ASTM INTERNATIONAL

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Standard Practice for
Collecting Benthic Macroinvertebrates With Orange Peel Grab Sampler[1]

This standard is issued under the fixed designation D 4407; 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 qualitative bottom samples of macroinvertebrates inhabiting sand, cobble, rubble stone, and similar substrates.

1.2 The sampler should not be used in critical quantitative work that is to be compared with results of other areas and is recommended as a reconnaisance sampler only.

1.3 This device is used primarily in marine waters and deep lakes.

1.4 For the advantages and limitations of selecting grab sampling devices, see Guide D 4387.

1.5 *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 specific hazards, see Section 5.

2. Referenced Documents

2.1 *ASTM Standards:*
D 4387 Guide for Selecting Grab Sampling Devices for Collecting Benthic Macroinvertebrates[2]

3. Summary of Practice

3.1 The Orange-Peel grab sampler has four curved jaws that close to encircle a hemisphere of sediment and must penetrate the intended substrate without disturbing the water surface boundary of the substrate, close when positioned properly on the bottom, and retain discrete samples of sediment while it is brought to the surface for processing.

3.2 A recent modification of the Orange Peel, described by Reish (1959)[3] has a new trigger mechanism and more efficient closing jaws, and the volume of sample to surface-area

sampled relationship has been worked out.

3.3 The surface area of this device also varies with penetration depth or volume sampled.

3.4 The device penetrates to a maximum depth of 18 cm, but this depth will vary.

4. Significance and Use

4.1 The Orange-Peel grab sampler is used to collect qualitative samples from different aquatic habitats containing benthic macroinvertebrates living on or in various types of substrates.

4.2 The organisms in the sample are used to define macroinvertebrate community characteristics in water quality studies and ecological assessments.

5. Hazards

5.1 This sampler cannot be used under adverse weather conditions.

5.2 The Orange Peel should be inspected for mechanical defects prior to use.

5.3 When taking samples, a stationary boat or platform should be used.

6. Procedure

6.1 Lower the sampler to the bottom by a powered winch and cable.

6.2 Lower the sampler at a slow but steady rate.

6.3 Once the sampler reaches the bottom, the jaws are operated by a large wheel and sprocket mechanism within the upper frame work, and may be operated by a second cable or by a slack release mechanism activated by a messenger.

6.4 The sampler is retrieved slowly, but to prevent sample loss a loosely fitted canvas sleeve can be placed on the upper works to prevent washing out of the sample.

6.5 Once the sample is on board, empty it either into a suitable container or a sieving device directly for processing.

6.6 Thoroughly wash or hose the device with water, so that all sediment material is included in the sample processing before a replicate sample is taken.