



# Standard Specification for Chemical-Resistant Resin Mortars<sup>1</sup>

This standard is issued under the fixed designation C 395; 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.

*This standard has been approved for use by agencies of the Department of Defense.*

## 1. Scope

1.1 This specification covers the requirements for chemical-resistant resin mortars for bonding chemical-resistant brick or tile. Mortars of this group generally have better physical properties and resist a wider variety of chemicals than inorganic mortars. For the use of these materials, see Practice C 399.

NOTE 1—Resin mortars and grouts are differentiated as follows: resin mortars are troweled onto the brick or tile, in sufficient quantity to achieve a 1/8-in. (3-mm) thick joint after the brick or tile are laid in place (buttering or bricklayer's method). Resin grouts are applied to the joints, generally 1/4 in. (6 mm) wide, after the brick or tile are set in place and the setting bed has hardened (grouting or tilesetter's method). Refer to Specification C 658.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

## 2. Referenced Documents

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

- C 267 Test Methods for Chemical Resistance of Mortars, Grouts, and Monolithic Surfacing and Polymer Concretes
- C 279 Specification for Chemical-Resistant Masonry Units

<sup>1</sup> 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 Monolithics, Grouts and Polymer Concretes.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

- C 307 Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacing
- C 308 Test Methods for Working, Initial Setting, and Service Strength Setting Times of Chemical-Resistant Resin Mortars
- C 321 Test Method for Bond Strength of Chemical-Resistant Mortars
- C 399 Practice for Use of Chemical-Resistant Resin Mortars
- C 413 Test Method for Absorption of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes
- C 531 Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes
- C 579 Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes
- C 658 Specification for Chemical-Resistant Resin Grouts for Brick or Tile
- C 904 Terminology Relating to Chemical-Resistant Non-metallic Materials

## 3. Terminology

3.1 *Definitions*—For definitions of terms, refer to Terminology C 904.

## 4. Types of Resins, Fillers, and Setting Agents

4.1 The liquid resin may be phenolic, furan epoxy, polyester, vinyl ester, or some other resinous material capable of forming a chemical-resistant mortar when mixed with a suitable setting agent and filler.

4.2 The fillers may be silica, carbon, or some other chemical-resistant material.

4.3 The setting agents may include amines, polyamides, peroxides, acids or other reactants. Setting agents may be supplied as a separate component to be incorporated into the

resin and filler at the time of mixing or may be supplied as a constituent of the filler.

## 5. Physical Properties

5.1 Resin mortars prepared from these materials shall conform to the respective physical requirements prescribed in **Table 1**.

## 6. General Requirements

6.1 The resin shall have a viscosity that will permit it to be readily mixed with the powder by manual methods. The filler materials shall have properly graded particles that will permit the preparation of a minimum joint thickness of 1/16 in. (1.6 mm).

## 7. Chemical Resistance

7.1 The chemical resistance of these mortars are best determined by use of Test Methods **C 267**. Specific recommendations for immersion service can usually be found in the manufacturer's literature, but direct consultation would be advisable when conditions are questionable.

## 8. Test Methods

8.1 Determine the properties enumerated in this specification in accordance with the following methods:

- 8.1.1 *Working Life and Setting Time*—Test Methods **C 308**.
- 8.1.2 *Tensile Strength*—Test Method **C 307**.
- 8.1.3 *Compressive Strength*—Test Method **C 579**.
- 8.1.4 *Bond Strength*—Test Method **C 321**. Use Type III brick, described in Specification **C 279** in this test.
- 8.1.5 *Chemical Resistance*—Test Methods **C 267**.
- 8.1.6 *Shrinkage*—Test Method **C 531**.
- 8.1.7 *Absorption*—Test Method **C 413**.

## 9. Rejection

9.1 The resin mortar may be rejected if it fails to meet any requirements of this specification.

## 10. Packaging and Package Marking

10.1 Each component shall be packaged to prevent deterioration in storage and shall be labeled in such a manner to indicate clearly the other components with which it is to be used.

10.2 The supplier, at his discretion and responsibility, may indicate on the package that the product contained therein meets the requirements of this specification.

## 11. Keywords

- 11.1 brick; chemical-resistant; mortar

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**TABLE 1 Physical Requirements**

Resin	Filler	Tensile Strength, min, psi (MPa)	Compressive Strength, min, psi (MPa)	Bond Strength, min, psi (MPa)	Working Time, Minutes, 73 ± 4°F (23 ± 2°C), min	Setting Time, max		Shrinkage, max (7 days at 73 ± 4°F (23 ± 2°C), %)	Maximum Absorption Limit, %
						Initial, h	Service Strength, days		
Furan	carbon	700 (5)	5000 (35)	150 (1)	10	6	7	1.0	1.0
Furan	silica	400 (3)	5000 (35)	150 (1)	10	6	7	1.0	1.0
Phenolic	carbon	800 (6)	4500 (31)	150 (1)	10	6	7	1.0	1.0
Phenolic	silica	400 (3)	6000 (41)	150 (1)	10	6	7	1.0	1.0
Polyester	carbon	1000 (7)	9000 (62)	150 (1)	10	6	7	1.5	1.0
Polyester	silica	1000 (7)	9000 (62)	250 (2)	10	6	7	1.5	1.0
Epoxy	carbon	1000 (7)	7000 (48)	250 (2)	10	6	7	0.5	1.0
Epoxy	silica	1000 (7)	7000 (48)	250 (2)	10	6	7	0.5	1.0
Vinylester	carbon	1000 (7)	9000 (62)	150 (1)	10	6	7	1.5	1.0
Vinylester	silica	1000 (7)	9000 (62)	250 (2)	10	6	7	1.5	1.0