



Designation: C 503 – 99<sup>ε1</sup>

## Standard Specification for Marble Dimension Stone (Exterior)<sup>1</sup>

This standard is issued under the fixed designation C 503; 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.

<sup>ε1</sup> NOTE—An editorial change was made in Table 1 in July 2000.

### 1. Scope

1.1 This specification covers the material characteristics, physical requirements, and sampling appropriate to the selection of marble for general (exterior) building and structural purposes.

1.2 Dimension marble shall include stone that is sawed, cut, split, or otherwise finished or shaped and shall specifically exclude molded, cast, or otherwise artificially aggregated units composed of fragments, and also crushed and broken stone.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

C 97 Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone<sup>2</sup>

C 99 Test Method for Modulus of Rupture of Dimension Stone<sup>2</sup>

C 119 Terminology Relating to Dimension Stone<sup>2</sup>

C 170 Test Method for Compressive Strength of Dimension Stone<sup>2</sup>

C 241 Test Method for Abrasion Resistance of Stone Subjected to Foot Traffic<sup>2</sup>

C 880 Test Method for Flexural Strength of Dimension Stone<sup>2</sup>

C 1353 Test Method Using the Taber Abraser for Abrasion Resistance of Dimension Stone Subjected to Foot Traffic<sup>2</sup>

### 3. Terminology

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

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee C-18 on Dimension Stone and is the direct responsibility of Subcommittee C18.03 on Material Specifications.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 04.07.

3.1.1 *marble, n*—a crystalline rock composed predominantly of one or more of the following minerals: calcite, dolomite, or serpentine and capable of taking a polish (see Terminology C 119).

### 4. Classification

4.1 Dimension marble (exterior) is classified as follows:

4.1.1 *I Calcite.*

4.1.2 *II Dolomite.*

4.1.3 *III Serpentine.*

4.1.4 *IV Travertine.*

### 5. Physical Properties

5.1 Marble supplied under this specification shall conform to the physical requirements prescribed in Table 1.

5.2 Marble for exterior use shall be sound, durable, and free of spalls, cracks, open seams, pits, or other defects that are likely to impair its structural integrity in its intended use.

5.3 The desired color and texture, with their permissible natural variations in material characteristics for all material to be produced for the project, shall be established by control samples. Select representative samples by viewing a sufficient number of physical samples prior to production that show the complete range of variations in color and texture of the marble specified.

### 6. Sampling

6.1 Samples, if required, for testing to determine the characteristics and physical properties shall be representative of the marble to be used.



**TABLE 1 Physical Requirements**

Physical Property	Test Requirements	Classification(s)	Test Method(s)
Absorption by weight, max, %	0.20	I, II, III, IV	C 97
Density, min, lb/ft <sup>3</sup> (kg/m <sup>3</sup> )	162 (2595)	I Calcite <sup>A</sup>	C 97
	175 (2800)	II Dolomite <sup>A</sup>	
	168 (2690)	III Serpentine <sup>A</sup>	
	144 (2305)	IV Travertine <sup>A</sup>	
Compressive strength, min, psi (MPa)	7500 (52)	I, II, III, IV	C 170
Modulus of rupture, min, psi (MPa)	1000 (7)	I, II, III, IV	C 99
Abrasion resistance, min, hardness <sup>B,C,D</sup>	10	I, II, III, IV	C 241/C 1353
Flexural strength, min, psi (MPa)	1000 (7)	I, II, III, IV	C 880

<sup>A</sup>See Terminology C 119 for definitions of calcite, dolomite, serpentine, and travertine marbles.

<sup>B</sup>Pertains only to stone subject to foot traffic. Where two or more marbles are combined for color and design effects, there should be no greater difference than five points in abrasion resistance.

<sup>C</sup>The supplier of the No. 60 Alundum abrasive, Norton, has indicated that the formula for Norton treatment 138S has been changed. The new abrasive is currently more aggressive, resulting in lower abrasive hardness values (H<sub>a</sub>) than when the standard was initially established. As such, care should be taken when interpreting H<sub>a</sub> values from tests using the new abrasive, particularly with regard to current ASTM stone standard specification requirements for abrasion resistance, which were developed when the original abrasive was still in use. Committee C-18 is actively studying alternatives to address this issue.

<sup>D</sup>Abrasion Resistance Test Method C 1353 will eventually replace Test Method C 241 and it is not necessary to perform both tests. Availability of the proper equipment and materials by the testing laboratory may determine which test is performed.

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