appropriate when a sample (spot or composite sample) cannot be analysed on site and has to be transported in order to be analysed in the laboratory.

### 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 5667. 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 5667 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.

ISO 5667-1:1980, *Water quality — Sampling — Part 1: Guidance on the design of sampling programmes.*

ISO 5667-2:1991, *Water quality — Sampling — Part 2: Guidance on sampling techniques.*

ISO 5667-8:1993, *Water quality — Sampling — Part 8: Guidance on the sampling of wet deposition.*

### 3 Preservation of samples

#### 3.1 General considerations

Waters, particularly surface waters and above all waste waters, are susceptible to being changed to differing extents as a result of physical, chemical or biological reactions which may take place between the time of sampling and the analysis. The nature and rate of these reactions are often such that, if the necessary precautions are not taken before and during transport as well as during the time in which the samples are preserved in the laboratory before being analysed, the concentrations determined will be different from those existing at the time of sampling.

It should be stressed that, particularly if there is any doubt, the analyst and the scientist interpreting the results should be consulted before deciding on the precise method of handling and preservation.

The causes of variations are numerous; some of these are as follows:

- Bacteria, algae and other organisms can consume certain constituents present in the samples; they can also modify the nature of the constituents to produce new constituents. This biological activity affects for example the contents of dissolved oxygen, carbon dioxide, nitrogen compounds, phosphorus and sometimes silicon.
- Certain compounds can be oxidized by the dissolved oxygen contained in the samples or by atmospheric oxygen [for example organic compounds, iron(II), sulfides].

- Certain substances can precipitate out [for example calcium carbonate, metals and metallic compounds such as  $\text{Al}(\text{OH})_3$ ,  $\text{Mg}_3(\text{PO}_4)_2$ ] or be lost to the vapour phase (for example oxygen, cyanides, mercury).
- The pH, conductivity, carbon dioxide content, etc. can be modified by the absorption of carbon dioxide from the air.
- Metals dissolved or in a colloidal state as well as certain organic compounds can be adsorbed or absorbed irreversibly on the surface of containers or solid materials contained in the samples.
- Polymerized products can depolymerize; conversely, simple compounds can polymerize.

The extent of these reactions is a function of the chemical and biological nature of the sample, its temperature, its exposure to light, the nature of the container in which it is placed, the time between sampling and analysis, the conditions (for example rest or agitation during transport) to which it is submitted, etc.

It follows that the variations relative to a particular constituent vary both in degree and rate, not only as a function of the type of water, but also, for the same type, as a function of seasonal conditions.

It must be emphasized moreover that these variations are often sufficiently rapid to modify the sample considerably in the space of several hours. In all cases, it is therefore essential to take the necessary precautions to minimize these reactions and, in the case of many parameters, to analyse the sample with a minimum of delay.

As the variations which take place in the water samples are due to a large extent to biological processes, it is generally necessary to choose, from the various possible methods of preservation, a method that does not introduce unacceptable contamination.

Even the time for which the preserved sample can be stored before being analysed may change.

As a guide, it can be said that methods of preservation tend to be less effective in the case of crude sewage than in the case of purified sewage (effluents from biological treatment plants). It has also been observed that the behaviour of various waste water samples during storage is different depending on whether the samples have been taken from municipal or industrial sewage-treatment plants.

On the other hand, surface waters and ground waters can in general be stored more effectively. In the case of potable waters, the problem of storage can be solved more easily because these waters are less susceptible to biological and chemical reactions.

Therefore, owing to these variations, which may affect the water samples, it may be necessary, in certain determinations, to take individual samples rather than collective samples and to analyse them immediately at the place of sampling. It should be remembered that the storage of samples for long periods is only possible for the determination of a limited number of parameters.

In spite of numerous investigations which have been carried out in order to recommend methods which will enable water samples to be stored without modification of their composition, it is impossible to give absolute rules in this context which will cover all cases and all situations and which do not have exceptions.

In every case, the method of storage should be compatible with the various analytical techniques for which it will be used. One object of this part of ISO 5667 is to describe the most commonly used techniques.

### 3.2 Feasible precautions

#### 3.2.1 Filling the container

In the case of samples for the determination of physico-chemical parameters, one simple precaution, which is not however adequate in all cases, is to fill the flasks completely and stopper them in such a way that there is no air above the sample.

This limits interaction with the gas phase and agitation during transport (thus avoiding modifications in carbon dioxide content, and hence variations in pH; hydrogen carbonates are not converted into precipitable carbonates; iron has less tendency to be oxidized, thus limiting colour variations; etc.).

For microbiological examination, the sample container should not be filled to the brim so that an air space is left after insertion of the stopper. This aids mixing before examination and avoidance of accidental contamination.

Sample containers, whose contents are frozen as part of their preservation, should not be completely filled (see 3.2.4).