
Water quality — Sampling —

Part 6:

**Guidance on sampling of rivers and
streams**

*Qualité de l'eau — Échantillonnage —
Partie 6: Lignes directrices pour l'échantillonnage des rivières et des
cours d'eau*

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 5667-6:2005

<https://standards.iteh.ai/catalog/standards/sist/88e1523d-2890-46e2-a36d-de6b836a0419/iso-5667-6-2005>



PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 5667-6:2005

<https://standards.iteh.ai/catalog/standards/sist/88e1523d-2890-46e2-a36d-de6b836a0419/iso-5667-6-2005>

© ISO 2005

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword.....	v
Introduction	vii
1 Scope	1
2 Normative references	1
3 Terms and definitions.....	1
4 Design of sampling programme.....	3
4.1 Sampling point selection	3
4.2 Frequency and time of sampling.....	5
5 Preparation for sampling	6
6 Sampling at specific locations	7
6.1 Sampling from bridges.....	7
6.2 In-stream sampling	7
6.3 Sampling from the bank side.....	7
6.4 Sampling from craft.....	7
6.5 Sampling under ice.....	7
7 Sampling methods.....	7
7.1 Single, discrete samples.....	7
7.2 Sampling from specific depths	8
8 Sampling equipment.....	8
8.1 Single, discrete samples.....	8
8.2 Sampling of surface layers for LNAPL (e.g. oils) or surface films	9
8.3 Devices for sampling from specific depths	9
8.4 Automatic sampling devices	9
8.5 Other sampling equipment	10
8.6 Provision of storage for sampling equipment and of samples prior to delivery to the analysing laboratory.....	10
9 Taking the sample.....	10
9.1 Arrival on site	10
9.2 Rinsing the equipment	10
9.3 Direct sampling	11
9.4 Indirect sampling using a sampling vessel	11
9.5 Sampling through ice	11
9.6 Sampling of surface layers or films.....	11
9.7 Sampling by increments	12
9.8 Adding preservatives in the field	12
9.9 Labelling	12
10 Stabilization, transport and storage of samples	12
10.1 Stabilization.....	12
10.2 Transportation.....	12
10.3 Security and traceability of samples during storage and delivery.....	13
11 Quality.....	13
11.1 Avoidance of contamination.....	13
11.2 Sample identification and records	14
12 Reports	14
12.1 Analytical reports.....	14
12.2 Sampling protocols	15

13	Certification/registration/accreditation.....	15
14	Quality control.....	15
15	Safety precautions	15
	Bibliography	16

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO 5667-6:2005](https://standards.iteh.ai/catalog/standards/sist/88e1523d-2890-46e2-a36d-de6b836a0419/iso-5667-6-2005)

<https://standards.iteh.ai/catalog/standards/sist/88e1523d-2890-46e2-a36d-de6b836a0419/iso-5667-6-2005>

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 5667-6 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 5667-6:1990), which has been technically revised.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

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

- *Part 1: Guidance on the design of sampling programmes*¹⁾
- *Part 2: Guidance on sampling techniques*¹⁾
- *Part 3: Guidance on the 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 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 waste waters*
- *Part 11: Guidance on sampling of groundwaters*
- *Part 12: Guidance on sampling of bottom sediments*

1) ISO 5667-1 and ISO 5667-2 are currently undergoing joint revision, which will be published as ISO 5667-1.

- *Part 13: Guidance on sampling of sludges from sewage and water-treatment works*
- *Part 14: Guidance on quality assurance of environmental water sampling and handling*
- *Part 15: Guidance on preservation and handling of sludge and sediment samples*
- *Part 16: Guidance on biotesting of samples*
- *Part 17: Guidance on sampling of suspended sediments*
- *Part 18: Guidance on sampling of groundwater at contaminated sites*
- *Part 19: Guidance on sampling of marine sediments*

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[ISO 5667-6:2005](https://standards.iteh.ai/catalog/standards/sist/88e1523d-2890-46e2-a36d-de6b836a0419/iso-5667-6-2005)

<https://standards.iteh.ai/catalog/standards/sist/88e1523d-2890-46e2-a36d-de6b836a0419/iso-5667-6-2005>

Introduction

An understanding of the purpose of sampling is an essential prerequisite to identifying the principles to be applied to a particular sampling problem. Examples of the purposes of sampling programmes commonly devised for rivers and streams are as follows:

- a) to determine the suitability of the water quality of a river or stream within a river basin for a particular use, such as:
 - 1) a source of drinking water,
 - 2) for agricultural use (e.g. all types of irrigation, live-stock watering),
 - 3) for the maintenance and/or development of fisheries,
 - 4) for amenity use (e.g. aquatic sports and swimming);
- b) to assess the impact of human activities on the quality of water, such as:
 - 1) to study the effects of waste discharge or accidental spillages on a receiving water,
 - 2) to assess the impact of land use on river or stream quality,
 - 3) to assess the effect of the accumulation and release of substances including contaminants from bottom deposits on aquatic biota within the water mass, or on bottom deposits,
 - 4) to study the effects of abstraction, river regulation and river-to-river water transfers on the chemical quality of rivers and their aquatic biota,
 - 5) to study the effects of river engineering works on water quality (e.g. addition/removal of weirs, changes to channel/bed structure).

iTeh STANDARD PREVIEW
(standards.iteh.ai)

ISO 5667-6:2005

<https://standards.iteh.ai/catalog/standards/sist/88e1523d-2890-46e2-a36d-de6b836a0419/iso-5667-6-2005>

Water quality — Sampling —

Part 6: Guidance on sampling of rivers and streams

1 Scope

This part of ISO 5667 sets out the principles to be applied to the design of sampling programmes, sampling techniques and the handling of water samples from rivers and streams for physical and chemical assessment.

