Designation: C 121 – 90 (Reapproved 1999)

Standard Test Method for Water Absorption of Slate[1]

This standard is issued under the fixed designation C 121; 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.

This standard has been approved for use by agencies of the Department of Defense.

INTRODUCTION

It is often desirable to gain some idea of the porosity of a material in question. Actual determinations of the pore space require the use of rather elaborate and refined equipment as well as considerable precision in carrying out the tests. For comparative purposes the absorption test affords a simple and sufficiently accurate means of obtaining the desired information. As applied to slate this test requires somewhat more care and precision than many other materials because of its dense nature and, consequently, the small quantities to be dealt with. Furthermore, the cleavage of slate—that property which permits it to be split into thin sheets of uniform thickness—must be taken into consideration when this test is made. On this account misleading results are often obtained on cubical specimens due to accidental cleavage cracks in the specimens. The shapes of specimens and larger number of specimens recommended in the following procedure are intended to eliminate to a large extent the inconsistent results which may be obtained on this material.

1. Scope

1.1 This test method covers the determination of the water absorption of slate.

1.2 *This standard does not purport to address the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

C 119 Terminology Relating to Dimension Stone[2]

3. Terminology

3.1 *Definitions*—All definitions are in accordance with Terminology C 119.

4. Significance and Use

4.1 This test method is useful in indicating the differences in water absorption of slates. This test method also provides one element in the comparison of slates.

5. Test Specimens

5.1 The test specimens shall consist of square or rectangular slabs from 3⁄16 to 5⁄16 in. (4.8 to 7.9 mm) in thickness and not less than 4 in. (101.6 mm) on any side.

5.2 Not less than six specimens shall be prepared from each sample of slate, the sample being considered as any number of pieces selected to represent a definite part or grade of the deposit.

6. Preparation of Specimens

6.1 Split the slate to the required thickness and saw to size. When the specimens are prepared from shingles no saw cut shall be nearer than 1 in. (25.4 mm) to the sheared edge of the shingle.

6.2 Free the specimens from loose particles by scrubbing with a fiber brush and clean water.

7. Procedure, Preferred Method

7.1 Dry the specimens for 48 h in a ventilated oven at a temperature of 60 ± 2°C (140 ± 4°F). At the 46th, 47th, and 48th hour, weigh the specimens to ensure that the weight is the same. If the weight continues to drop, continue to dry the specimens until there are three successive hourly readings with the same weight.

7.2 After drying, cool the specimens in the room for 15 min and then weigh. When the specimens cannot be weighed immediately after cooling, place them in a desiccator. Determine the weight to the nearest 0.01 g.

7.3 Entirely immerse the specimens in filtered or distilled

[1] This test method is under the jurisdiction of ASTM Committee C-18 on Dimension Stone and is the direct responsibility of Subcommittee C18.01 on Test Methods.

Current edition approved April 27, 1990. Published June 1990. Originally published as C 121 – 25 T. Last previous edition C 121 – 85ε[1].

[2] *Annual Book of ASTM Standards*, Vol 04.07.

water at approximately 68 ± 9°F (20 ± 5°C) for 48 h, remove one at a time, wipe the surface dry with a slightly damp, absorbent towel (Note 1) and immediately weigh each specimen to the nearest 0.01 g.

NOTE 1—The operator should distinguish between a damp towel and a wet one. In starting the operation, the towel should be sprinkled lightly. When the surface of the specimen is properly wiped off, it should appear dry.

8. Procedure, Alternative Method

8.1 Occasionally it is desirable to obtain results in a shorter period than that required by the procedure described in Section 7. In such cases, the 48-h immersion period may be supplanted by an 8-h boiling period (Note 2). In this alternative method the operations shall be the same as described in Section 7 up to that of immersion. Instead of allowing the specimens to soak for 48 h place them in an enameled pan or other suitable vessel, cover with water, and boil for 8 h. Before the final weighing, cool the specimens by allowing tap water to flow over them for at least 30 min.

NOTE 2—Boiling for 8 h has been found to give practically the same saturation as immersion for 48 h.

9. Calculation and Report

9.1 Calculate the percentage of absorption as follows:

$$\text{Absorption, \%} = [(W_2 - W_1)/W_1] \times 100 \quad (1)$$

where:
W_1 = weight of the dried specimen, and
W_2 = weight of the specimen after immersion.

9.2 Report the average of all the tests as the absorption of slate. All the determinations shall be reported as information.

10. Precision and Bias

10.1 Individual variations in a natural product may result in deviation from accepted values. A precision section will be added when sufficient data are available to indicate acceptable tolerances in repeatability and reproducibility.