Water quality - Guidance standard for the surveying, sampling and laboratory analysis of phytobenthos in shallow running water

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NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 15708:2010 sisaldab Euroopa standardi EN 15708:2009 ingliskeelset teksti.	This Estonian standard EVS-EN 15708:2010 consists of the English text of the European standard EN 15708:2009.
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English Version

Water quality - Guidance standard for the surveying, sampling and laboratory analysis of phytobenthos in shallow running water

Qualité de l'eau - Guide pour l'étude, l'échantillonnage et l'analyse en laboratoire du phytobenthos dans les cours d'eau peu profonds

Wasserbeschaffenheit - Anleitung zur Beobachtung, Probenahme und Laboranalyse von Phytobenthos in flachen Fließgewässern

This European Standard was approved by CEN on 10 October 2009.

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COMITÉ EUROPÉEN DE NORMALISATION
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Contents

Page

Foreword

This document (EN 15708:2009) has been prepared by Technical Committee CEN/TC 230 “Water analysis”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2010, and conflicting national standards shall be withdrawn at the latest by May 2010.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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Introduction

WARNING — Working in or around water is inherently dangerous. Persons using this European Standard should be familiar with normal laboratory practice. Long periods of analysis at the microscope can cause physical fatigue and affect eyesight. Attention should be given to the ergonomics of the microscope and advice from a health and safety practitioner should be sought to ensure that risks are minimized. The use of chemical products mentioned in this standard can be hazardous and users should follow guidelines provided by the manufacturers and take necessary specialist advice. This standard does not purport to address the safety problems associated with its use. It is the responsibility of the user to establish appropriate health and safety practices and to ensure compliance with any national regulatory conditions.

The phytobenthos is an important component of aquatic ecosystems and an understanding of the composition of the phytobenthos present in a waterbody can provide useful information on the status of that waterbody, and on appropriate management strategies. The Water Framework Directive (2000/60/EC) [3] requires monitoring of the phytobenthos as a quality element used for ecological status assessment, and phytobenthos assessments have also been used in monitoring programmes associated with other European Directives (e.g. Urban Wastewater Treatment Directive, Habitats Directive) and with national legislation (e.g. ÖNORM M6231).

This guidance standard specifically relates to the sampling of phytobenthos (other than aquatic macrophytes) in running water. An etymologically-correct application of the term “phytobenthos” would cover all phototrophic organisms; however, this encompasses a vast range of organisms, from microscopic unicells to macrophytes > 2 m in length. As separate survey methods for aquatic macrophytes are available (EN 14184), this document focuses on phototrophic algae and oxygenic cyanobacteria that live on substrata. Bryophytes are common in shallow running waters and competitive interactions between these and larger algae are common. Similarly, aquatic macrophyte species may, themselves, act as substrata or competitors for algae and cyanobacteria. For these reasons, the standard provides options for including these taxa in survey and sampling procedures. The term “periphyton” is sometimes used instead of “phytobenthos”; however, some definitions of “periphyton” include heterotrophic organisms that live attached to substrata (protozoa, sponges, hydroides). Methods described here deal only with photosynthetic organisms but they could, if required, be adapated to encompass heterotrophic organisms too.

Methods using phytobenthos to assess water quality in running water have been developed in several European countries [6], [8], [9], [10] and in the USA [2]. Recent work is summarised in the proceedings of four symposia [1], [7], [11], [12]. Methods for the sampling and analysis of one group of phytobenthos, the diatoms, have already been the subject of harmonisation (EN 13946, EN 14407). However, these standards are concerned with only a single group of the phytobenthos and there are situations where other phototrophs are more obvious and can contribute additional ecological information.

According to the precise usage to which this standard is to be put it is essential for specifiers and users to mutually agree on any necessary variations or optional procedural details prior to use.

1 Scope

This European Standard provides guidelines for the survey/sampling, identification and basic quantification of phytobenthos (other than macrophytes) in running waters. It is applicable to rivers where benthic algae and bryophytes are the main phototrophs. This method encompasses all phytobenthic growth forms and enables biological responses to environmental events over one or more years to be monitored. In this respect it provides an alternative to methods based on benthic diatoms (EN 13946; EN 14407) and macrophytes (EN 14184). Data obtained for the phytobenthos growth forms are suitable for pilot surveys, water quality assessment and trend monitoring. This European Standard encompasses all aspects from the design of survey and sampling programmes to the identification and basic quantification of the phytobenthos.

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.

EN 13946, *Water quality — Guidance standard for the routine sampling and pretreatment of benthic diatoms from rivers*

EN 14407, *Water quality — Guidance standard for the identification, enumeration and interpretation of benthic diatom samples from running waters*

EN 15204, *Water quality — Guidance standard on the enumeration of phytoplankton using inverted microscopy (Utermöhl technique)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
aquatic macrophytes
larger plants of fresh water which are easily seen with the naked eye, including all aquatic vascular plants, bryophytes, stoneworts (Characeae) and macro-algal growths

[EN 14184:2003, 3.1]

3.2
assemblage
organisms that share a sampling area

NOTE This term is preferred to “community”, as the latter implies a level of ecological integration of the organisms; whereas sampling may inadvertently combine representatives from more than one true “community” that are not distinct to the naked eye.

3.3
belt transect
defined band across a river or stream at right angles to the bank

NOTE This may be virtual or physically delineated within which the aquatic vegetation is analysed (species composition, abundance, cover).

[EN 14184:2003, 3.4]