



Institut luxembourgeois de la normalisation
de l'accréditation, de la sécurité et qualité
des produits et services

ILNAS-EN 14757:2005

**Water quality - Sampling of fish with
multi-mesh gillnets**

Qualité de l'eau - Echantillonnage des
poissons à l'aide de filets maillants

Wasserbeschaffenheit - Probenahme von
Fisch mittels Multi-Maschen-
Kiemennetzen

08/2005



National Foreword

This European Standard EN 14757:2005 was adopted as Luxembourgish Standard ILNAS-EN 14757:2005.

Every interested party, which is member of an organization based in Luxembourg, can participate for FREE in the development of Luxembourgish (ILNAS), European (CEN, CENELEC) and International (ISO, IEC) standards:

- Participate in the design of standards
- Foresee future developments
- Participate in technical committee meetings

<https://portail-qualite.public.lu/fr/normes-normalisation/participer-normalisation.html>

THIS PUBLICATION IS COPYRIGHT PROTECTED

Nothing from this publication may be reproduced or utilized in any form or by any mean - electronic, mechanical, photocopying or any other data carries without prior permission!

EUROPEAN STANDARD ILLNAS-EN 14757:2005 **EN 14757**
NORME EUROPÉENNE
EUROPÄISCHE NORM August 2005

ICS 13.060.70; 65.150

English Version

Water quality - Sampling of fish with multi-mesh gillnets

Qualité de l'eau - Echantillonnage des poissons à l'aide de
filets maillants

Wasserbeschaffenheit - Probenahme von Fisch mittels
Multi-Maschen-Kiemennetzen

This European Standard was approved by CEN on 27 June 2005.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

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



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

page

Foreword	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	5
4 Principle	5
5 Sampling design and equipment	5
6 Time series sampling	7
7 Inventory sampling	10
8 Sampling routine	11
9 Data handling and reporting	12
10 Corrections for gillnet selectivity for six fish species	15
11 Estimate of sampling variance	17
12 Sampling fish for age- and growth analysis	18
13 Applications and further analyses	20
14 Limitations and supplementary sampling	21
Annex A (informative) Distribution of benthic multi-mesh gillnets at different depth strata in lakes with different area and maximum depth	22
Annex B (informative) Example of forms for registration of fish and supplementary data	24
Bibliography	27

Foreword

This European Standard (EN 14757:2005) 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 February 2006, and conflicting national standards shall be withdrawn at the latest by February 2006.

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

Introduction

This is the second of several European Standards developed for evaluation of the species composition, abundance and age structure of fish in rivers, lakes and transitional waters. Other standards describe “Sampling of fish with electricity” (EN 14011) and “Guidance on the scope and selection of fish sampling methods” (prEN 14962).

In most countries the use of the method specified in this European Standard requires permits from landowners and national or regional authorities. In many countries permits are also required from authorities for animal rights and animal welfare demands. Both fish diseases and diseases specific for other organisms, such as freshwater crayfish, may be spread by placing equipment contaminated with pathogens or parasites in the lake. The user of this method should check which national legislation is applicable.

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

IMPORTANT — It is absolutely essential that tests conducted according to this standard be carried out by suitably trained staff.

1 Scope

This European Standard describes a standardised method for sampling fish in lakes, using multi-mesh gillnets. The method provides a whole-lake estimate for species occurrence, quantitative relative fish abundance and biomass expressed as Catch Per Unit Effort (CPUE), and size structure of fish assemblages in temperate lakes. It also provides estimates, which are comparable over time within a lake and between lakes. This European Standard provides information on sampling routines, data handling and reporting, sampling of fish for age and growth analyses as well as applications and further treatment of data. Selected references in support of this European Standard are given in the Bibliography.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

prEN 14962:2004, *Water quality — Guidance on the scope and selection of fish sampling methods*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in prEN 14962:2004 apply.

4 Principle

The sampling procedure is based on stratified random sampling. The sampled lake is divided in depth strata and random sampling is performed within each depth stratum. Sampling of benthic fish is performed with specially designed multi-mesh gillnets which are 30 m long and 1,5 m deep. The gillnets are composed of 12 different mesh-sizes ranging between 5 mm to 55 mm knot to knot following a geometric series. Gillnets used for sampling pelagic fish are 27,5 m long and 6 m deep, with the smallest mesh-size being 6,25 mm. The sampling effort needed to allow detection of 50 % changes in relative abundance between sampling occasions, range between 8 gillnets per night (efforts) for small, shallow lakes, up to 64 efforts for lakes of about 5 000 ha. When less accurate estimates of abundance are needed, an inventory sampling procedure may be used, thereby reducing the number of efforts needed.

5 Sampling design and equipment

5.1 Sampling design

Fish are not randomly distributed over a lake. Depth distribution varies between fish species and with the ontogeny of the fish. The horizontal distribution may also be influenced by habitat heterogeneity. Neither is the distribution constant over the year, but will vary with temperature and season.

To cope with this uneven distribution a stratified random sampling design is used. The lake is stratified in depth strata and a random sampling is performed within each depth stratum. Each gillnet is placed to represent an independent sample of the fish assemblage. By randomising the location of each gillnet within each depth stratum and by randomising the angle of the gillnet in relation to shoreline, an independent sample of the fish in each stratum will be achieved. Randomisation is performed prior to fishing by the aid of depth maps and a co-ordinate grid. If needed, the angle of the gillnet in relation to the shoreline shall be adjusted so that the gillnet is within the corrected depth stratum.

5.2 Benthic gillnets

The multi-mesh gillnets have been designed for catching all types of freshwater fish species. Each gillnet is composed of 12 different mesh-sizes ranging from 5 mm to 55 mm (knot to knot). The mesh-sizes follow a geometric series, with a ratio between mesh-sizes of about 1,25. All gillnets have the same order of mesh panels (see Table 1).

If experience has shown that large fish of certain species (e.g. bream, pike, tench) are difficult to catch with the mesh sizes shown in Table 1, then these may be modified as required. However, a note on such modification shall be given in the report (fishing protocol).

Table 1 — Mesh-size distribution (knot to knot) and thread diameter in the multi-mesh benthic gillnets

Mesh no	Mesh size mm	Thread diameter mm
1	43	0,20
2	19,5	0,15
3	6,25	0,10
4	10	0,12
5	55	0,25
6	8	0,10
7	12,5	0,12
8	24	0,17
9	15,5	0,15
10	5	0,10
11	35	0,20
12	29	0,17

The gillnets shall be made out of homogeneous, uncoloured nylon. Each gillnet shall be 30 m long and 1,5 m deep. Each mesh panel shall be 2,5 m long and mounted on a 30 m long buoyancy line (with a recommended linear density in water of 6 g/m), and a 33 m long lead line (recommended linear density in air 22 g/m and in water 9,9 g/m) made out of plastic in light grey colour. The diameter of the thread varies between 0,10 mm for the 5 mm mesh, to 0,25 mm for the 55 mm mesh (Table 1). All mesh panels are commercially available. The hanging ratio is 0,5 for all mesh sizes.

5.3 Pelagic gillnets

Each pelagic gillnet is 27,5 m long and 6 m deep. Gillnets used for sampling pelagic habitats are similar to the benthic gillnets with the following exception. The smallest mesh (5 mm) has been excluded, because it has not been possible to manufacture 5 mm panels mesh as deep as 6 m. The buoyancy line is 30 m, and the lead line is 45 m with a hanging ratio of 0,5. The weight of the lines may be different from that of the benthic nets. The pelagic nets are divided in half at 3 m depth by inserting a darkish colour (e.g. made of spun nylon) in order to separate the catches below and above 3 m depth.