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МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

Water quality — Design and use of quantitative samplers for benthic macro-invertebrates on stony substrata in shallow freshwaters

Qualité de l'eau — Conception et utilisation des échantillonneurs de macro-invertébrés benthiques sur substrat rocailleux dans les eaux douces peu profondes

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 8265 was prepared by Technical Committee ISO/TC 147, *Water quality*.

Annex A forms an integral part of this International Standard.

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Introduction

The "Surber"[1] and "cylinder" samplers described in this International Standard are designed to remove benthic macro-invertebrates from a defined shape and area of substrate of a bed of a water body. Hence these samplers are sometimes called quadrat samplers. They may be regarded as quantitative counterparts of the handnet sampling method described in ISO 7828, *Water quality — Methods of biological sampling — Guidance on handnet sampling of aquatic benthic macro-invertebrates*. They are usually used in water with a depth of less than 500 mm and are thus restricted to use in shallow water, particularly the "Surber", which should preferably not be submerged. Although the samplers can also be used in deeper water by a diver, it must be emphasised that they were not originally designed for that purpose. Their basic design is described as part of this International Standard. Modifications are presented in annex A.

1) Named after the biologist, E. W. Surber, who originally designed this apparatus.

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Safety precautions — Working alone in water is not recommended in view of the risks from high current velocities, deep waters and unstable beds.

1 Scope

This International Standard gives guidance on the equipment and procedures for the quantitative sampling of benthic macro-invertebrates by quadrat samplers in waters of depth less than 500 mm, although methods are described to permit sampling, under certain conditions, in a water depth of up to 1 m.

The procedures are applicable to the sampling of all accessible aquatic habitats in rivers, streams and estuaries where current velocities in excess of 0,1 m/s would be expected, but the samplers, with modifications, may be used in locations of low current velocity, such as ponds and lakes (see annex A). Sampling may be difficult or impossible where the substrate includes large stones and boulders or dense stands of macrophytes (rooted plants). The results of using the samplers provide quantitative data on the presence, diversity and relative abundance of taxa.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent edition of the standard listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 5667-3 : 1985, *Water quality — Sampling — Part 3: Guidance on the preservation and handling of samples.*

3 Principle

Sampling of benthic macro-invertebrates in shallow running water by collection using a quadrat sampler, which isolates a portion of the bed of the water body. Disturbance of the substrate leads to release of macro-invertebrates, from attachment or burial, and they are carried into the net by the current.

4 Apparatus

4.1 Surber sampler

The sampler [see figure 1a)] consists of two frames hinged together, one supporting the net and the other defining the sampling area. The whole sampler weighs about 2 kg, folds flat and is easy to carry. Each frame, and therefore the sampling area, is usually a square of dimensions 300 mm × 300 mm, to give a sampling area and a net mouth of 0,09 m^2 [see figure 1b)]. Two braces lock the two frames into the working position at right angles to each other, and two triangular wings of netting or canvas reduce the loss of invertebrates around the sides of the net.

NOTE — The surface of the sampling area is generally 0,09 m^2 but the frame dimensions can be modified in order to obtain a surface area that permits the sampler to fulfil the objectives of the sampling.

The net should be about 700 mm long, with a collar of heavier material (e.g. canvas or sail-cloth) for a short section around the mouth [see figure 1a)]. This collar increases the durability of the net, and may be extended under the net to protect it from abrasion. The original net was tapered slightly to a dome-shape at the rear end, but pocket-shaped and cone-shaped nets are now frequently used. In figure 1d) the net is shown with a collar of sail-cloth for a short section around the mouth and extended under the net.

Another and stronger construction of a Surber sampler is shown in figure 2, in which the two frames are replaced by a box with an open bottom and top, solid sides, a net on the downstream side and a screen on the upstream side. The box minimizes the loss of invertebrates and in addition gives the sampler additional strength and stability. The sampler is also easier to operate than the original in high current velocities.

The choice of mesh size depends on the objectives of the survey. Table 1 gives details of appropriate sizes.

4.2 Cylinder sampler

The sampler consists essentially of an open-ended cylinder, constructed of about 0,5 mm thick stainless steel, having the lower edge serrated with teeth, each 10 mm deep. The upper edge may be covered by a plastics edging strip to protect