

**Water quality - Sampling - Part 5:
Guidance on sampling of drinking
water and water used for food and
beverage processing**

Water quality - Sampling - Part 5: Guidance on
sampling of drinking water and water used for food
and beverage processing

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-ISO 5667-5:2002 sisaldab rahvusvahelise standardi ISO 5667-5:1991 ingliskeelset teksti. Käesolev dokument on jõustatud 03.06.2002 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes. Standard on kättesaadav Eesti standardiorganisatsioonist.	This Estonian standard EVS-ISO 5667-5:2002 consists of the English text of the international standard ISO 5667-5:1991. This document is endorsed on 03.06.2002 with the notification being published in the official publication of the Estonian national standardisation organisation. The standard is available from Estonian standardisation organisation.
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Käsitlusala: Establishes detailed principles to be applied to the design of sampling programmes, to sampling techniques and to handling and preservation of water samples. This part does not include the sampling of sources (to which applies ISO 5667).	Scope: Establishes detailed principles to be applied to the design of sampling programmes, to sampling techniques and to handling and preservation of water samples. This part does not include the sampling of sources (to which applies ISO 5667).
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INTERNATIONAL STANDARD

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Water quality — Sampling —

Part 5:

Guidance on sampling of drinking water and
water used for food and beverage processing

Qualité de l'eau — Échantillonnage —

*Partie 5: Guide pour l'échantillonnage de l'eau potable et de l'eau
utilisée dans l'industrie alimentaire et des boissons*



Reference number
ISO 5667-5:1991(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 5667-5 was prepared by Technical Committee ISO/TC 147, *Water quality*.

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*
- *Part 9: Guidance on sampling from marine waters*
- *Part 10: Guidance on sampling of wastewaters*

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- *Part 11: Guidance on sampling of groundwaters*
- *Part 12: Guidance on sampling of industrial cooling water*
- *Part 13: Guidance on sampling of sludges and sediments*

Annex A forms an integral part of this part of ISO 5667. Annex B is for information only.

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Introduction

This part of ISO 5667 is one of a group of standards dealing with the general aspects of sampling (parts 1 to 3) and the sampling of specific types of water (from part 4 onwards). It should be read in conjunction with ISO 5667-1, ISO 5667-2 and ISO 5667-3.

The general terminology used is in accordance with the various parts of ISO 6107.

Water quality — Sampling —

Part 5:

Guidance on sampling of drinking water and water used for food and beverage processing

1 Scope

This part of ISO 5667 establishes detailed principles to be applied to the design of sampling programmes, to sampling techniques and to the handling and preservation of samples of drinking water and water used for food and beverage processing (hereafter abbreviated for convenience to drinking water). It includes the processing of water in a treatment plant (including the analysis of the raw water), the supervision of the treatment plant and the distribution system, and the search for defects in the system.

This part of ISO 5667 does not include the sampling of sources such as ground water, wells and natural and man-made lakes, the water from which may be used as raw water for a treatment plant. If it is necessary to take samples at these locations, for instance to find a source of contamination of the raw water, sample according to the relevant part of ISO 5667.

Sampling is a vital part of the monitoring programme for drinking water. It is important that the sampling purpose be defined as accurately as possible and that the measurements provide the required information in the most efficient and statistically representative manner. It is worthwhile expending appreciable time and effort on the planning and design of sampling programmes; careful planning will normally be well rewarded.

Examples of sampling purposes are

- determination of the efficiency of the drinking water treatment plant or parts of it (oxidation, disinfection);

- quality monitoring of the water leaving the treatment plant;
- quality monitoring of the water in the distribution system;
- search for the cause of pollution of the distribution system (customer's complaints);
- Monitoring of the corrosive potential of drinking water in domestic plumbing;
- assessment of the effects of materials in contact with water on the water quality;
- monitoring of the influent water and the various processing stages in a food and beverage processing plant, including necessary treatment steps.

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 2859-1:1989, *Sampling procedures for inspection by attributes — Part 1: Sampling plans indexed by acceptable quality level (AQL) for lot-by-lot inspection*.

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

ISO 5667-2:1985, *Water quality — Sampling — Part 2: Guidance on sampling techniques*.

ISO 5667-3:1985, *Water quality — Sampling — Part 3: Guidance on the preservation and handling of samples*.

ISO 8199:1988, *Water quality — General guide to the enumeration of micro-organisms by culture*.

3 Sampling equipment

Reference should be made to ISO 5667-2 for sampling equipment and requirements for materials in contact with the sample, and to ISO 5667-3 for cleaning of sample containers.

4 Sampling procedure

4.1 Sampling location

Detailed guidance, including statistical consideration, is given in ISO 5667-1.

The sampling location and local safety regulations (see clause 6) influence the method of sample collection. Before collection of the sample, it should be decided whether some of the analyses are to be performed on site. On-site analysis is recommended particularly for such determinands as odour, taste, pH, chlorine, ozone, dissolved oxygen, acid (base) capacity, carbon dioxide, electrical conductivity, and for the assessment of the temperature of the water and the ambient air and the visual inspection of the sample. Cognizance should also be taken of any national regulations requiring on-site analysis.

Before transporting the sample to the laboratory, the appropriate preservation technique has to be applied; reference should be made to the guidance given in ISO 5667-3 and the relevant analytical International Standards.

4.1.1 Service reservoir

Samples should be collected from the inlet and outlet pipes, as close as possible to the service reservoir. Generally, 2 min or 3 min of free flow should be allowed to flush out any stale water within the sampling line before taking a sample. If this is insufficient, calculate the volume of water that needs to be displaced from the pipe, estimate the flushing time required at an appropriate flushing rate, and then apply a flushing time of five times that value. Alternatively, when the reservoir is below ground,

monitoring of the water temperature from the flushing may be useful in indicating when water from the reservoir is being withdrawn.

Sometimes, for example when a reservoir has been out of service or cleaned, or when there is no sampling valve on the outlet pipe, it may be necessary to take dip samples from service reservoirs, although this means of sampling should be avoided wherever possible. If it is essential to take dip samples, special care should be taken to ensure that the sampling operation does not introduce debris into the water and that equipment is sterilized before sampling, to avoid contamination of the water in the reservoir.

4.1.2 Water treatment plant

Samples should be collected from the inlet and outlet pipes as close as possible to the treatment plant. For monitoring of the different stages of water treatment, sampling should take place before and after the respective stage being monitored, for example sedimentation and filtration. If there is a disinfection and/or an oxidation plant, refer to 4.1.3.

For monitoring of water treatment plants continuous time-proportional sampling and continuous analysis (e.g. for pH value, turbidity, oxygen content) are often used. The sampling equipment should be used according to the manufacturer's instructions; reference should also be made to ISO 5667-2 for further guidance.

4.1.3 Disinfection plant

Samples from the influent to the disinfection/oxidation plant should be collected as close as possible to the plant. Samples of the effluent should be collected after allowing for the appropriate contact period between water and disinfectant/oxidant. In some installations this contact period may depend upon utilization of part of the distribution systems (however, this is prohibited in some countries). In these situations samples taken to test the efficiency of the disinfection/oxidation stage should be taken at an appropriate point within the distribution system; alternatively, a sample line with an appropriate residence time may be used for sampling within the treatment plant, although this is not generally recommended.

4.1.4 Distribution system

Samples should be collected at different locations in the distribution system and in particular from the ends of distribution systems, for example from pre-determined sampling taps or hydrants, which are located before any further treatment stages. Sam-

1) To be published. (Revision of ISO 5667-2:1982)