



Designation: D 5240 – 92 (Reapproved 1997)

## Standard Test Method for Testing Rock Slabs to Evaluate Soundness of Riprap by Use of Sodium Sulfate or Magnesium Sulfate<sup>1</sup>

This standard is issued under the fixed designation D 5240; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This test method covers test procedures for evaluating the soundness of riprap by the effects of a sodium or magnesium sulfate solution on slabs of rock.

1.2 The values stated in either SI or inch-pound 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:

C 88 Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate<sup>2</sup>

C 295 Practice for Petrographic Examination of Aggregates for Concrete<sup>2</sup>

D 4753 Specification for Evaluating, Selecting, and Specifying Balances and Scales for Use in Soil and Rock Testing<sup>3</sup>

D 4992 Practice for Evaluation of Rock to Be Used for Erosion Control<sup>3</sup>

D 5121 Practices for Preparation of Rock Slabs for Durability Testing<sup>3</sup>

### 3. Significance and Use

3.1 Rock riprap is composed of pieces of natural rock that are placed on construction projects to minimize the effects of erosion. The ability of riprap to withstand deterioration from weathering affects both the effectiveness of the project and its cost. The sodium sulfate or magnesium sulfate soundness test is one method by which to estimate qualitatively the durability of rock under weathering conditions.

3.2 The results of this test method are not to be used as the sole basis for determination of rock durability, but rather should always be used in conjunction with the results of other tests.

3.3 This test method has been used to evaluate many different types of rocks. There have been occasions when test results have provided data that have not agreed with the durability of rock under actual field conditions; samples yielding a low soundness loss have disintegrated in actual usage, and the reverse has been true.

### 4. Apparatus

4.1 *Circular Diamond Saw*, 14-in. (360-mm) diameter, capable of sawing rock, of the type required for Practices D 5121.

4.2 *Apparatus*, as required by Test Method C 88, with the following exception: sieves are not required, and the balance shall meet the requirements of Class GP 10 in Specification D 4753 and be accurate within 5 g.

### 5. Special Solutions Required

5.1 The solutions required in this test method shall be the sodium or magnesium sulfate solutions required by Test Method C 88, and they shall be prepared and used in the same manner.

### 6. Samples

6.1 A source of rock to be sampled, shall be guided by Practice D 4992 (mine, quarry, outcrop, or field boulders) that is macroscopically uniform in color, texture, mineralogy, or some other visual property shall be represented by a sample consisting of a minimum of five pieces of rock, and a macroscopically nonuniform source shall be represented by a minimum of eight pieces of rock. Each piece of rock shall be of a size such that testing can proceed without further mechanical crushing. In all cases, the pieces shall be chosen to provide a visually unbiased sample of the majority of rocks present at a source. Rock types, as determined from their macroscopic properties, that comprise less than 5 % of the source may be ignored unless their presence in a sample will greatly affect the test results and subsequent proposed use of the rock.

<sup>1</sup> 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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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 04.02.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 04.08.