



SLOVENSKI STANDARD
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Water quality - Sampling - Part 23: Determination of priority pollutants in surface water using passive sampling (ISO/DIS 5667-23:2009)

Wasserbeschaffenheit - Probenahme - Teil 23: Bestimmung signifikanter Schadstoffe in Oberflächengewässern mittels passiver Probenahme (ISO/DIS 5667-23:2009)

Qualité de l'eau - Échantillonnage - Partie 23: Détermination des polluants prioritaires dans les eaux de surface en utilisant un échantillonnage passif (ISO/DIS 5667-23:2009)

Ta slovenski standard je istoveten z: prEN ISO 5667-23

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13.060.45 Preiskava vode na splošno Examination of water in general

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English Version

**Water quality - Sampling - Part 23: Determination of priority
pollutants in surface water using passive sampling (ISO/DIS
5667-23:2009)**

Qualité de l'eau - Échantillonnage - Partie 23:
Détermination des polluants prioritaires dans les eaux de
surface en utilisant un échantillonnage passif (ISO/DIS
5667-23:2009)

Wasserbeschaffenheit - Probenahme - Teil 23:
Bestimmung signifikanter Schadstoffe in
Oberflächengewässern mittels passiver Probenahme
(ISO/DIS 5667-23:2009)

This draft European Standard is submitted to CEN members for parallel enquiry. It has been drawn up by the Technical Committee CEN/TC 230.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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Foreword

This document (prEN ISO 5667-23:2009) has been prepared by Technical Committee ISO/TC 147 "Water quality" in collaboration with Technical Committee CEN/TC 230 "Water analysis", the secretariat of which is held by DIN.

This document is currently submitted to the parallel Enquiry.

Endorsement notice

The text of ISO/DIS 5667-23:2009 has been approved by CEN as a prEN ISO 5667-23:2009 without any modification.

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DRAFT INTERNATIONAL STANDARD ISO/DIS 5667-23

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Water quality — Sampling —

Part 23:

Determination of priority pollutants in surface water using passive sampling

Qualité de l'eau — Échantillonnage —

Partie 23: Détermination des polluants prioritaires dans les eaux de surface en utilisant un échantillonnage passif

ICS 13.060.45

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ISO/CEN PARALLEL PROCESSING

This draft has been developed within the International Organization for Standardization (ISO), and processed under the **ISO-lead** mode of collaboration as defined in the Vienna Agreement.

This draft is hereby submitted to the ISO member bodies and to the CEN member bodies for a parallel five-month enquiry.

Should this draft be accepted, a final draft, established on the basis of comments received, will be submitted to a parallel two-month approval vote in ISO and formal vote in CEN.

In accordance with the provisions of Council Resolution 15/1993 this document is circulated in the English language only.

Conformément aux dispositions de la Résolution du Conseil 15/1993, ce document est distribué en version anglaise seulement.

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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.

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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 5667-23 was prepared by Technical Committee ISO/TC 147, *Water quality* - Subcommittee SC 6 *Sampling (general methods)* and by Technical Committee CEN/TC 230, *Water analysis* in collaboration.

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

- Part 1: *Guidance on the design of sampling programmes*
- 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 sampling of wet deposition*
- Part 9: *Guidance of sampling from marine waters*
- Part 10: *Guidance of sampling of waste waters*
- Part 11: *Guidance of sampling of groundwaters¹⁾*
- Part 12: *Guidance on sampling of bottom sediments*
- Part 13: *Guidance on sampling of sludges from sewage and water-treatment works¹⁾*
- Part 14: *Guidance on quality assurance of environmental water sampling and handling*
- Part 15: *Guidance on preservation and handling of sludge and sediment samples¹⁾*
- Part 16: *Guidance on biotesting of samples*
- Part 17: *Guidance on sampling of suspended sediments¹⁾*

1) Under revision

- Part 18: *Guidance on sampling of groundwater at contaminated sites*
- Part 19: *Guidance on sampling in marine areas*
- Part 20: *Guidance on the use of sampling data for decision making – Compliance with limits and classification systems²⁾*
- Part 21: *Guidance on sampling of drinking water distributed by non-continuous, non-conventional means²⁾*
- Part 22: *Guidance on design and installation of groundwater sample points²⁾*

Introduction

Passive sampling devices can be used for monitoring concentrations of a wide range of analytes (including metals, and inorganic anions, polar organic compounds such as polar pesticides and pharmaceutical compounds, and non-polar organic compounds such as non-polar pesticides, and industrial chemicals such as polyaromatic hydrocarbons and polychlorinated biphenyls) in aquatic environments. For more information on individual type of passive sampling devices, refer to the bibliography section - Reviews of passive sampling devices. Pollutant levels in surface water have traditionally been monitored by spot sampling (also known as bottle or grab sampling). Such sampling gives a snapshot of pollutant levels at a particular time. Pollutant levels in surface water have a tendency to fluctuate over time and so it may be more desirable to monitor pollutants over an extended time period in order to obtain a more representative measure of the chemical quality of a water body. This may be achieved by repeated spot sampling, continuous monitoring, biomonitoring or passive sampling.

Passive sampling involves the deployment of a passive sampling device that uses a diffusion gradient to collect pollutants over a period of days to weeks. This process is followed by extraction and analysis of the pollutants in a laboratory.

Passive sampling devices can be used in kinetic or equilibrium modes. In equilibrium mode the passive sampling devices provide a measure of the concentration at the time of retrieval from the environment. In kinetic mode the passive sampling device samples in an integrative way, and provides a measure of the time weighted average concentration of a pollutant in the water over the exposure period. Passive sampling devices operate as integrative samplers between the time of deployment and an exposure time of up to the time to half maximum accumulation in the receiving phase.

Diffusion into the receiving phase is driven by the free dissolved fraction of pollutant, and not that bound to particulate matter and to large molecular mass organic compounds (e.g. humic and fulvic acids), and so this technique provides a measure of the time-weighted average concentration of the free dissolved fraction of pollutant to which the passive sampling device was exposed. For some passive sampling devices for metals the concentration of analyte measured includes both the free dissolved fraction and that fraction of the analyte bound to large molecular mass organic compounds that can dissociate in the permeation layer. The fraction sampled by a passive sampling device can be different from that sampled in a spot (bottle) sample. In a spot sample the fraction of pollutant measured is determined by a combination of factors such as the proportion of pollutant bound to particulate matter and to large organic compounds, and the treatment (e.g. filtration at 0.45 µm, or ultrafiltration) applied prior to analysis. Passive sampling devices used in surface water typically consist of a receiving phase (typically a solvent or sorbent) that has a high affinity for pollutants of interest and so collects them. This receiving phase may be retained behind or surrounded by a membrane through which the target analytes can permeate. A schematic representation of such a passive sampling device is shown in Figure 1. In its simplest form a passive sampling device is comprised solely of a naked membrane, or fibre, or bulk sorbent which acts as a receiving phase, and in such passive sampling devices where a permeation membrane is absent the boundary layer of water may act as the permeation layer. Different combinations of

2) In preparation

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permeation layer and receiving phase are used for the different classes of pollutant (non-polar organic, polar organic, and inorganic, and passive sampling devices are designed for use with one of these main classes of pollutant.

Passive sampling devices can be used in a number of modes including qualitative or semi-quantitative which can be applied in for instance the detection of sources of pollution. When appropriate calibration data are available, passive sampling devices can also be used quantitatively for measuring the concentration of the free dissolved fraction of a pollutant.

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