



Standard Practice for Collecting Benthic Macroinvertebrates with Surber and Related Type Samplers¹

This standard is issued under the fixed designation D 4557; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice covers the procedures for obtaining a sample of macroinvertebrates inhabiting mud, sand, gravel, or rubble substrate.

1.2 The device is restricted to use in shallow streams or shallow areas of rivers, and it depends on a water velocity of not less than 0.05 m/s to wash the sample into a net.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.* For a specific hazard statement, see 6.8.

2. Referenced Documents

2.1 ASTM Standards:

D 1129 Terminology Relating to Water²

D 4556 Guide for Selecting Stream-Net Sampling Devices for Collecting Benthic Macroinvertebrates³

3. Terminology

3.1 Definitions:

3.1.1 For definitions of terms used in this practice, see Terminology D 1129.

4. Summary of Practice

4.1 The Surber sampler consists of two 30.5-cm frames, hinged together; one frame rests on the substrate, the other remains upright and holds the nylon net. The sampler is positioned with its net mouth open, facing upstream.

4.2 When in use, the two frames are locked at right angles, one frame marking off the area of substrate to be sampled and the other frame supporting a net to strain out organisms washed into it from the sample area.

4.3 Modification of the Surber sampler to overcome some of the limitations of its use (for example, loss of organisms due to

backwash) has resulted in the design and construction of a number of related sampling devices, such as the four-sided (enclosed) portable invertebrate box sampler, the cylindrical Hess sampler, the cylindrical Hess stream bottom sampler, and the cylindrical stream-bed fauna sampler.

4.4 Operation of the portable invertebrate box, Hess, Hess stream bottom, and stream-bed fauna samplers are similar to the Surber sampler.

4.5 The net used to collect macroinvertebrates can vary in mesh size, length, taper, and material, for example, canvas, taffeta, or nylon monofilament.

4.6 The net is usually made of nylon, and a variety of mesh sizes is available. The mesh size used will depend on the objectives of the study. A mesh size of 0.35 mm, for example, will retain most instars of aquatic insects.

4.7 While a smaller mesh size might increase the number of smaller invertebrates and young instars collected, it will clog more easily and exert more resistance to the current than a larger mesh, possibly resulting in a loss of organisms due to backwashing from the sample net.

4.8 It should be noted that these samplers are specific for macroinvertebrates, and that many of the micro-components of the benthos will not be collected.

4.9 The Surber, portable invertebrate box, Hess, Hess stream bottom, and stream-bed fauna samplers sample an area of 0.1 m².

4.10 The polyester foam base of the portable invertebrate box sampler conforms to a variety of substrates to prevent the loss of organisms from beneath the sampler. The Hess, Hess stream bottom, and stream-bed fauna samplers can be “turned” into most sediment types to a depth of several centimetres. The Surber sampler rests on the surface of most sediments.

4.11 When sampling is completed, the net of the portable invertebrate box sampler slides out for cleaning or exchange with a different net. Hess-type samplers may have a mason jar ring and an adapter with a fixed or removable cloth net bucket.

4.12 These samplers are designed for use in shallow, flowing waters.

4.13 These samplers cannot be used as efficiently in still or deep water.

4.14 These samplers are best used in water of 30.48-cm (1-ft) depth or less.

¹ This practice is under the jurisdiction of ASTM Committee E47 on Biological Effects and Environmental Fate and is the direct responsibility of Subcommittee E47.03 on Terrestrial Assessment and Toxicology.

Current edition approved Dec. 27, 1985. Published May 1986.

² *Annual Book of ASTM Standards*, Vol 11.01.

³ *Annual Book of ASTM Standards*, Vol 11.05.