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Water quality — Sampling —

Part 10:
Guidance on sampling of waste waters

Qualité de l'eau — Échantillonnage —
Partie 10: Guide pour l'échantillonnage des eaux résiduaires

Reference number
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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.

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 5667-10 was prepared by Technical Committee ISO/TC 147, *Water quality*, Sub-Committee 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*

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

— *Part 11: Guidance on sampling of groundwaters*

— *Part 12: Guidance on sampling of sediments*

Annex A forms an integral part of this part of ISO 5667.

Introduction

This part of ISO 5667 is one of a group of standards dealing with the sampling of specific types of water. 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, particularly ISO 6107-2.

Water quality — Sampling —

Part 10:
Guidance on sampling of waste waters

1 Scope

This part of ISO 5667 contains details on the sampling of domestic and industrial waste water, i.e. the design of sampling programmes and techniques for the collection of samples. It covers waste water in all its forms, i.e. industrial waste water, and crude and treated domestic waste water.

Sampling of accidental spillages is not included, although the methods described in certain cases may also be applicable to spillages.

1.1 Objectives

A sampling programme may be based on many different objectives. Some of the more common objectives are:

— to determine the concentration of pollutants in a waste-water stream;

— to determine the load of pollutants carried by a waste-water stream;

— to provide data for the operation of a waste-water treatment plant;

— to test whether given discharge concentration limits are kept;

— to test whether given discharge load limits are kept;

— to provide data for the levy upon discharge of waste water.

When designing a waste-water sampling programme, it is essential for the objective of the study to be kept in mind, so that the information gained from the study corresponds closely to the information required.

Generally, the objectives of sampling are quality control or quality characterization, as described in 1.1.1 and 1.1.2.

1.1.1 Quality characterization

Quality characterization aims at determining the concentration or load of pollutants in a waste-water stream, generally during an extended period of time, for example, to monitor compliance with a standard, to determine trends, to provide data on unit process efficiency or to provide loading data for planning and/or design purposes.

1.1.2 Quality control

The objective of quality control may be one of the following:

a) to provide data for either short-term or long-term control of waste-water treatment plant operation (e.g. control of biomass growth in activated sludge units, control of anaerobic digestion processes, control of industrial effluent treatment plants);

b) to provide data for waste-water treatment plant protection (e.g. to provide domestic waste-water plants with protection against deleterious effects from industrial effluents, to identify the sources of undesirable industrial effluent residues);

c) to provide data for pollution control (e.g. controlling disposal operations to land, sea or water courses).

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 2602:1980, *Statistical interpretation of test results — Estimation of the mean — Confidence interval.*

ISO 2854:1976, *Statistical interpretation of data — Techniques of estimation and tests relating to means and variances.*

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

ISO 5667-5:1991, *Water quality — Sampling — Part 5: Guidance on sampling of drinking water and water used for food and beverage processing.*

ISO 6107-2:1989, *Water quality — Vocabulary — Part 2.*

3 Definitions

For the purposes of this part of ISO 5667, the following definitions, taken from ISO 6107-2, apply.

3.1 composite sample: Two or more samples or sub-samples, mixed together in appropriate known proportions (either discretely or continuously), from which the average result of a desired characteristic may be obtained. The proportions are usually based on time or flow measurements.

3.2 sampling line: The conduit which leads from the sampling probe to the sample delivery point or the analysing equipment.

3.3 sampling point: The precise position within a sampling location from which samples are taken.

3.4 spot sample: A discrete sample taken randomly (with regard to time and/or location) from a body of water.

4 Sampling equipment

4.1 Sample containers

The laboratory responsible for analysing the samples should be consulted on the type of container that should be used for sample collection, storage and transportation.

ISO 5667-2 and ISO 5667-3 contain detailed information on the selection of sample containers.

The sample container needs to prevent losses due to adsorption, volatilization and contamination by foreign substances.

Desirable factors to be considered when selecting sample containers are

— high resistance to breakage;

— good sealing efficiency;

— ease of reopening;

— good resistance to temperature extremes;

— practicable size, shape and mass;

— good potential for cleaning and re-use;

— availability and cost.

For waste-water sampling, plastics containers are recommended for most determinands. Some exceptions exist where only glass containers should be used, when for example the following analyses are to be made:

— oil and grease;

— hydrocarbons;

— detergents;

— pesticides.

If sterilized or disinfected sewage samples are to be collected, sterile containers and sampling apparatus should be used (e.g. see ISO 5667-5).

4.2 Type of apparatus

4.2.1 Manual sampling equipment

The simplest equipment used for taking effluent samples consists of a bucket, ladle, or wide-mouthed bottle that may be mounted on a handle of a suitable length. The volume should not be less than 100 ml. When manual samples are to be used for the preparation of composite samples, the volume of the bucket, ladle or bottle should be well defined and known to a precision of within ± 5 %. Manual samples can also be taken with a Ruttner or Kemmerer sampler, consisting of a 1 litre to 3 litre volume tube with a hinged lid at each end of the tube, or other samplers operating on a similar principle.