



Designation: D 5313 – 92 (Reapproved 1997)

Standard Test Method for Evaluation of Durability of Rock for Erosion Control Under Wetting and Drying Conditions¹

This standard is issued under the fixed designation D 5313; 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 test method covers procedures for evaluating the durability of rock for erosion control when exposed to wetting and drying conditions.

1.2 The values stated in SI units are to be regarded as the standard.

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.*

2. Referenced Documents

2.1 ASTM Standards:

D 4992 Practice for Evaluation of Rock to be Used for Erosion Control²

D 5121 Practice for the Preparation of Rock Slabs for Durability Testing²

3. Significance and Use

3.1 Rock used for erosion control may consist of several types, depending on potential use. One type may be armor stone weighing from one to three tons or breakwater stone weighing three to twenty tons placed along shorelines or in jetties to protect the shoreline from erosion due to the action of large waves. Another type may be riprap usually weighing less than a ton and placed along river banks or on the slopes of dams to prevent erosion due to run-off, wave action or stream-flow. A third type may be gabion-fill weighing less than fifty pounds and placed in baskets of wire or other suitable material. These baskets are then tied together to form an integral structure designed to resist erosion along stream banks and around bridge piers. No matter what form it takes, rock for erosion control consists of individual pieces of natural stone. The ability of these individual pieces of stone to resist

deterioration due to weathering action affects the stability of the integral placement of rock for erosion control and hence, the stability of construction projects, shorelines, and stream-banks.

3.2 This test method is designed to determine the effects on the individual pieces of rock for erosion control of wetting and drying action and the resistance of the rock to deterioration. This test method was developed to be used in conjunction with additional test methods listed in Practice D 4992. This test method does not provide an absolute value but rather an indication of the resistance to wetting and drying; therefore, the results of this test method are not to be used as the sole basis for the determination of rock durability.

4. Apparatus

4.1 *Diameter Circular Diamond Saw*, 14 in. (355.60 mm) capable of sawing rock, of the type required for Practice D 5121.

4.2 *Containers*, to hold the specimens fully immersed in potable water. These containers must be non-reactive and unbreakable.

4.3 *Oven*, capable of drying the specimen to a constant mass at a temperature of $110 \pm 5^\circ\text{C}$.

4.4 *Drying Apparatus*, such as infra-red heat lamps (150 W) or oven set at $65 \pm 5^\circ\text{C}$.

4.5 *Stereomicroscope*, or other suitable magnifying device capable of at least $20\times$ magnification will be required for examination of the specimen prior to and after testing.

4.6 *Balance*, capable of determining the mass of the specimen to the nearest 0.1 % of the total mass will be required.

4.7 *Camera*, capable of producing good quality, color photographs will be required for “before” and “after” photographs.

5. Sampling, Test Specimens, and Test Units

5.1 The number and variety of samples from a source will be dependent on the geological complexity of that source and will be left to the judgment of the individual doing the sampling; however, in no case shall the number of samples be less than five per lithologic (rock) unit. Each piece will be of a size such that testing may proceed without further mechanical crushing; however, the pieces chosen shall be as large as the

¹ This test method is under the jurisdiction of ASTM Committee D-18 on Soil and Rock and is the direct responsibility of Subcommittee D18.17 on Rock for Erosion Control.

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² *Annual Book of ASTM Standards*, Vol 04.08.