



Designation: C627 – 18 (Reapproved 2024)

Standard Test Method for Evaluating Ceramic Floor Tile Installation Systems Using the Robinson-Type Floor Tester¹

This standard is issued under the fixed designation C627; 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 test method covers the evaluation of ceramic floor tile installation systems, using the Robinson²-type floor tester.

1.2 This test method is intended solely for evaluating complete ceramic floor tile installation systems for failure under dynamic loads and not for evaluating particular characteristics of ceramic tile, such as abrasion resistance. This test method does not claim to provide meaningful results for other than evaluating complete ceramic floor tile installation systems.

1.3 The values stated in inch-pound units are to be regarded as the standard. The metric (SI) units in parentheses are for information only.

1.4 *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:³

C144 Specification for Aggregate for Masonry Mortar

C150 Specification for Portland Cement

¹ This test method is under the jurisdiction of ASTM Committee C21 on Ceramic Whitewares and Related Products and is the direct responsibility of Subcommittee C21.06 on Ceramic Tile.

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² Detailed working drawings of the an apparatus known to meet the requirements of this standard are available at a nominal cost from ASTM Headquarters. Order Adjunct No. [ADJC062701](#) or [ADJC062701-E-PDF](#) (digital version).

³ 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.

2.2 ASTM Adjuncts:

Robinson-type Floor Tester²
Deflection Gauge⁴

3. Summary of Test Method

3.1 This test method consists of preparing test assemblies that duplicate the type of installation under consideration, subjecting them to one or more tests on the Robinson floor tester, and evaluating the results in a prescribed manner. Description of the installation method must specifically include all variables, for example, the type of materials and mixture proportions of substratum, setting material, and tile grout; type of tile, installation technique, and cure.

4. Significance and Use

4.1 This test method provides a standardized procedure for evaluating performance of ceramic floor tile installations under conditions similar to actual specific usages. It can be used to make comparisons between customary basic installation methods, to establish the influence of minor changes in a particular installation method, and to judge the merit of proposed novel methods.

5. Apparatus

5.1 *Foundation for Tester*—The foundation for the tester shall consist of a minimum 4-ft by 4-ft (1220 mm by 1220 mm) square and 1-ft (300 mm) thick cement slab. The testing surface of this slab shall be smooth, level, and flat with the maximum deviation from a true plane not to exceed $\frac{1}{32}$ in. (0.8 mm). The foundation may be equipped for a bottom or top driven tester. Please see [X1.1](#) for construction details for a foundation using a bottom driven tester that has been known to meet the requirements of the test method.

5.2 *Tester*—The tester itself shall be a 150-lbs $\pm$ 5-lbs (68.1 kg $\pm$ 2.3 kg) carriage in the shape of an equilateral triangle. Three swivel caster wheels shall be equally spaced in a circle with 15-in. (381 mm) radius from the center and

⁴ Detailed working drawings for construction of a deflection gauge known to meet the requirements of this standard are available at nominal cost from ASTM Headquarters. Order Adjunct No. [ADJC062702](#) or [ADJC062702-E-PDF](#) (digital version).

fastened to the underside of the carriage at the intersection of the bisector of each angle and the 15-in. (381 mm) radius circle. The carriage shall be capable of supporting 750 lbs (340.5 kg) of additional weight, 250 lbs (113.5 kg) of auxiliary weights over each wheel. The auxiliary weight stacks shall be sufficiently secured to the carriage. Cutaway diagrams of a bottom-driven apparatus and of a top-driven apparatus are shown in Fig. 1. Please see X1.2 for construction details² for one example of a tester known to meet the requirements of the test method.

5.3 Drive—The tester shall be driven by a motor and speed reducer, variable speed drive, or equivalent, capable of rotating the carriage at $15 \text{ rpm} \pm 0.5 \text{ rpm}$ during testing. Drive transmittal shall be arranged in such a manner that the plane of travel and the elevation of the carriage are free to accommodate various types of test assemblies. The drive shaft (whether top or bottom driven tester) shall be equipped with a universal joint between the driveshaft and carriage to allow contact between the wheels and test panel at all times.

5.4 Revolution Counter or Timer—A revolution counter, capable of recording up to 1000 revolutions, or an automatic timing device which can be present to stop the tester.

5.5 Wheels—The wheels shall be attached to swivel casters with removable axles, equipped with grease fittings. All casters shall be of ball bearing construction. The wheels shall be 4 in. $\pm \frac{1}{8}$ in. (102 mm $\pm$ 3 mm) in diameter and $1\frac{3}{8}$ -in. $\pm \frac{1}{16}$ -in. (35 mm $\pm$ 1.6 mm) in width. The wheels shall be equipped with roller or ball bearings. Three sets of three wheels each are required, namely:

5.5.1 One set of soft rubber wheels with a 78 ± 3 Shore A durometer hardness,⁵

5.5.2 One set of hard rubber wheels with a 80 ± 3 Shore D durometer hardness,⁵ and

5.5.3 One set of steel wheels with a steel surface. The surface of the steel wheel shall be curved in such a way that the radius in the center is greater than the radius on the edge by approximately $\frac{3}{128}$ in. (0.6 mm). See Fig. 2.

