



Designation: C120/C120M – 15a

Standard Test Methods for Flexure Testing of Structural and Roofing Slate¹

This standard is issued under the fixed designation C120/C120M; 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.

INTRODUCTION

Breaking load test results of roofing slate under this test method are only valid for the commercial supply of slates of that thickness or greater. For the commercial supply of thinner roofing slates, testing on samples of the minimum specified thickness must be conducted.

When comparing roofing slates of equal thickness, but from various sources, slates which meet the required breaking load at the lowest specimen thickness will yield the best performance on the roof in terms of resistance to impact damage.

The reliability of the data produced under this test method is largely influenced by the care and protocol used in obtaining and preparing the test specimens.

1. Scope

1.1 These test methods cover determination of the breaking load of roofing slate and modulus of rupture of structural slate by use of simple three-point loading.

1.2 The values stated in either SI units or inch-pound units 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.

1.3 *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:*²

[C119 Terminology Relating to Dimension Stone](#)

[C406 Specification for Roofing Slate](#)

[C629 Specification for Slate Dimension Stone](#)

[E4 Practices for Force Verification of Testing Machines](#)

[E145 Specification for Gravity-Convection and Forced-Ventilation Ovens](#)

3. Terminology

3.1 *Definitions*—All definitions are in accordance with Terminology [C119](#).

4. Summary of Test Method

4.1 Prepared and conditioned test specimens are placed on two support blocks in a test stand and loaded vertically at their center point by a third block.

5. Significance and Use

5.1 These test methods are useful in indicating the differences in flexure (breaking load, modulus of rupture) between various slates. These test methods also provide one element in the comparison of roofing slates under Specification [C406](#) and structural slates under Specification [C629](#).

6. Apparatus

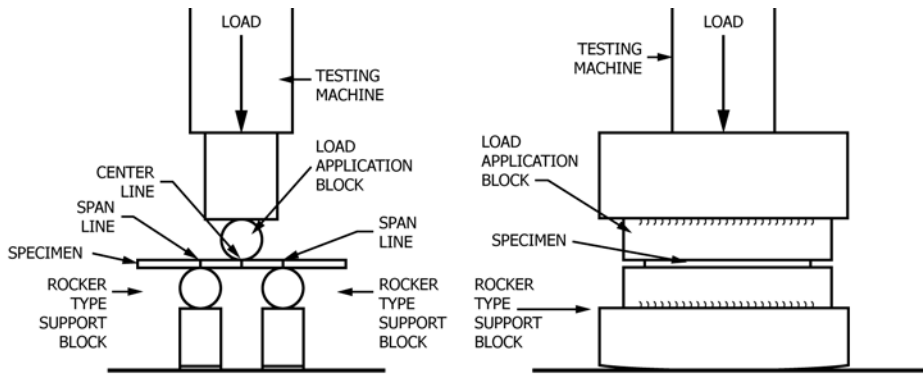
6.1 *Ventilated Oven*—Conforming to the requirements of the applicable sections of Specification [E145](#), and capable of maintaining a temperature of $140 \pm 4^\circ\text{F}$ ($60 \pm 2^\circ\text{C}$) and large enough to accommodate the test specimens.

6.2 *Testing Machine*—(see [Fig. 1](#)), conforming to the requirements of the applicable sections of Practices [E4](#). The three-point loading method shall be used in conducting flexure tests employing support and loading blocks that will ensure that forces applied to the beam shall be vertical only and applied without eccentricity. The apparatus should be capable of maintaining the span length and distances between the loading block and support blocks within ± 0.05 in. (± 1 mm). The load

¹ These test methods are under the jurisdiction of ASTM Committee [C18](#) on Dimension Stone and are the direct responsibility of Subcommittee [C18.01](#) on Test Methods.

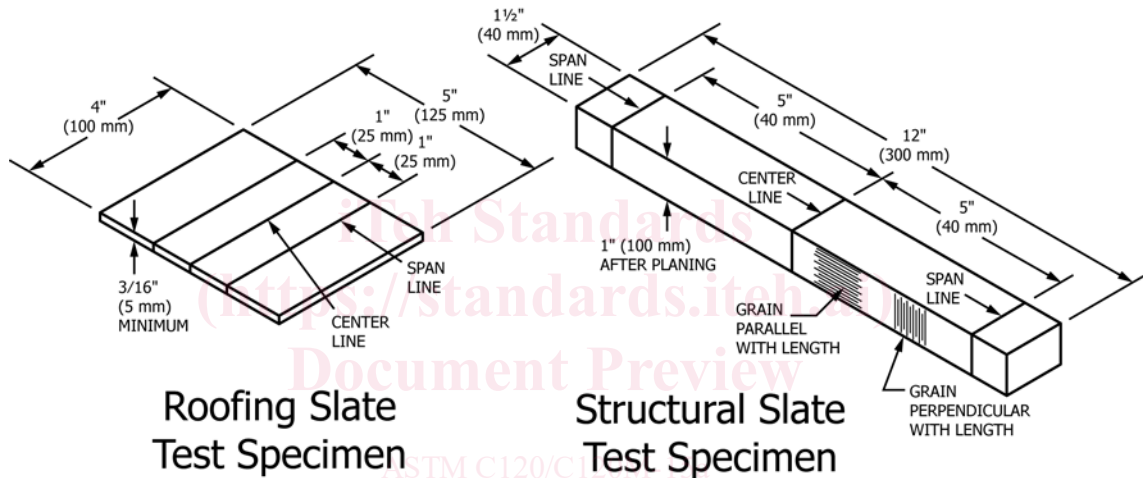
Current edition approved Nov. 15, 2015. Published January 2016. Originally approved in 1925. Last previous edition approved in 2015 as C120/C120M-15. DOI: 10.1520/C0120_C0120M-15A.

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.



Specimen in Position for Testing

The test apparatus shown is one example of an acceptable configuration. Other configurations meeting the requirements of Section 6 are also acceptable.



Roofing Slate Test Specimen

Structural Slate Test Specimen

FIG. 1 Specimens and Preferred Type of Loading Application and Support Blocks for Determining the Breaking Load and Modulus of Rupture of Slate

should be capable of being applied at a uniform rate and in such a manner as to avoid shock. The accuracy of the testing machine shall be within 1 % for the range from 10 to 1000 lbf [50 to 5000 N] and capable of being read to the nearest 5 lbf (20 N).

6.3 *Load Application and Support Blocks*—The supports for the specimens shall be of the rocker type (Fig. 1) with the edges at least as long as the width of the specimen. The load application block may be of either the rocker or rigid type. The portions of the load application and support blocks contacting the specimen shall be rounded, with a nominal radius of 1/2 in. [13 mm].

7. Conditioning

7.1 Dry the specimens for 48 h in a ventilated oven (meeting the requirements of E145) at a temperature of 140 ± 4°F (60 ± 2°C). 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. After removing the specimens from the oven, cool them to room temperature in a desiccator prior to testing.

ROOFING SLATE BREAKING LOAD

8. Sampling, Test Specimens, and Test Units

8.1 Select the sample to represent a true average of the slate shingles under consideration and of the quality supplied to the market under the type designation to be tested. The sample may be selected by the purchaser, their authorized representative, or the producer, from shingles fabricated from the quarried stone and shall be of adequate size to permit the preparation of the desired number of test specimens.

8.2 Not less than ten specimens 4 in. [100 mm] in width, 5 in. [125 mm] or greater in length and minimum 3/16 in. [5 mm]