



Standard Test Method for Evaluation of Durability of Rock for Erosion Control Under Freezing and Thawing Conditions¹

This standard is issued under the fixed designation D5312/D5312M; 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 the procedures for evaluating the durability of rock for erosion control when exposed to freezing and thawing conditions on slabs of rock. This weathering test exposes the rock to freezing and thawing cycles similar to natural weather conditions. The rock slabs, prepared in accordance with procedures in Practice [D5121](#), are intended to be representative of erosion control rock and its weaknesses. The test is appropriate for breakwater stone, armor stone, riprap, and gabion sized rock materials.

The limitations of the test are twofold. First the size of the cut rock slab specimens may eliminate some of the internal defects present in the rock structure. The test specimens may not be representative of the quality of the larger rock samples used in construction. Careful examination of the rock source and proper sampling are essential in minimizing this limitation. Secondly the test requires the rock slabs to be exposed to up to 55 freezing-thawing cycles. The test is time intensive and may require up to two or more months to complete the sample preparation, testing, and analysis portions of the procedure.

1.2 The use of reclaimed concrete and other materials is beyond the scope of this test method.

1.3 *Units*—The values stated in either SI units or inch-pound units [presented in brackets] are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

1.4 All observed and calculated values shall conform to the guidelines for significant digits and rounding established in Practice [D6026](#), unless superseded by this standard.

1.4.1 For purposes of comparing measured or calculated value(s) with specified limits, the measured or calculated value(s) shall be rounded to the nearest decimal or significant digits in the specified limits.

1.4.2 The procedures used to specify how data are collected/recorded or calculated, in this standard are regarded as the industry standard. In addition, they are representative of the significant digits that generally should be retained. The procedures used do not consider material variation, purpose for obtaining the data, special purpose studies, or any considerations for the user's objectives; and it is common practice to increase or reduce significant digits of reported data to be commensurate with these considerations. It is beyond the scope of this standard to consider significant digits used in analytical methods for engineering design.

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.*

2. Referenced Documents

2.1 ASTM Standards:²

- [D653 Terminology Relating to Soil, Rock, and Contained Fluids](#)
- [D2216 Test Methods for Laboratory Determination of Water \(Moisture\) Content of Soil and Rock by Mass](#)
- [D3740 Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction](#)
- [D4753 Guide for Evaluating, Selecting, and Specifying Balances and Standard Masses for Use in Soil, Rock, and Construction Materials Testing](#)
- [D4992 Practice for Evaluation of Rock to be Used for Erosion Control](#)
- [D5121 Practice for Preparation of Rock Slabs for Durability Testing](#)
- [D6026 Practice for Using Significant Digits in Geotechnical Data](#)
- [E145 Specification for Gravity-Convection and Forced-Ventilation Ovens](#)

¹ This test method is under the jurisdiction of ASTM Committee [D18](#) on Soil and Rock and is the direct responsibility of Subcommittee [D18.17](#) on Rock for Erosion Control.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.