It is not applicable to the sampling of estuarine or coastal waters and has limited applicability to microbiological sampling.

NOTE Procedures for microbiological sampling are given in ISO 19458.

This part of ISO 5667 is not applicable to the examination of sediment, suspended solids or biota.

In cases where naturally occurring or artificially constructed dams result in the retention or storage of water for several days or more, it might be better to consider the stretch of the river or stream as a standing water body for sampling purposes. ISO 5667-4 provides guidance for sampling in these circumstances.

WARNING — The focus of this part of ISO 5667 is the collection and integrity of water samples. The collection of these samples can be hazardous and attention is therefore drawn to the existence in some countries of legislative requirements for the safety of personnel.

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 5667-18:2001, *Water quality — Sampling — Part 18: Guidance on sampling of groundwater at contaminated sites*

ISO 6107-2:1997, *Water quality — Vocabulary — Part 2*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 5667-18 and ISO 6107-2 and the following apply.

3.1 automatic sampling

process whereby samples are taken either discretely or continuously, independently of human intervention, and according to a predetermined programme

[ISO 6107-2:1997]

**3.2
incremental sampling**

technique in which small samples are taken because of a low flow rate (with the possibility of contamination by bottom deposits) or because of restricted access (e.g. where a sample is obtained through a small aperture), these small samples then being aggregated to form a composite sample

NOTE All the liquid contained in the small samples is used, unlike blending of aliquots used to make a flow-proportional sample (see 8.4).

**3.3
isokinetic sampling**

technique in which the sample from a water stream passes into the orifice of a sampling probe with a velocity equal to that of the stream in the immediate vicinity of the probe

[ISO 6107-2:1997]

**3.4
light non-aqueous-phase liquid
LNAPL**

organic compounds which have low water solubility and a density less than that of water, e.g. petroleum products

[ISO 5667-18:2001]

**3.5
random sampling**

form of sampling whereby the chances of obtaining different concentration values of a determinand are precisely those defined by the probability distribution of the determinand in question

**3.6
river**

natural body of water flowing continuously or intermittently along a well-defined course into an ocean, sea, lake, inland depression, marsh or other watercourse

[ISO 6107-2:1997]

**3.7
sampling site**

general area within a body of water from which samples are taken

[ISO 6107-2:1997]

**3.8
sampling point**

precise position within a sampling location from which samples are taken

[ISO 6107-2:1997]

**3.9
stream**

water flowing continuously or intermittently along a well-defined course, as for a river, but generally on a smaller scale

[ISO 6107-2:1997]

**3.10
sub-sample**

portion removed from a sample and intended to be representative of that sample

3.11**systematic sampling**

sampling whereby the samples are taken at predetermined intervals, often equally spaced in time

4 Design of sampling programme**4.1 Sampling point selection****4.1.1 General**

The following factors are usually considered in advance of the sampling event. Practical sampling issues, such as accessibility, may make the ideal sampling point impractical. Any change to the designated sampling point on any grounds should be discussed and agreed with the sampling programme originator. The outcome of the deliberations may be recorded in a sampling point file which contains directions to the sampling site, the detailed location of the sampling point, the method of sampling and specific details (e.g. keys required and health and safety issues). It may differentiate between equivalent sampling points that may be used if, for instance, river conditions change. It may also specify the type of sampling to be carried out, e.g. the depth to sample.

4.1.2 Choice of sampling site

In choosing the exact point from which samples are required, two aspects are generally involved:

- a) the selection of the sampling site (i.e. the location of the sampling cross-section within the river basin, river or stream);
- b) the identification of the precise point at the sampling site.

The purpose of sampling often defines sampling sites (as in the case of the determination of the quality of an effluent discharge), but sometimes the purpose only leads to a general idea of the sampling site, as in the characterization of quality in a river basin.

The choice of sampling sites for single sampling stations is usually relatively easy. For example, a monitoring station for a baseline record of water quality can be chosen to permit the use of a convenient bridge, or to allow an upstream effluent discharge or tributary to be well mixed laterally before the station. Stations for monitoring water supply abstraction points might need to be fixed within narrow limits (i.e. in proximity to the abstractions).

In regions that receive seasonal rainfall only, and that have long periods without rain, river volumes and flows can vary tremendously, and sampling sites for regular use should be chosen so as to ensure that they remain appropriate and practical for sampling during periods of both maximum and minimum flow.

Where it is necessary to carry out sampling through ice in winter, the chosen sampling site should be as close as possible to the sampling site used during other seasons of the year. If sampling is to be carried out near a bridge, the site should be located far enough upstream to avoid contamination from road salt and sand. Deviations from the routine sampling point should be detailed as part of the dataset and recorded with the analytical results.

4.1.3 Importance of mixing

When the effects of a tributary, or an effluent, on the quality in a particular identified stretch of river or the main stream are of interest, at least two sampling sites should be chosen; one should be just upstream of the confluence and the other should be sufficiently far downstream to ensure that mixing is complete.

The physical characteristics of the channels of watercourses largely control distances required for the complete mixing of effluents with stream flow.