5.6 Weights—750-lbs (340 kg) of auxiliary weights are required. Weights may be of any size or shape so long as they meet the requirements found in 5.2 and the loading schedule found in Table 1. Thirty 25-lb (11.5 kg) disk-shaped, 11-in. (280 mm) diameter bar bell weights have been known to work. Accuracy of the weights shall be $\pm 2\%$.

5.7 Deflection Gauge (optional)—A gauge accurate to 0.001 in. (0.025 mm) which may be inserted between the upper and lower sheet of a plywood base to measure the deflection of the base under the path of the wheels.

6. Test Panel Assemblies

6.1 The base upon which the tile are installed, the bonding medium, the type of tile mountings, the type of grout, and the type of tile used may be varied with the requirements of the test.

⁵ The wheels must be conditioned at $73.4^\circ\text{F} \pm 3.6^\circ\text{F}$ ($23^\circ\text{C} \pm 2^\circ\text{C}$) for a minimum of 24 hours prior to measuring the durometer hardness. Shore A and Shore D durometer hardness measurements shall be taken in the center of the wheel width prior to the wheel being placed into service on each test panel.

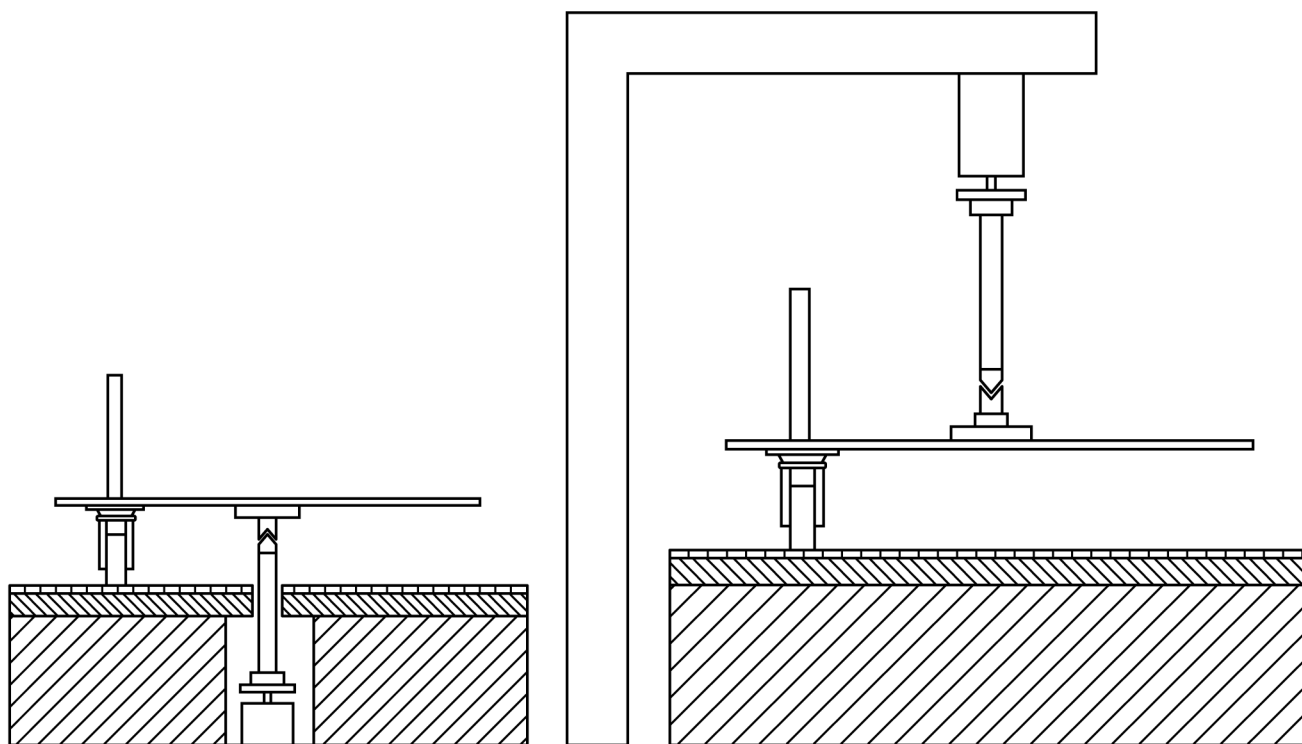


FIG. 1 Bottom- and Top-Driven Floor Tile Installations Systems Testers (Not to Scale)