

**Water quality - Guidance on pro-rata Multi-Habitat  
sampling of benthic macro-invertebrates from wadeable  
rivers**

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN 16150:2012 sisaldab Euroopa standardi EN 16150:2012 ingliskeelset teksti.	This Estonian standard EVS-EN 16150:2012 consists of the English text of the European standard EN 16150:2012.
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 25.04.2012.	Date of Availability of the European standard is 25.04.2012.
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](mailto:standardiosakond@evs.ee).

ICS 13.060.70

### Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:  
Aru 10, 10317 Tallinn, Eesti; [www.evs.ee](http://www.evs.ee); telefon 605 5050; e-post [info@evs.ee](mailto:info@evs.ee)

### The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:  
Aru 10, 10317 Tallinn, Estonia; [www.evs.ee](http://www.evs.ee); phone 605 5050; e-mail [info@evs.ee](mailto:info@evs.ee)

ICS 13.060.70

English Version

## Water quality - Guidance on pro-rata Multi-Habitat sampling of benthic macro-invertebrates from wadeable rivers

Qualité de l'eau - Lignes directrices pour l'échantillonnage  
des macroinvertébrés benthiques en cours d'eau peu  
profonds au prorata des surfaces de recouvrement des  
habitats présents

Wasserbeschaffenheit - Anleitung für die pro-rata Multi-  
Habitat-Probenahme benthischer Makroinvertebraten in  
Flüssen geringer Tiefe (watbar)

This European Standard was approved by CEN on 16 March 2012.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

## Contents

Page

Foreword.....	3
1 Scope .....	4
2 Normative references .....	4
3 Terms and definitions .....	4
4 Description of the sampling approach .....	6
5 Field sampling procedures .....	7
5.1 Factors limiting effective Multi-Habitat-Sampling (MHS).....	7
5.2 Estimation of habitat composition.....	7
5.3 Allocation of sampling units.....	7
6 Detailed description of sampling procedures .....	8
6.1 General recommendations for sampling.....	8
6.2 Megalithal (bedrock and boulders) .....	9
6.3 Macrolithal and mesolithal (cobbles, stones, pebbles) .....	9
6.4 Microlithal and smaller mineral substrates.....	9
6.5 Xylal (woody debris).....	9
6.6 Roots.....	10
6.7 Coarse Particulate Organic Matter (CPOM/leaf litter) .....	10
6.8 Macrophytes (emergent and submerged) .....	10
6.9 Technolithal.....	10
7 Sample treatment.....	10
7.1 Removal of large material and sorting .....	10
7.2 Removal of large organisms.....	10
7.3 Storage.....	10
7.4 Labelling .....	10
7.5 Refining the site-protocol .....	11
Annex A (informative) Sampling protocols.....	12
Bibliography .....	14

## Foreword

This document (EN 16150:2012) 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 October 2012, and conflicting national standards shall be withdrawn at the latest by October 2012.

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.

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, 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.

## 1 Scope

This European Standard gives guidance on procedures for the pro-rata Multi-Habitat-Sampling (MHS) of benthic macro-invertebrates in wadeable rivers and streams. The term "pro-rata" reflects the intention to sample adequate proportions of riverine habitats with reference to their percentage occurrence.

The pro-rata MHS technique does not replace other techniques, but is rather, alongside other applications, a fundamental requisite of some multi-metric assessment approaches used to evaluate the ecological status of running waters. The method described in this document is one of the possible techniques among the existing pro-rata MHS techniques.

The MHS methodology is based on Rapid Bioassessment Protocols [1], the procedures of the Environment Agency for England and Wales [2], the Austrian Guidelines for the Assessment of the Saprobiological Water Quality of Rivers and Streams [3], the AQEM sampling manual [4], the AQEM & STAR site protocol [5], EN 27828, the Austrian Standards M 6232 and M 6119-2 [6], [7], the German Standard DIN 38410-1 [8] and the French Standard XP T90-333 [9].

This European Standard also describes in a detailed manner how to sample different habitats that might be suitable for sampling approaches other than Multi-Habitat-Sampling.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 27828, *Water quality — Methods of biological sampling — Guidance on handnet sampling of aquatic benthic macro-invertebrates (ISO 7828)*

## 3 Terms and definitions

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

- 3.1**  
**akal**  
fine to medium-sized gravel; grain diameter > 0,2 cm to 2 cm
- 3.2**  
**argyllal**  
silt, loam, clay
- 3.3**  
**debris**  
organic and inorganic matter deposited within the splash zone area by wave-motion and changing water levels
- 3.4**  
**hygropetric sites**  
thin water layer on solid (rocky) substrates
- 3.5**  
**investigation site**  
specific area of an investigated river reach for sampling benthic organisms