VEE KVALITEET
Proovivõtt
Osa 9: Juhised mereveest proovide võtmiseks

Water quality
Sampling
Part 9: Guidance on sampling from marine waters
(ISO 5667-9:1992)

EESTI STANDARDIKESKUS EVS
ESTONIAN CENTRE FOR STANDARDISATION

EESTI STANDARDI EESSÕNA	NATIONAL FOREWORD
See Eesti standard EVS-ISO 5667-9:2013 „Vee kvaliteet. Proovivõtt. Osa 9: Juhised mereveest proovide võtmiseks“ sisaldab rahvusvahelise standardi ISO 5667-9:1992 „Water quality – Sampling – Part 9: Guidance on sampling from marine waters“ identset ingliskeelset teksti.	This Estonian Standard EVS-ISO 5667-9:2013 consists of the identical English text of the International Standard ISO 5667-9:1992 “Water quality – Sampling – Part 9: Guidance on sampling from marine waters“.
Ettepaneku rahvusvahelise standardi ümbertrüki meetodil ülevõtuks on esitanud Keskkonnaministeerium, standardi avaldamist on korraldanud Eesti Standardikeskus.	Proposal to adopt the International Standard by reprint method has been presented by EVS/TK 4, the Estonian standard has been published by the Estonian Centre for Standardisation.
Standard EVS-ISO 5667-9:2013 on jõustunud sellekohase teate avaldamisega EVS Teataja 2014. aasta jaanuarikuu numbris.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Käsitlusala

ISO 5667 see osa annab juhiseid põhimõtete rakendamiseks proovivõtuplaanide kavandamisel, proovivõtutoimingutel ja loeveest [näiteks estuaaridest ja tõusuvee kanalitest (*tidal inlets*), rannikupiirkondadest ning avamerest] võetud merevee proovide käsitlemisel ja säilitamisel. Seda ei rakendata proovivõtule mikrobioloogiliseks või bioloogiliseks uuringuks. Proovivõtu üldised juhised mikrobioloogilisel otstarbel on antud standardis ISO 8199.

ISO 5667 selle osa põhieesmärgid on määratud jaotistes 1.1 kuni 1.4.

1.1 Kvaliteedinäitajate mõõtmine

Kliima, bioloogilise aktiivsuse, vee liikumiste ja inimtegevuse mõju tuvastamiseks, samuti tuleviku muutuste ulatuse ja tagajärgede määramisele kaasa aitamiseks mõõdetakse vee kvaliteedi ruumilise jaotuse ja ajaliste trendide muutusi.

1.2 Kvaliteedikontrolli mõõtmine

Pikaajaline vee kvaliteedi mõõtmine ühes või mitmes määratud kohas, et kindlaks teha, kas kord iseloomustatud vee kvaliteet jääb ettenähtud kasutamisel, nagu suplemine, veeorganismide kaitsmine, demineraliseerimine või jahutusveena kasutamine, nõuetele vastavaks ning kas tuvastatud muutused on vastuvõetamatud.

1.3 Konkreetsetel põhjustel mõõtmine

Vee kvaliteedi märkimisväärsete muutuste põhjuse, ulatuse ja mõju hindamine ja merevette juhitud saasteaine allikate ja järgneva transformatsiooni uurimine. Sisselaskude, lekkimiste ja isegi planktoni vohamisega seotud reostust on võimalik tuvastada näiteks suurselgrootute põhjaloomade, kalade ja lindude suremuse või muude nähtuste, nagu värvuse ja hägususe muutused, ujuvate määrdunud laikude või õlikihi moodustumise põhjal. Siiski tuleb rõhutada seda, et sageli on seda eesmärki väga raske edukalt täita. Suremused võivad olla põhjustatud loodusnähtustest ja saasteainete koosmõju võib suures osas nähtamatuks jääda.

1.4 Inimtegevuse mõju uurimine

Inimtegevusest, nagu paisude, muulide, lainemurdjate või sadamate ehitusest, ja ulatuslikust merevee kasutamisest reostuse kõrvaldamiseks põhjustatud vee kvaliteedi muutuste hindamine.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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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 5667-9 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*

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

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— *Part 11: Guidance on sampling of groundwaters*

— *Part 12: 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.

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, which deal respectively with the design of sampling programmes, sampling techniques and on the preservation and handling of samples.

Water quality — Sampling —

Part 9:
Guidance on sampling from marine waters

1 Scope

This part of ISO 5667 provides guidance on the principles to be applied to the design of sampling programmes, sampling techniques and the handling and preservation of samples of sea water from tidal waters (for example, estuaries and tidal inlets, coastal regions and the open sea). It does not apply to the collection of samples for microbiological or biological examination. General guidance on sampling for microbiological purposes is given in ISO 8199.

