



Standard Specification for Chemical-Resistant Resin Mortars¹

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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 C399.

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 C658.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

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:²

- C267 Test Methods for Chemical Resistance of Mortars, Grouts, and Monolithic Surfacing and Polymer Concretes
- C279 Specification for Chemical-Resistant Masonry Units
- C307 Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacing
- C308 Test Methods for Working, Initial Setting, and Service

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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.

Strength Setting Times of Chemical-Resistant Resin Mortars

- C321 Test Method for Bond Strength of Chemical-Resistant Mortars
- C399 Practice for Use of Chemical-Resistant Resin Mortars
- C413 Test Method for Absorption of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes
- C531 Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes
- C579 Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes
- C658 Specification for Chemical-Resistant Resin Grouts for Brick or Tile
- C904 Terminology Relating to Chemical-Resistant Nonmetallic Materials

3. Terminology

3.1 *Definitions*—For definitions of terms, refer to Terminology C904.

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.

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

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 C267. 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 C308.

8.1.2 *Tensile Strength*—Test Method C307.

8.1.3 *Compressive Strength*—Test Method C579.

8.1.4 *Bond Strength*—Test Method C321. Use Type III brick, described in Specification C279 in this test.

8.1.5 *Chemical Resistance*—Test Methods C267.

8.1.6 *Shrinkage*—Test Method C531.

8.1.7 *Absorption*—Test Method C413.

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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