



Designation: C307 – 03 (Reapproved 2012)

# Standard Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacing<sup>1</sup>

This standard is issued under the fixed designation C307; 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 U.S. Department of Defense.*

## 1. Scope

1.1 This test method covers the determination of tensile strength of cured chemical-resistant materials in the form of molded briquets. These materials include mortars, brick and tile grouts, machinery grouts, and monolithic surfacings. These materials shall be based on resin, silicate, silica, or sulfur binders.

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:*<sup>2</sup>

[C904 Terminology Relating to Chemical-Resistant Nonmetallic Materials](#)

[E4 Practices for Force Verification of Testing Machines](#)

## 3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms used in this test method, see Terminology [C904](#).

## 4. Significance and Use

4.1 It is recognized that chemical-resistant mortars, grouts, and monolithic surfacings are not usually under tension when

in service; however, such data are useful for purposes of determining the rate of cure and other properties.

4.2 This test method is not recommended for mortars, grouts, and monolithic surfacings containing aggregate greater than 1/4 in.

## 5. Apparatus

5.1 *Weighing Equipment*, shall be capable of weighing materials or specimens to  $\pm 0.3\%$  accuracy.

5.2 *Specimen Molds*—The molds for making briquet test specimens shall be sufficiently rigid to prevent deformation during molding and shall be made of corrosion-resistant material. Gang molds, when used, shall be of the type shown in [Fig. 1](#). The dimensions of the briquet molds shall be the width of the mold, between inside faces, at waist line of briquet, 1 in. The width and the depth of the briquet mold at the waist line shall be 1 in.  $\pm 0.02$  in. (25mm  $\pm 0.5$ mm). The molds shall conform to the dimensional requirements shown in [Fig. 2](#).

5.3 *Equipment for Mixing Materials*, shall consist of a container of suitable size, preferably corrosion resistant, and a strong, sturdy spatula, trowel, or mechanical mixer.

5.4 The following additional equipment is required for sulfur mortars.

5.4.1 *Melting Chamber*, of sufficient volume and heat capacity to melt the mortar sample and maintain the temperature of the melt between 260 and 290°F (127 and 143°C).<sup>3</sup>

5.4.2 *Laboratory Mixer*, of such a type and speed to be capable of lifting the aggregate without beating air into the melt.

5.4.3 *Ladle*, of sufficient capacity to completely pour one briquet.

5.5 *Testing Machine*, the testing machine shall be of any type sufficient to provide the required load and the rate of

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.46 on Industrial Protective Coatings.

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<sup>2</sup> 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.

<sup>3</sup> The sole source of supply of the Forney capping compound melting chamber, Model LA-0130, known to the committee at this time is Forney Industries, Inc., 1565 Broadway Ave., Hermitage, PA 16148. If you are aware of alternative suppliers, please provide this information to ASTM Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,<sup>1</sup> which you may attend.

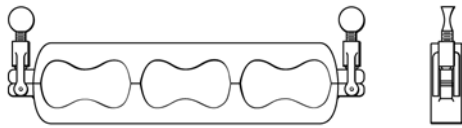


FIG. 1 Briquet Gang Mold

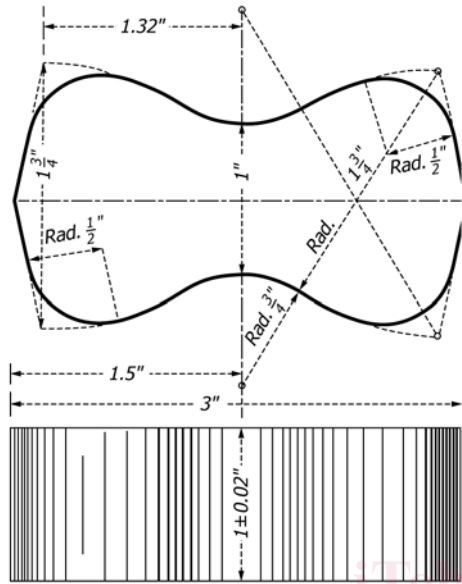


FIG. 2 Briquet Specimens for Tensile Strength Test

crosshead movement prescribed. It shall have been verified to have an accuracy of 1.0 % or better within 12 months of the time of use in accordance with Practices E4.

5.6 *Tension Clips*, for holding the tension test specimens, shall be in accordance with Fig. 3.

## 6. Test Specimens

6.1 All specimens for a single determination shall be made from a single mix containing sufficient amounts of the components in the proportions and in the manner specified by the manufacturer of the materials. If the proportions so specified are by volume, the constituents shall be weighed and the corresponding proportions by weight shall be reported.

