Water quality - Guidance for the routine sampling and preparation of benthic diatoms from rivers and lakes

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NATIONAL FOREWORD

See Eesti standard EVS-EN 13946:2014 sisaldab Euroopa standardi EN 13946:2014 inglisekeelset teksti.	This Estonian standard EVS-EN 13946:2014 consists of the English text of the European standard EN 13946:2014.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 12.03.2014.	Date of Availability of the European standard is 12.03.2014.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

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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Wasserbeschaffenheit - Anleitung zur Probenahme und Probenaufbereitung von benthischen Kieselalgen aus Fließgewässern und Seen

EUROPEAN COMMITTEE FOR STANDARDIZATION
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Foreword

This document (EN 13946:2014) 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of an identical text or by endorsement, at the latest by September 2014, and conflicting national standards shall be withdrawn at the latest by September 2014.

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.

This document supersedes EN 13946:2003.

This document contains the following technical changes in comparison with the previous edition:

— this European Standard is now also applicable for the sampling of benthic diatoms in lakes.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

Diatoms are an important component of aquatic ecosystems and constitute a water quality monitoring tool where the primary objective is either a measure of ecological status based on diatoms as one compartment of the ecosystem or the impact of specific components of water quality (e.g. eutrophication, acidification). The requirement for the monitoring of such processes is inherent in the Water Framework Directive (2000/60/EC) [7] and Urban Waste Water Treatment Directive (91/271/EEC) [8] in addition to other EU Directives and international agreements. This European Standard covers aspects of sampling and preparation relevant to assessment of water quality and ecological status using benthic diatoms. These sampling instructions will result in samples suitable for quantifying relative numbers of benthic diatom taxa present. If it is necessary to quantify absolute numbers of taxa, or fresh weight per unit area, modifications to the method are required, which are not within the scope of this European Standard.

The use of diatoms as indicators of river and lake quality is widely accepted both in Europe and the USA. The methodology is based on the fact that all diatom species have tolerance limits and optima with respect to their preference for environmental conditions such as nutrients, organic pollution and acidity. Polluted waters will tend to support an increased abundance of those species whose optima correspond with the levels of the pollutant in question. Conversely, certain species are intolerant of elevated levels of one or more pollutants, whilst others may occur in a wide range of water qualities.

Methods using diatoms to assess water quality have been developed in several European countries (recent work is summarized in the proceedings of three symposia [1] to [3]. The methodologies for evaluating the diatom data vary but the sampling and preparation processes are similar [5, 6].

According to the precise usage to which this European 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.

All numerical values given in this standard are approximate.

WARNING — Persons using this European Standard should be familiar with usual laboratory practice. This European Standard does not purport to address all of the safety problems, if any, 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.

1 Scope

This European Standard specifies a method for the sampling and laboratory preparation of benthic diatoms for ecological status and water quality assessments. Data produced by this method are suitable for production of water quality indices based on the relative abundance of taxa.

2 Terms and definitions

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

2.1
artificial substratum
introduced substratum
substratum introduced into river or lake by operator specifically for colonization by diatoms

2.2
benthic diatoms
diatoms living on natural or artificial substrata, rather than suspended in the water column

2.3
boulder
mineral substratum with a diameter > 256 mm

2.4
cobble
mineral substratum with a diameter > 64 mm and ≤ 256 mm

2.5
ecological status
measure of the structure and functioning of aquatic communities

2.6
euphotic zone
part of the water column in which there is sufficient light for photosynthesis

2.7
frustule
cell wall of diatoms, composed of silica and consisting of two valves linked by two or more girdle bands

2.8
habitat
specific environment in which an organism lives

2.9
pebble
mineral substratum with a diameter > 16 mm and ≤ 64 mm

2.10
riffle
shallow part of a stream with swift flow, usually with a broken surface

2.11
substratum
natural or non-natural material from which benthic diatoms are sampled