



Designation: D6473 – 99 (Reapproved 2005)

Standard Test Method For Specific Gravity And Absorption of Rock For Erosion Control¹

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1. Scope

1.1 This test method covers the determination of specific gravity and absorption of rock for erosion control, commonly referred to as riprap or armor stone. The specific gravity may be expressed as bulk specific gravity or apparent specific gravity. Bulk specific gravity and absorption are based on a 24-h soaking time for the rock specimens tested.

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

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

1.4 *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

[C127 Test Method for Density, Relative Density \(Specific Gravity\), and Absorption of Coarse Aggregate](#)

[D653 Terminology Relating to Soil, Rock, and Contained Fluids](#)

[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](#)

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 and 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.

3. Terminology

3.1 *Definitions*—Definitions for terms in this test method shall be in accordance with Terminology D653 except as noted in 3.2.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *absorption*—the increase in the mass of rock due to water in the pores of the material, but not including water adhering to the outside surface of the particles. Absorption is expressed as a percentage of the dry mass. The rock is considered “dry” if it has been maintained in an environment for sufficient time to remove all visible water.

3.2.2 *apparent specific gravity*—the ratio of (1) the mass in air of a given volume of the impermeable portion of a permeable material (that is, the solid matter including its impermeable pores or voids) at a stated temperature to (2) the mass of an equal volume of distilled water at the same stated temperature. The value is dimensionless.

3.2.3 *bulk specific gravity*—the ratio of (1) the mass in air of a given volume of a permeable solid (including both permeable and impermeable voids within the material) at a stated temperature, to (2) the mass in air of an equal volume of distilled water at the same stated temperature. The value is dimensionless.

3.2.4 *bulk specific gravity (saturated surface-dry) (SSD)*—the ratio of (1) the mass of a given volume of permeable solid, (including the mass of water within the saturated permeable voids) filled to the extent achieved by submerging in water for approximately 24 h at the stated temperature to (2) the mass of an equal volume of water at the same stated temperature. The value is dimensionless.

3.2.5 *specific gravity*—the ratio of (1) the mass in air of a given volume of solid at a stated temperature to (2) the mass of an equal volume of distilled water at the same stated temperature. The value is dimensionless.

4. Summary of Test Method

4.1 An air-dried specimen (block, chunk, or slab) of rock is submerged in water for 24 h after which it is weighed while still submerged. It is then removed from the water, dried to a surface dry condition, and weighed again. Finally it is dried in an oven for a specified length of time and weighed again. The