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**WATER QUALITY - SAMPLING OF FISH WITH
ELECTRICITY**

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Qualité de l'eau - Echantillonnage des poissons à l'électricité

Wasserbeschaffenheit - Probenahme von Fisch mittels Elektrizität

This European Standard was approved by CEN on 5 December 2002.

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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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.



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Foreword

This document (EN 14011:2003) 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of an identical text or by endorsement, at the latest by September 2003, and conflicting national standards shall be withdrawn at the latest by September 2003.

Annex A is informative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

This is the first of several European Standards developed for evaluation of the composition, abundance and diversity of fish in rivers, lakes and coastal waters. Other European Standards will describe sampling of fish with gill nets and guidance on the scope and selection of fish sampling methods.

If used properly electric fishing is considered to be harmless to the fish. However, irreversible damage can be inflicted on fish that are exposed to electricity. Therefore, the well being of the fish and the avoidance of damage through handling should be considered.

WARNING — Persons using this standard should be familiar with normal laboratory and fieldwork practice. This 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 safety and health practices and to ensure compliance with any national regulatory conditions.

1 Scope

This European Standard provides sampling procedures with electricity procedures to be used by trained persons in evaluating fish communities in streams, rivers and littoral areas for the purpose of classification of ecological status. These procedures allow standardisation of sampling methods for descriptions of fish communities. The use of standardised methods is a critical requirement for the comparability of results.

This European Standard describes an electric fishing method to be used when catching fish for the purpose of characterising composition, abundance and age structure of a given fish community. Sampling-related issues include obtaining permissions, concerns about endangered species, protective measures of importance for the user of the sampling apparatus and co-ordination of activities with other sampling programmes.

The processing of samples covers taxonomic identification, counting, measurement of biologic parameters (length, weight etc.), and examination of fish for external anomalies.

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2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the last edition of the publication referred to applies (including amendments).

EN 25667-1:1993, *Water quality — Sampling — Part 1: Guidance on the design of sampling programmes (ISO 5667-1:1980)*.

IEC 60335-2-86, *Safety of household and similar electrical appliances — Part 2-86: Particular requirements for electric fishing machines*.

3 Principle

3.1 General

It shall be recognised that the sampling strategy to be adopted shall provide information on the current status of the fish community health at a given site. The selection of sampling sites (number and size) is of great importance for the evaluation of the collected data. As a general guidance EN 25667-1 shall be consulted, and for more detailed guidance on fish sampling methods forthcoming standards on *Sampling of fish with gill nets* and on *Guidance on the scope and selection of fish sampling methods* are available.

3.2 Fish sampling

Correctly obtained sampling data are directly related to population density. The strategy shall be to sample a defined area of river (see Table 2) using appropriate fishing equipment (clause 4), safety precautions (5.1) and procedures (5.2, clause 6) using qualified personnel (clause 8) to provide estimates of:

- Fish abundance;
- Species composition;
- Population structures (age or size).

Abundance in this context can be either a relative or an absolute measure of assessment based on a single electric fishing run of a known area of water. Where practical or appropriate multiple fishing of the known area shall be carried out to assess the efficiency of the sampling effort to obtain absolute estimates of population density.

To ensure repeatability, fishing effort, fishing equipment and fishing protocols shall be the same on each sampling at the same site. The location of the sampling site shall be identified using GPS or using reference to absolute markers (e.g. X m downstream of XXX bridge). Photographic documentation of the sampling site is recommended. When changing equipment, comparative results with old and new equipment shall be generated, to make it possible to compare new and old data.

3.3 Number and size of sampling sites

Depending on the purpose of the study (*i.e.* assessing abundance and age structure for a target population within a river basin or assessing the species composition, abundance and age structure of a fish community for a given site) two different sampling strategies (3.3.1 or 3.3.2) can be used.

3.3.1 Abundance and age structure of populations

To ensure that conclusions on abundance and age structure are valid for the target population(s), a sufficient number of sites (n) shall be included. This number depends on the spatial variation among sites and whether assessing temporal trends or comparisons between populations is the main aim. The spatial variation is expressed

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