



Designation: **C616/C616M—15** C616/C616M – 22

## Standard Specification for Quartz-Based Dimension Stone<sup>1</sup>

This standard is issued under the fixed designation C616/C616M; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

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

1.2 Quartz-based dimension stone 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.

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

#### 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

**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 1968. Last previous edition approved in 2010 2015 as ~~C616/C616M—10~~ C616/C616M – 15. DOI: 10.1520/C0616-C0616M-15-10.1520/C0616-C0616M-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 Quartz-based dimension stone sandstone shall be classified according to the free silica content as follows:

4.1.1 *I Sandstone*, with 60 % minimum free silica content.<sup>3</sup>

4.1.2 *II Quartzitic Sandstone*, with 90 % minimum free silica content.

4.1.3 *III Quartzite*, with 95 % minimum free silica content.

## 5. Physical Properties

5.1 Quartz-based dimension stone supplied under this specification shall conform to the physical requirements in [Table 1](#).

5.2 Quartz-based dimension stone 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 quartz-based dimension stone specified.

## 6. Sampling

6.1 Samples, if required, for testing to determine the characteristics and physical properties shall be representative of the quartz-based dimension stone to be used.

## 7. Keywords

7.1 ashlar; Bluestone; Quartzite; Sandstone

[ASTM C616/C616M-22](https://standards.iteh.ai/catalog/standards/sist/a65b5df4-ec5a-43d4-a8ce-5a247f0a5539/astm-c616-c616m-22)

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**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.

Property	Test Requirements	Classifications	Test Method(s)
Absorption by weight, max, %	8	I Sandstone	C97/C97M
	3	II Quartzitic Sandstone	
	1	III Quartzite	
Density, min, lb/ft <sup>3</sup> [kg/m <sup>3</sup> ]	125 [2000]	I Sandstone	C97/C97M
	150 [2400]	II Quartzitic Sandstone	
	160 [2560]	III Quartzite	
Compressive strength, min, psi (MPa)	4000 [28]	I Sandstone	C170/C170M
	10000 [69]	II Quartzitic Sandstone	
	20000 [140]	III Quartzite	
Modulus of rupture min, psi (MPa)	350 [2.4]	I Sandstone	C99/C99M
	1000 [6.9]	II Quartzitic Sandstone	
	2000 [13.8]	III Quartzite	
Abrasion resistance, min $H_a^{A,B}$	$\frac{2^C}{8}$	I Sandstone	C241/C241M/C1353- C241/C241M/C1353
Abrasion resistance, min $H_a^A$	$\frac{2^B}{8}$	I Sandstone	
	8	II Quartzitic Sandstone	
	8	III Quartzite	

<sup>A</sup> Pertains only to stone subject to foot traffic.

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

<sup>C</sup> Not recommended for paving in areas subject to heavy foot traffic.

<sup>3</sup> Free silica consists of detrital quartz grains plus authigenic silica.