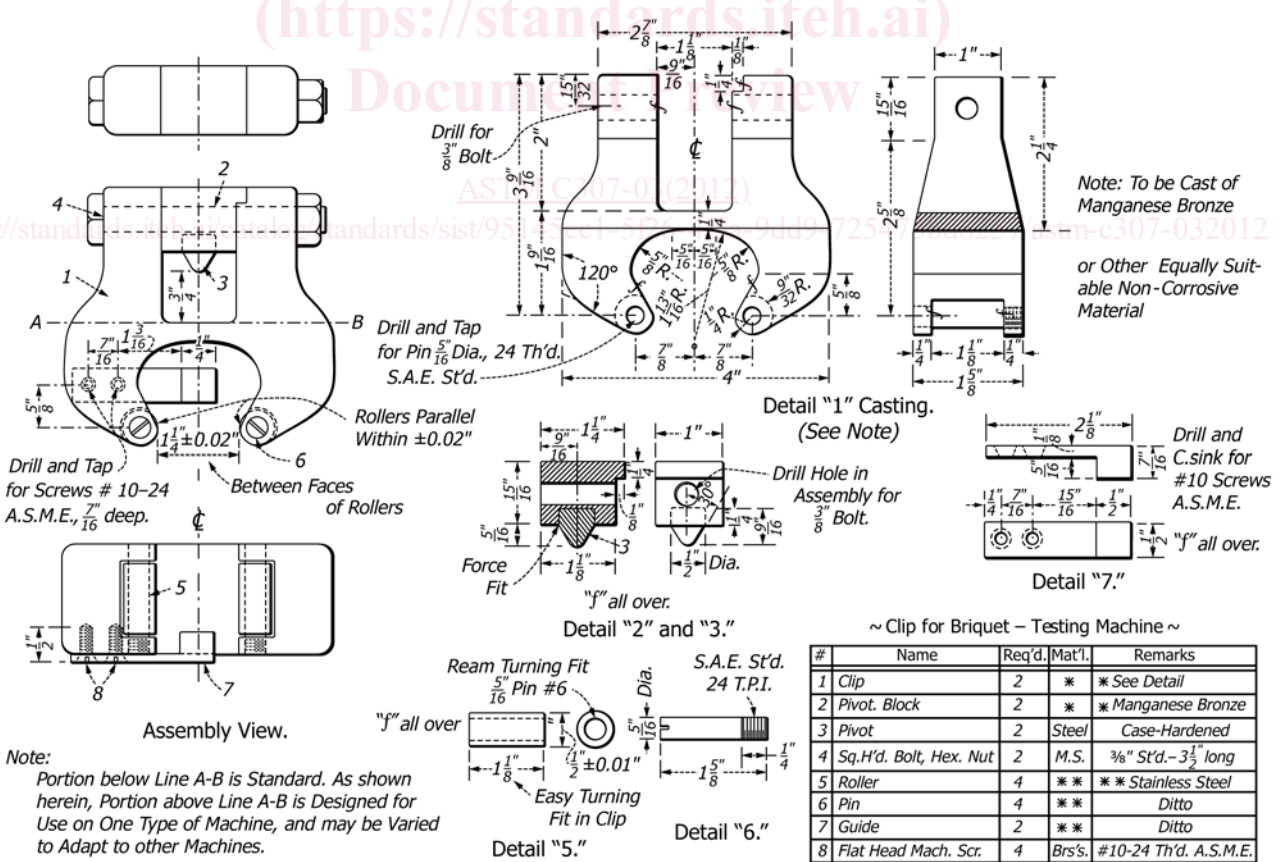
6.1.1 *Number of Specimens*—Prepare a minimum of six briquet specimens for each material tested.

### 6.2 Temperature:

6.2.1 *Resin, Silicate, and Silica Materials*—The standard temperature of the materials, molds apparatus, and the ambient temperature of the mixing area shall be  $73 \pm 4^\circ\text{F}$  ( $23 \pm 2^\circ\text{C}$ ). Record the actual temperature.

6.2.2 *Sulfur Mortars*—The material shall be maintained at  $275 \pm 15^\circ\text{F}$  ( $135 \pm 8^\circ\text{C}$ ). The temperature of the molds and the ambient temperature of the mixing area shall be  $73 \pm 4^\circ\text{F}$  ( $23 \pm 2^\circ\text{C}$ ). Record the actual temperature.

### 6.3 Molding Test Specimens:



1 in. = 25.4 mm

FIG. 3 Clips for Briquet Towing Machines