



Designation: C 1526 – 02₃

Standard Specification for Serpentine Dimension Stone¹

This standard is issued under the fixed designation C 1526; 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.

1. Scope

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

1.2 Dimension serpentine 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 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 ~~Oct. 10, 2002~~; Dec. 1, 2003. Published ~~November~~ January 2004. Originally approved in 2002. Last previous edition approved in 2002 as C 1526 – 02.

2. Referenced Documents

2.1 ASTM Standards:²

- C 97 Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone
- C 99 Test Method for Modulus of Rupture of Dimension Stone
- C 119 Terminology Relating to Dimension Stone
- C 170 Test Method for Compressive Strength of Dimension Stone
- C 241 Test Method for Abrasion Resistance of Stone Subjected to Foot Traffic
- C 880 Test Method for Flexural Strength of Dimension Stone
- C 1353 Test Method for Abrasion Resistance of Stone Subjected to Foot Traffic by the Taber Abrader Method

3. Terminology

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

4. Physical Properties

- 4.1 Serpentine supplied under this specification shall conform to the physical requirements prescribed in Table 1.
- 4.2 Serpentine shall be free of minerals that may cause objectionable staining under normal environments of use.
- 4.3 Warping of serpentine due to localized water absorption is a natural characteristic of the material and shall be taken into account in assessing the permissible natural variations suitable for a particular application. Setting serpentine with a non-water-based setting material in a full-coverage setting bed over a rigid substrate can prevent warping from occurring after installation.
- 4.4 Alteration of the color and finish of serpentine with exposure to the weather can occur and shall be taken into account in assessing the suitability of serpentine for a particular application. Alteration of serpentine, due to weather exposure, can result in whitish mineral deposits on the surface of the stone and can also result in a faded appearance and loss of polish.
- 4.5 The desired color and texture, with their permissible natural variations in material characteristics for material to be produced for the project, shall be established by control samples. Representative samples shall be selected prior to production by viewing a sufficient number of samples that show the complete range of variations in color and texture of the serpentine specified.

5. Sampling

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

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.

TABLE 1 Physical Requirements

NOTE—The material property 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 | Classifications | Test Methods |
|---|-------------------|-----------------|--------------|
| Absorption by weight, max, % | 0.20 | I Exterior | C 97 |
| | 0.60 | II Interior | |
| Density, min, lb/ft ³ (kg/m ³) | 160 (2560) | I, II | C 97 |
| Compressive strength, min, psi (MPa) | 10000 (69) | I, II | C 170 |
| Modulus of rupture, min, psi (MPa) | 1000 (6.9) | I, II | C 99 |
| Abrasion resistance, min, $H_a^{A,B,C}$ | 10 | I, II | C 241/C 1353 |
| Flexural strength, min, psi (MPa) | 1000 (6.9) | I, II | C 880 |

^A Pertains to foot traffic only. Where two or more stone varieties are combined for color and design effects, there should be no greater difference than five points in abrasion resistance.

^B 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 abrasion resistance values (H_a) than when the standard was initially established. As such, care should be taken when interpreting H_a 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.

^C 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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