



Designation: C1304 – 23

Standard Test Method for Assessing the Odor Emission of Thermal Insulation Materials¹

This standard is issued under the fixed designation C1304; 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 reappraisal. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reappraisal.

1. Scope

1.1 This test method covers a laboratory procedure for subjective determination of the existence, nature, and degree of odors present in all types of thermal insulation materials. This test method is not intended to evaluate the air quality aspects that any such odors may present.

1.2 The standard test condition for material evaluated under this test method is $149 \pm 1.8^\circ\text{F}$ ($65 \pm 1^\circ\text{C}$). Standard specifications referencing this test method may require other test conditions.

1.3 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.

1.4 *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:*²

C168 Terminology Relating to Thermal Insulation

3. Terminology

3.1 For definitions of terms related to this standard, see Terminology **C168**.

¹ This test method is under the jurisdiction of ASTM Committee **C16** on Thermal Insulation and is the direct responsibility of Subcommittee **C16.31** on Chemical and Physical Properties.

Current edition approved June 1, 2023. Published June 2023. Originally approved in 1995. Last previous edition approved in 2018 as C1304 – 18. DOI: 10.1520/C1304-23.

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. Significance and Use

4.1 Thermal insulating materials that produce objectionable odors could cause discomfort to persons occupying a structure insulated with such materials. Therefore, an examination to determine the odor potential of a particular insulation is desirable.

5. Apparatus

5.1 *Stainless Steel Containers or Glass Jars*, with all-metallic lids with air-tight seals are required. Containers shall not produce discernible odors of their own. The volume of the container shall be 2.5 to 3 times the volume of the test specimen. Transparent containers will be wrapped with aluminum foil to eliminate visual bias.

NOTE 1—See 6.2 for the minimum mass requirement for the test specimen, which influences test container volume.

5.2 *Oven*, capable of maintaining a temperature of $149 \pm 1.8^\circ\text{F}$ ($65 \pm 1^\circ\text{C}$).

5.3 *Odor Assessment Panel*, consisting of five persons who have demonstrated the ability to detect odors both accurately and consistently. A guideline for selection of panelists is given in *ASTM STP 758*.³

5.4 *Odor- and Draft-Free Area*, where the required oven is immediately accessible.

6. Sample Preparation

6.1 *Number of Tests*—Unless otherwise dictated by a specification standard, one specimen of the material is selected at random for testing. The sample shall be protected from contamination prior to testing. One empty container shall be used as a control for each sample tested.

6.2 *Specimen Size*—Test specimens shall have a minimum mass of 2 oz (57 g). Where applicable, the specimens shall be cut with a clean knife and tested at the full product thickness. If the product is faced, the facing shall remain as an integral part of the test specimen.

³ "Guidelines for the Selection and Training of Sensory Panel Members," *ASTM STP 758*, ASTM, 1981.

7. Procedure

7.1 The test containers shall be washed, thoroughly rinsed, and completely dried prior to use. Laboratory-grade powder detergent is satisfactory for this purpose. Be advised that other detergents could leave a residue that could bias the neutrality of the container.

7.2 Insert each specimen into a clean test container and replace the lid. Place the closed specimen containers and the identical empty control container for 30 ± 5 min in the oven controlled at $149 \pm 1.8^\circ\text{F}$ ($65 \pm 1^\circ\text{C}$).

7.3 The group of five panelists shall be assembled in the test area prior to tests. The panelists shall write their perceptions down rather than give verbal results that could bias the opinion of others. An individual questionnaire is provided to each panelist.

7.4 Panelists shall rate the control container prior to the test specimen container. The control container shall be rated either as having no perceptible odor or as having an odor rated as not objectionable and weak. If a greater odor than this is detected, the test is considered void, and new control and specimen containers shall be prepared.

7.5 Each member shall take the container, remove the lid, sniff the specimen for odor, replace the lid, and then pass the container to the next member in an expedient manner. The container shall be held at a distance of approximately 2 in. from the nose and shall be sniffed for a period of about 5 s. Panelists shall close their eyes to eliminate visual bias. The odor examination by all members shall be completed within 3 min or the specimen shall be placed back in the oven for 15 min before the evaluation is continued. The specimen cannot be heated a third time. If all panel members have not completed

their evaluation at the end of the second 3 min, discard and begin with a new specimen.

7.6 The questionnaire shall request answers to the following questions:

7.6.1 Was an odor perceptible?

7.6.2 Was the odor objectionable or otherwise?

7.6.3 Was the odor weak or strong?

8. Interpretation of Results

8.1 Any sample producing a detectable odor that is classified as objectionable and strong by more than two panel members shall be considered to have failed the test.

9. Report

9.1 A test report summarizing panel ratings shall be prepared, stating whether the material passed or failed.

9.1.1 Where possible, specify the manufacturer, product type, whether faced or unfaced, lot number, and production date.

9.1.2 Was a perceptible odor present? Yes _____. No _____. If Yes, continue to 9.1.3 and 9.1.4.

9.1.3 Odor was objectionable_____, otherwise _____.

9.1.4 Odor was weak _____, strong _____.

10. Precision and Bias

10.1 No statement is made about either the precision or bias for Test Method C1304 for measuring the odor emission of thermal insulation materials, since the test results are nonquantitative.

11. Keywords

11.1 odor; thermal insulation

ASTM International takes no position respecting the validity of any patent rights asserted in connection with any item mentioned in this standard. Users of this standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, are entirely their own responsibility.

This standard is subject to revision at any time by the responsible technical committee and must be reviewed every five years and if not revised, either reapproved or withdrawn. Your comments are invited either for revision of this standard or for additional standards and should be addressed to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee, which you may attend. If you feel that your comments have not received a fair hearing you should make your views known to the ASTM Committee on Standards, at the address shown below.

This standard is copyrighted by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, PA 19428-2959, United States. Individual reprints (single or multiple copies) of this standard may be obtained by contacting ASTM at the above address or at 610-832-9585 (phone), 610-832-9555 (fax), or service@astm.org (e-mail); or through the ASTM website (www.astm.org). Permission rights to photocopy the standard may also be secured from the Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923, Tel: (978) 646-2600; http://www.copyright.com/