



Standard Test Method for Density and Dimensions of Preformed Pipe-Covering-Type Thermal Insulation¹

This standard is issued under the fixed designation C 302; 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 determination of the dimensions and density, after conditioning, of preformed pipe insulation.

1.1.1 Procedure 1 is applicable to sections of one-piece pipe covering or to sections of segmental pipe covering that can be joined together concentrically and measured as one-piece.

1.1.2 Procedure 2 is applicable to segmental pipe covering where each section of material is measured.

1.1.3 Procedure 3 is applicable to sections of one-piece pipe covering, such as soft foam or mineral wool materials, where it is possible to penetrate the material.

1.2 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

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:

C 167 Test Methods for Thickness and Density of Blanket or Batt Thermal Insulations²

C 168 Terminology Relating to Thermal Insulating Materials²

C 670 Practice for Preparing Precision and Bias Statements for Test Methods for Construction Materials³

C 870 Practice for Conditioning of Thermal Insulating Materials²

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method⁴

3. Terminology

3.1 *Definitions*—See Terminology C 168.

¹ This test method is under the jurisdiction of ASTM Committee C-16 on Thermal Insulation and is the direct responsibility of Subcommittee C16.32 on Mechanical Properties.

Current edition approved Aug. 15, 1995. Published October 1995. Originally published as C 302 – 52 T. Last previous edition C 302 – 82 (Reapproved 1989) ϵ^1 .

² *Annual Book of ASTM Standards*, Vol 04.06.

³ *Annual Book of ASTM Standards*, Vol 04.02.

⁴ *Annual Book of ASTM Standards*, Vol 14.02.

4. Summary of Test Method

4.1 The material to be tested is conditioned to constant weight. The density of the pipe insulation is calculated from the conditioned mass and measured dimensions.

5. Significance and Use

5.1 Density measurements of preformed pipe insulation are useful in determining compliance of a product with specification limits and in providing a relative gage of product weights. For any one kind of insulation some important physical and mechanical properties, such as thermal conductivity, heat capacity, strength, etc., bear a specific relationship with its density; however, on a density basis, these properties are not directly comparable with those for other kinds of material.

5.2 The physical dimensions of preformed pipe insulation are important quantities not only for determining the density of the pipe insulation but also for determining the conformance to specifications. The use of multilayer insulations is common, and the dimensions are necessary to ensure proper nesting of the layers.

6. Apparatus

6.1 *Flexible Steel Rule*, graduated in $\frac{1}{32}$ -in. or 1.0-mm intervals.

6.2 *Scale*, with sufficient capacity to weigh the specimen to within 0.01 lb or 5 g.

6.3 *Pin Probe*, as defined in Test Methods C 167.

6.4 *Steel Rule*, graduated in $\frac{1}{32}$ -in. or 1.0-mm intervals.

6.5 *Stainless Steel Shim Stock*, 2 in. (75 mm) wide, longer than the circumference of the pipe insulation, and 0.010 in. (0.25 mm) thick.

6.6 *Pi Tape*, graduated to read a diameter directly to the nearest $\frac{1}{32}$ in. or 1.0 mm.

6.7 *Pieces of Pipe*, on which to install the pipe insulation under test (only required for Procedure 3).

7. Test Specimen

7.1 The test specimen shall be of a commercial size.

7.2 If sectional pipe segments are to be used for Procedures 1 or 3, the sections shall be joined together to form a hollow cylinder.

8. Conditioning

8.1 Remove any jacket on the specimen unless it is of a type