



Designation: **C503/C503M—15 C503/C503M – 22**

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

This standard is issued under the fixed designation C503/C503M; 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 reappraisal. A superscript epsilon (ε) indicates an editorial change since the last revision or reappraisal.

### 1. Scope

1.1 This specification covers the material characteristics, physical requirements, and sampling appropriate to the selection of marble for general building and structural purposes. Refer to Guides **C1242** and **C1528** for the appropriate selection and use of marble dimension stone.

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

1.3 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.

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

### 2. Referenced Documents

<https://standards.iteh.ai/catalog/standards/sist/02b77ef4-9191-468b-9e11-49051a8195fc/astm-c503-c503m-22>

#### 2.1 ASTM Standards:<sup>2</sup>

- C97/C97M** Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone
- C99/C99M** Test Method for Modulus of Rupture of Dimension Stone
- C119** Terminology Relating to Dimension Stone
- C170/C170M** Test Method for Compressive Strength of Dimension Stone
- C241/C241M** Test Method for Abrasion Resistance of Stone Subjected to Foot Traffic
- C880/C880M** Test Method for Flexural Strength of Dimension Stone
- C1242** Guide for Selection, Design, and Installation of Dimension Stone Attachment Systems
- C1353** Test Method for Abrasion Resistance of Dimension Stone Subjected to Foot Traffic Using a Rotary Platform Abraser
- C1528** Guide for Selection of Dimension Stone

### 3. Terminology

3.1 *Definitions*—All definitions are in accordance with Terminology **C119**.

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

Current edition approved Dec. 1, 2015; Aug. 1, 2022. Published January 2016; September 2022. Originally approved in 1962. Last previous edition approved in 2010 as **C503/C503M—10**; **C503/C503M – 15**. DOI: 10.1520/C0503-C0503M-15-10.1520/C0503-C0503M-22.

<sup>2</sup> 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.



4. Classification

4.1 Dimension marble is classified as follows:

4.1.1 *I Calcite.*

4.1.2 *II Dolomite.*

NOTE 1—See Terminology C119 for definitions of calcite and dolomite.

5. Soundness

5.1 Marbles are further classified into four “Soundness” groups: A, B, C, and D. Classifications are based on the properties encountered in fabrication and has no reference whatsoever to comparative merit or value. Marble is classified by its producer.

5.2 The Soundness classifications indicate what repairs may be necessary prior to or during installation, based on standard trade practices.

5.3 The groupings A, B, C, and D, should be taken into account when specifying marble, for all marbles are not suitable for all building applications. This is particularly true of the comparatively fragile marbles classified under Soundness Groups C and D, which may need additional fabrication before or during installation. Only Soundness Group A marble should be used for exterior installations, or any applications that require the stone panel to resist lateral loads or to bear weight without reinforcement.

5.3.1 The four groups are:

*Group A*—Sound marbles with uniform and favorable working qualities; containing no geological flaws, voids, spalls, cracks, open seams, pits or other defects.

*Group B*—Marble similar in soundness to Group A, but with less favorable working qualities; may have some minor small holes or voids that may require a limited amount of one or more of the following: waxing<sup>3</sup>, sticking<sup>4</sup>, and filling<sup>5</sup>.

*Group C*—Marble with some variations in working qualities; geological flaws, voids, and lines of separation are common. It is standard practice to repair these variations by one or more of the following methods: waxing<sup>3</sup>, sticking<sup>4</sup>, filling<sup>5</sup>, cementing, or other forms of additional reinforcement.

*Group D*—Marbles similar in soundness to Group C, but containing a larger proportion of natural faults, maximum variations in working qualities, and requiring more of the same methods of finishing.<sup>6</sup>

TABLE 1 Physical Requirements

NOTE 1—The values in Table 1 were established using samples prepared according to the individual test methods. Finishes, other than those specified in the individual test methods, may result in a deviation from established values.

Physical Property	Test Requirements	Classification(s)	Test Method(s)
Absorption by weight, max, %	0.20	I, II	C97/C97M
Density, min, lb/ft <sup>3</sup> (kg/m <sup>3</sup> )	162 [2600]	I Calcite <sup>A</sup>	C97/C97M
	175 [2800]	II Dolomite <sup>A</sup>	C97/C97M
Compressive strength, min, psi (MPa)	7500 [52]	I, II	C170/C170M
Modulus of rupture, min, psi (MPa)	1000 [6.9]	I, II	C99/C99M
Abrasion resistance, min, H <sub>a</sub> <sup>B,C</sup>	10	I, II	G241/G241M/G1353
Abrasion resistance, min, H <sub>a</sub> <sup>B</sup>	10	I, II	C241/C241M/C1353
Flexural strength, min, psi (MPa)	1000 [6.9]	I, II	C880/C880M

<sup>A</sup> See Terminology C119 for definitions of calcite and dolomite.

<sup>B</sup> Pertains to light foot traffic only. On commercial or institutional stairways, floors, and platforms subject to heavy foot traffic, a minimum abrasion hardness of 12.0 is recommended. Where two or more marbles are combined for color and design effects, there should be no greater difference than 5 points in abrasion resistance.

<sup>C</sup> Abrasion Resistance Test Method C1353 will eventually replace Test Method C241/C241M. 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.

<sup>3</sup> Waxing refers to the practice of filling minor surface imperfections such as voids or sand holes with melted shellac, cabinetmaker’s wax or certain polyester compounds. It does not refer to the application of paste wax to make the surfaces shinier.

<sup>4</sup> Sticking describes the butt edge repair of a broken piece now generally done with dowels, cements or epoxies. The pieces are “stuck” together, thus “sticking.”

<sup>5</sup> Filling—voids, such as those which occur naturally in marble, can be filled with polyester compounds.

<sup>6</sup> A “liner” is usually a thin slab of stone cemented to the back of a piece of finished marble for reinforcing.