
Water quality — Sampling —

Part 17:

**Guidance on sampling of suspended
sediments**

Qualité de l'eau — Échantillonnage —

*Partie 17: Lignes directrices pour l'échantillonnage des sédiments en
suspension*



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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 3.

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 part of ISO 5667 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 5667-17 was prepared by Technical Committee ISO/TC 147, *Water quality*, Subcommittee SC 6, *Sampling (general methods)*.

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 waste waters*
- *Part 11: Guidance on sampling of groundwaters*
- *Part 12: Guidance on sampling of bottom sediments*
- *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*

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

Introduction

This part of ISO 5667 reflects the important role of suspended solids in flowing water, especially of the silt + clay ($< 63 \mu\text{m}$) component and associated carbon, as a transport medium for nutrients (especially phosphorus), trace metals, and certain classes of organic compounds (see A.1).

Although analysis of suspended solids has been carried out for many years, there are no standard methods for field sampling of suspended solids for water quality purposes. While standard methods exist for sampling of suspended mineral sediment for sedimentological purposes these are often not appropriate for the chemical analysis of suspended solids. Because of the lack of standards for sampling of suspended solids for water quality purposes and the improbability of achieving complete standardization because of differences in the objectives of water quality programmes and the lack of standard apparatus, this part of ISO 5667 provides guidance to the various sampling procedures, their biases, and alternatives. This part of ISO 5667 excludes sampling protocols that apply to conventional water sampling. Field and laboratory filtration procedures that are conventionally used to measure the quantity of suspended solids are also excluded. Any reference to these methods is solely for the purpose of demonstrating their profound limitations for sediment quality purposes.

The objectives of a water quality programme will dictate the size of sample required and, therefore, the type of apparatus to be used. Generally, however, the analysis of physical, chemical, biological and toxicological properties may require gram-size samples. Examples of programme objectives that require bulk collection of suspended solids include:

- a) ambient monitoring for water quality assessment, control or regulation;
- b) in-river monitoring of effluents for regulatory or control purposes, especially for chemical and toxicological properties;
- c) research into water quality, including physico-chemical processes that affect the pathways, fate and effects of suspended solids and their associated nutrient and contaminant chemistry;
- d) recovery of suspended solids for purposes of physical analysis, including particle size, organic content including particulate organic carbon, sediment geochemistry, inorganic and organic chemistry of suspended solids, and toxicity of suspended solids.

Water quality — Sampling —

Part 17:

Guidance on sampling of suspended sediments

1 Scope

This part of ISO 5667 is applicable to the sampling of suspended solids for the purpose of monitoring and investigating freshwater quality, and more particularly to flowing freshwater systems such as rivers and streams. Certain elements of this part of ISO 5667 may be applied to freshwater lakes, reservoirs and impoundments, however field sampling programmes may differ and are not necessarily covered here.

2 Terms and definitions

For the purposes of this part of ISO 5667, the following terms and definitions apply.

2.1

suspended solids

solids removed by filtration or centrifuging under specified conditions

[ISO 6107-2]

2.2

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]

3 Sampling equipment

3.1 General

There are a number of different sampling techniques with differing apparatus for the bulk collection of suspended solids. Many of these samplers are specific to site conditions and may require deployment from boats, bridges or by wading.

3.2 Passive samplers

This class of samplers includes the conventional suspended solids samplers such as depth integrating and point samplers. Passive samplers are placed in the water column where they fill under ambient conditions using isokinetic sampling methods. These samplers are generally used in conjunction with standard sampling protocols for the collection of the most representative mineral solids sample in a given riverine cross-section, such as the equal discharge increment and equal width increment methods [9], [10], [11].

The majority of standard samplers described by the National Handbook of Recommended Methods for Water-Data Acquisition [11] were developed for quantity and not quality determinations of suspended solids. Their use is not recommended for solids quality sampling, due to small sample volumes, contamination of the sample by the materials used in the construction of these samplers, and other technical and methodological factors [16].