The main objectives of this part of ISO 5667 are specified in 1.1 to 1.4.

1.1 Quality characterization measurement

Measurement of variations in spatial distribution and temporal trends in water quality to establish the effects of climate, biological activity, water movements and the influences of man, and also to assist in determining the magnitude and consequences of future changes.

1.2 Quality control measurement

Measurement of water quality over a long period of time at one or more defined places to establish whether water quality, once characterized, remains suitable for defined uses such as bathing, protection of aquatic life, demineralization or cooling purposes, and to establish whether observed changes are unacceptable.

1.3 Measurements for specific reasons

Assessment of the cause, magnitude and effect of significant variations in water quality and investigation of the sources and subsequent fate of pollutants discharged into marine waters. Identification of pollution, for example invertebrate, fish or bird mortality, or other conspicuous phenomena such as colour or turbidity development, or formation of floating layers of dirt or oil, which can be ascribed to discharges, spillages or even plankton blooms. However, it must be stressed that this objective is often very difficult to achieve. Mortalities may be caused by natural phenomena and cumulative pollutants may often remain largely unseen.

1.4 Examination of the effects of man-made structures

Assessment of water quality variations caused by engineering developments such as barrages, jetties, bridges, breakwaters or ports, and resulting from the extensive use of marine waters for waste disposal.

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 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 5667-4:1987, *Water quality — Sampling — Part 4: Guidance on sampling from lakes, natural and man-made.*

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

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

3 Definitions

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

3.1 spot sample: A discrete sample taken randomly (with regard to time and/or location) from a body of water. [ISO 6107-2]

3.2 depth profile samples: A series of water samples taken from various depths of a body of water at a specific location. [ISO 5667-4]

NOTE 1 In order to obtain a characterization of the water quality throughout the water body it is necessary to take depth profile samples at various locations.

3.3 area profile samples: A series of water samples taken from a particular depth of a body of water at various locations: in tidal waters, either length profiles (along the length of the channel) or cross profiles (across the length of the channel), in coastal waters and the open sea along either a one- or two-dimensional plan-view grid. [ISO 5667-4]

NOTE 2 As in 3.2, characterization may demand a three-dimensional approach to sampling.

3.4 composite samples: Two or more samples or subsamples, 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. [ISO 6107-2]

4 Sampling equipment

4.1 Sample container

General guidance is given in ISO 5667-2.

It is essential that special regard be given to the need to prevent contamination or losses through absorption of the low levels of many substances prevalent in sea water, and also to the problems which arise in relation to the high ionic strength of sea water compared to most other natural waters. Glass or other inert materials should be used if there is a risk of interaction of the sample with the container.

NOTE 3 Further details are described by Berman and Yeats (1985) [1].

When sampling at sea, fragile containers should be avoided.

4.2 Types of sampling equipment

4.2.1 Introduction

Subsurface samples can be satisfactorily collected by simple (manual) submersion of the sample container. The top can then be opened, and the container allowed to fill before recapping. It is essential for the bottle to be washed out several times with the water to be sampled before the definitive sample is collected. Plastics gloves should be worn by the operator to avoid contamination of the sample which should be taken upstream or up-tide of the sampling platform and in open water. This can be achieved by taking the sample from a point ahead of the bows of a boat as it moves slowly into the wind or current. This simple method minimizes any possible contamination and prevents possible absorptive losses on the internal surfaces of a sampling device.

The various mechanical aids developed to collect samples from different depths are described in 4.2.2 to 4.2.4.

NOTE 4 Further details are included in "Methods of Seawater Analysis" (1983) [2].

4.2.2 Open samplers and surface samplers

Open samplers are open-mouthed vessels which are used for sampling at, or immediately beneath, the water surface. Open samplers cannot usually be recommended for subsurface sampling because of contamination by the surface layer, which may contain concentrations of some compounds which are sufficiently elevated to influence the overall concentration in the bulk sample.

Samples from the surface microlayer should be taken with samplers specially designed for this purpose, but it is difficult to obtain representative samples, particularly under field conditions.

NOTE 5 The surface microlayer can only really be sampled in a qualitative manner. However, the chemistry of the microlayer and sampling methods have been extensively reviewed by Liss (1975) [3].

4.2.3 Closed-pipe devices

Closed-pipe samplers are hollow tubes fitted with valves or stoppers which are recommended for obtaining samples from defined depths (either spot