



Designation: **C419–08 (Reapproved 2013) C419 – 20**

Standard Practice for Making and Curing Test Specimens of Mastic Thermal Insulation Coatings¹

This standard is issued under the fixed designation C419; 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 practice covers the preparation of specimens of mastics and coatings in the form of cured sheets or films that ~~may be~~ are used in other procedures for evaluation of physical properties.

1.2 Three procedures are described for casting and curing (**Note 1**) mastics and coatings of all types for thermal insulation. When reinforcing mesh is recommended by the mastics and coatings manufacturer, test specimens shall be prepared using reinforcing mesh.

NOTE 1—The term “cure” is used primarily to denote the condition that develops as the result of loss of volatile matter but also to denote possible subsequent changes in chemical or physical properties due to crosslinking.

1.2.1 *Procedure A* is intended to provide a specimen of controlled thickness applied to ~~insulation, the intended insulation for field use and equivalent in other respects to that obtainable under field application conditions. The thermal insulation intended for field use may be specified as the backing.~~

1.2.2 *Procedure B* is intended to provide a free-film specimen of controlled thickness having smooth surfaces on both sides. This type is required for some types of physical testing.

1.2.3 *Procedure C* is intended to provide a free-film specimen of controlled thickness having one smooth surface (as field applied).

1.3 The procedures of this practice are not intended for the evaluation of application properties. These are covered in Test Methods **C461** and Guide **C647**.

1.4 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.

1.5 *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.*

1.6 *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:*²

C168 Terminology Relating to Thermal Insulation

C461 Test Methods for Mastics and Coatings Used With Thermal Insulation

C533 Specification for Calcium Silicate Block and Pipe Thermal Insulation

C647 Guide to Properties and Tests of Mastics and Coating Finishes for Thermal Insulation

D6/D6M Test Method for Loss on Heating of Oil and Asphaltic Compounds

3. Terminology

3.1 *Definitions*—For definitions used in this practice see Terminology **C168**.

¹ This practice is under the jurisdiction of ASTM Committee **C16** on Thermal Insulation and is the direct responsibility of Subcommittee **C16.33** on Insulation Finishes and Moisture.

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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.

4. Summary of Practice

4.1 Mastics and coatings are applied by a metal blade to thermal insulation backing material in a thickness regulated by guide bars. Moderate heat is applied to the specimens to dry or otherwise cure them.

5. Significance and Use

5.1 The method of preparation of test specimens of mastic thermal insulation coatings ~~can~~will have an impact upon values obtained during testing. Testing laboratories ~~should~~shall follow this practice to help ensure the reproducibility of test methods for which a cured sheet or film of a mastic thermal insulation coating is required.

6. Apparatus

6.1 *Guide Bars*—Two rectangular steel bars of thickness equal to the desired wet thickness of the applied mastic or coating. The guide bars shall be equal in length to the total length of the specimens. ~~For use on relatively soft backing material, the guide bars may be equipped with pins projecting from the lower surface at each end, which can be forced into the backing to hold the bars in position during preparation of the test specimen.~~ Guide bars with mechanical means of holding the bars in position during preparation of the test specimen such as projecting pins on the lower surface are helpful.

6.2 *Strike-Off Bar*—A flat strip of rigid metal, not less than 2 in. (51 mm) greater in length than the width of the specimen. One edge shall be smooth and straight.

6.3 *Leveling Roller*—One section of straight 1½-in. (38-mm) stainless steel pipe or any other convenient cylindrical leveling tool. The tool shall have a smooth surface. Minimum length shall be 2 in. (51 mm) longer than the width of the specimen.

6.4 *Backing Material*—Unless otherwise specified by the procedure for the test to be made, the backing for the specimen shall consist of commercial block-type calcium silicate insulation meeting the requirements of Specification **C533** and measuring 2 by 18 by 24 in. (51 by 457 by 610 mm). The backing block ~~may~~shall be prepared by assembling not more than three blocks of smaller dimensions by the use of suitable adhesive or pins, in such a manner as to form a solid, rigid block.

6.5 *Release Paper—Film*—A smooth, dense white paper coated on one side with dextrin, or other water-soluble gum. ~~Size should~~paper or film with a suitable non-soluble release surface such as PTFE or silicone. Size shall be approximately the same as the backing block.

~~NOTE 2—Films coated with PTFE or other suitable nonsoluble release agent may be used as an acceptable alternative.~~

7. Preparation of Test Specimens

7.1 Stir the mastic or coating until uniform throughout the container before removing the sample for specimen preparation.

7.2 Determine the percent volatile matter by weight in accordance with Test Methods **C461**, for use in calculating the degree of cure in **8.1.2**.

~~7.3 Unless otherwise specified, lay~~ Lay down films to specified nominal wet thickness of 0.125 in. (3.2 mm) thickness.

7.4 *Procedure A (Adhered Film)*—For the determination of degree of cure as described in **8.1.2**, prepare one extra specimen in addition to the number required by the other procedures in which they are to be used. If a primer or pretreatment of the block is specified, apply to the test specimen in accordance with the recommendations of the manufacturer of the mastic or coating. Place and secure guide bars of a thickness equal to the desired wet mastic thickness on the backing material along each of the long edges. Fill the area between the guide bars with mastic and smooth out with a trowel to a level about 0.063 in. (1.6 mm) above the guide bars. Place the strike-off bar upon the guide bars at one end of the filled area and move it slowly to the other end of the specimen, pushing the mastic along the surface of the backing. A see-sawing motion of the strike-off bar will be found to aid in uniform distribution of the mastic. As the mastic is distributed, take care to prevent inclusion of air pockets. Move the strike-off bar from end to end of the specimen in both directions, removing the excess material and filling the depressions, until a coat of uniform thickness extending from end to end of the specimen covers the entire space between the guide bars. Remove the guide bars without disturbing the wet specimen.

7.5 *Procedure B (Free Film)*—For the determination of degree of cure as described in **8.1.2**, prepare one extra specimen in addition to the number required by the other procedures in which they are to be used. Place a sheet of the release paper/film on the backing block or other suitable hard smooth surface so that the ~~coated surface of the paper~~ release surface faces upward, away from the backing block. Place and secure guide bars of thickness equal to the desired wet mastic thickness on the release paper/film along each of the long edges. Fill the area between the guide bars with mastic and smooth out with a trowel to a level about 0.063 in. (1.6 mm) above the guide bars. Place on the freshly applied mastic another sheet of release paper/film with the ~~coated~~ release surface facing the mastic, in the following manner: Place a short edge of the ~~coated paper~~ release film at one end of the mastic-filled area and gradually roll the paper/film into the wet mastic, using the leveling roller. Take care to prevent formation of air pockets, or bubbles, under the paper/film. When firmly in contact with the mastic, roll out the paper-covered/film-covered mastic until its