Designation: C 466 – 03

Standard Specification for Chemically Setting Silicate and Silica Chemical-Resistant Mortars[1]

This standard is issued under the fixed designation C 466; 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 requirements for chemically setting silicate and silica chemical-resistant mortars for bonding chemical-resistant masonry units.

NOTE 1—For information on the use of these materials, see Practice C 397.

2. Referenced Documents

2.1 *ASTM Standards:* [2]

C 279 Specification for Chemical-Resistant Masonry Units
C 321 Test Method for Bond Strength of Chemical-Resistant Mortars
C 397 Practice for Use of Chemically Setting Chemical-Resistant Silicate and Silica Mortars
C 413 Test Method for Absorption of Chemical-Resistant Mortars, Grouts, and Monolithic Surfacings
C 414 Test Method for Working, Setting and Curing Times of Chemically Setting Chemical-Resistant Silicate and Silica Mortars
C 531 Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes
C 579 Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes
C 580 Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes
C 904 Terminology Relating to Chemical-Resistant Nonmetallic Materials

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms used in this standard specification , see Terminology C 904.

4. Types of Mortars

4.1 *Single and Multicomponent*:

4.1.1 A single component mortar consists of a binder powder, a setting agent, and a chemically inert solid filler(s) to which potable water is added to make a trowelable mortar.

4.1.2 A multicomponent mortar consists of a binder liquid, a powder containing a setting agent, and a chemically inert solid filler(s) which are combined to form a trowelable mortar.

4.1.3 Some single and multicomponent mortars may permit the addition of a properly graded, high-purity silica sand in accordance with the manufacturer's recommendation.

5. Chemical Composition

5.1 The setting agent generally used is an acid compound that reacts with the silicate binders, or an alkaline compound that reacts with the silica sol binder, to form an insoluble silica gel. The filler materials shall be selected to have resistance to the particular chemicals to which they will be exposed. The service limitations of the filler shall be defined by the manufacturer.

6. Physical Requirements

6.1 Chemically setting silicate or silica chemical-resistant mortars prepared from these materials shall conform to the respective physical requirements prescribed in Table 1.

7. Performance Requirements

7.1 The liquid binder shall be of a viscosity that will permit it to be readily mixed manually with the filler. The filler shall have properly graded particles that will permit the preparation of a joint thickness of ⅛ in. (3.2 mm).

8. Test Methods

8.1 The properties enumerated in this specification shall be determined in accordance with the following methods:

8.1.1 *Bond Strength*—Test Method C 321. Brick described in Specification C 279 shall be used in this test.

8.1.2 *Absorption*—Test Method C 413.

8.1.3 *Working Life and Setting Times*—Test Method C 414.

[1] This specification is under the jurisdiction of ASTM Committee C03 on Chemical-Resistant Nonmetallic Materials and is the direct responsibility of Subcommittee C03.02 on Mortar and Monolithics.

Current edition approved Oct. 10, 2003. Published December 2003. Originally approved in 1961. Last previous edition approved in 1997 as C 466 – 97.

[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

Property	Type of Mortar		
	Sodium Silicate	Potassium Silicate	Silica
Bond strength, min, 7 days, psi (MPa)	80 (0.5)	150 (1.0)	80 (0.5)
Absorption, max, weight %	18.0	19.0	15.0
Working life, minimum, at 73°F (23°C), minutes	15	20	15
Shrinkage, max, 7 days at 73 ± 4°F (23 ± 2°C), %	1.0	3.0	—
Compressive strength, min, 7 days, psi (MPa)	1400 (9.6)	3000 (20.7)	3500 (24.1)
Flexural strength, min, 7 days, psi (MPa)	500 (3.4)	600 (4.1)	900 (6.2)

8.1.4 *Shrinkage*—Test Method C 531.
8.1.5 *Compressive Strength*—Test Methods C 579.
8.1.6 *Flexural Strength*—Test Method C 580.

9. Packaging and Package Marking

9.1 Single component mortars shall be packaged properly to prevent deterioration in storage.

9.2 For multicomponent mortars, the binder liquid shall be packaged in suitable containers and marked to denote the type of silicate or silica solution. The powder shall be packaged properly to prevent deterioration in storage.

10. Keywords

10.1 masonry units; chemical-resistant; mortars; chemical resistant; mortars; potassium silicate; mortars; silica; mortars; sodium silicate