



Standard Practice for Chemical-Resistant Resin Grouts for Brick or Tile¹

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1. Scope

1.1 This practice provides detailed information on the handling and proper use of chemical-resistant resin grouts for filling joints of chemical-resistant brick or tile such as those covered in Specification C 658.

NOTE 1—Resin grouts and mortars are differentiated as follows: Resin grouts are applied to joints, generally $\frac{1}{4}$ in. (6 mm) wide, after the brick or tile are set in place and the setting bed has hardened (grouting or tilesetter's method). Resin mortars are troweled onto the brick or tile in sufficient quantity to achieve a $\frac{1}{8}$ -in. (3-mm) thick joint after the brick or tile are laid in place (buttering or bricklayer's method). (See Practice C 399.)

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

- C 267 Test Methods for Chemical Resistance of Mortars, Grouts, and Monolithic Surfacing and Polymer Concretes
- C 398 Practice for Use of Hydraulic Cement Mortars in Chemical-Resistant Masonry
- C 399 Practice for Use of Chemical-Resistant Resin Mortars

¹ This practice 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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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.

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 used in this practice, see Terminology C 904.

4. Storage

4.1 When stated on the package, the manufacturer's recommendations should be followed. In all instances, storage should be in a dry place with containers tightly closed and away from open flames. Powder or resin that has become contaminated should not be used.

5. Apparatus

5.1 For hand mixing, use clean nonabsorbent pails or mortar boxes. Paddles, trowels, or spatulas are suggested mixing tools.

5.2 For power mixing, use suitable size mixing equipment, such as that shown in Fig. 1. Operate at speeds so as to prevent air entrapment.

6. Procedure

6.1 Mixing:

6.1.1 Condition and mix the grout in accordance with the manufacturer's specification. Mixed grout should be of uniform, smooth consistency, free of lumps, with as little entrapped air as possible. Clean equipment between batches to prevent buildup of partially set grout.

6.1.2 For hand mixing, measure the liquid component(s) into the mixing container, add the powder slowly, and mix thoroughly.

6.1.3 For power mixing, measure the liquid component(s) into the mixing container, add the powder slowly and mix thoroughly to ensure a uniform mix. Avoid excessive air entrapment. Follow the recommendations of 5.2.

6.1.4 Vary the batch sizes according to temperature. In hot weather, reduce batch sizes; in cold weather, batch sizes may be increased.



NOTE—These mechanical mixers are packaged in standard 5-gal pails which serve as the mixing drum. The mixers are available in various horsepower and rpm for mixing resin mortars, grouts and monolithics.

FIG. 1 Mechanical Mixers

6.1.5 In hot weather, the liquid component(s) of the grout may be cooled by partially immersing the container in an ice bath to extend the working life. Take care to ensure that the components are not contaminated with ice or water. Refrigeration may be used.

6.2 *Handling:*

6.2.1 When installing resin grouts at temperatures below 60°F (16°C) or above 90°F (32°C), special hardening systems or precautions may be required. Consult manufacturer for recommendations.

6.2.2 Discard mixed grout that has become unworkable.

6.3 *Setting Brick or Tile:*

6.3.1 Various materials such as paraffin wax or other compounds and methods of application are available from grout manufacturers to ensure that the resin grout does not adhere to the face of the brick or tile. It is imperative that only the face of the brick or tile be protected prior to placing into the setting bed. Care must be taken to ensure that wax is not applied to the brick or tile surface which is to be grouted.

6.3.1.1 When grouting with water-washable grouts, waxing the face of the brick or tile may not be required.

6.3.2 Consult the manufacturer for recommendations on the appropriate substrate, its preparation, and suitable setting beds for the substrate.

6.3.3 *Sand-Cement Setting Bed*—Set the brick or tile into a stiff, moist sand-cement setting bed as described in Practice C 398. The brick or tile is bedded and tamped just deeply enough to ensure full bedding and to permit leveling while maintaining ¼-in. (6-mm) wide joints. If necessary, rake excess sand-cement out of the joints in order to ensure full joint depth. Excess setting bed mortar in the joints or the use of spacer mixes is not permitted. After the bed has set, apply the grout to the cleaned joints. The grout manufacturer may recommend acid-washing the open joints with dilute acid such as hydrochloric (muriatic), sulfamic, or phosphoric, prior to grouting the open joints. If acid washing is used, thoroughly flush the area with potable water to ensure removal of any residual acid and allow joints to dry before grouting.

6.3.4 *Chemical-Resistant Setting Beds*—Set the brick or tile into a ⅛-in. (3-mm) thick layer of catalyzed thermosetting resin mortar and tamp to permit leveling while maintaining approximately ¼ in. (6 mm) wide joints. If service conditions

to which the floor will be subjected necessitate a full and continuous bed, back buttering of the brick or tile is required. Some systems may require a chemical-resistant membrane, depending upon the service conditions or the type of material being used.

6.4 Grouting Brick or Tile:

6.4.1 Grout the brick or tile after the bed has set.

6.4.2 The temperature of the substrate and materials should be 60 to 90°F (16 to 32°C). Setting time of resin grouts is a function of temperature, that is, the lower the temperature, the slower the set; the higher the temperature, the faster the set. Special hardening systems are available to hasten or retard the cure of resin grouts at various temperatures. Consult the grout manufacturer for details.

6.4.3 Mix the resin grout in accordance with the manufacturer's recommendation. Place the freshly mixed resin grout onto the surface of the previously set brick or tile and immediately spread and work the grout into the open joints with a rubber faced trowel.

6.4.4 To facilitate cleaning, it is important to leave as little resin grout as possible on the surface of the brick or tile.

6.5 Cleaning Grout from Brick or Tile:

6.5.1 Inspect floor to ensure that the grouted joints are sufficiently hard to permit cleaning of the floor. Remove paraffin wax or other compounds from surface of brick or tile using steam, hot water, or other methods recommended by the grout manufacturer.

6.5.2 When grouting with water-washable grouts, cleaning of floor must take place before grout sets, in accordance with the manufacturer's directions.

6.6 *Cleaning of Equipment*—Most grouts may be removed from equipment with soap and water or suitable solvents before the grouts begin to set.

6.6.1 **Warning**—Provide adequate ventilation and keep open flames away when flammable solvents are in use. Dispose of used solvents in accordance with applicable local government regulations.

7. Curing

7.1 Resin grouts are generally formulated to attain an initial set in 10 to 20 h at 73 ± 4°F (23 ± 2°C).

7.2 The freshly installed brick or tile should be protected from damage or contamination until the grout has attained its initial set. Keep all traffic, construction equipment, water, oil, grease, and similar contaminants, etc. away from the installation during the curing process.

8. Chemical Resistance

8.1 Specific recommendations should be obtained from the manufacturer. Chemical resistance of grout may be determined in accordance with Test Method **C 267**. If the floor is installed without an impervious membrane between the substrate and the brick or tile, the chemical resistance of the completed installation may be considerably less than that of the chemical resistant joint material. Penetration of chemicals may occur through the brick, tile, or joints that can cause degradation of substrate. In severe chemical service, the installation must be made utilizing a membrane between the brick or tile and the substrate. Installations may also be made utilizing the buttering method. (See Practice **C 399**.)

9. Keywords

9.1 brick mortar; chemical-resistant; membrane; resin grout; setting bed; tile grout

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