Designation: C1806 – 21

Standard Test Method for Measuring the Flow Rate of Aerosol Foam Sealants[1]

This standard is issued under the fixed designation C1806; 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 describes a procedure for determining the flow rate of aerosol foam sealants.

1.2 Flow rate is determined in a controlled laboratory environment with manual dispensing (Method A) or using a flow rate machine (Method B).

1.3 Currently, two foam sealant types are applicable to this test method: single component polyurethane and latex.

1.4 There are no other known test methods specific for measuring the flow rate of aerosol foam sealants.

1.5 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.6 *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.*

1.7 *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]

C717 Terminology of Building Seals and Sealants

C1620 Specification for Aerosol Polyurethane and Aerosol Latex Foam Sealants

3. Terminology

3.1 *Definitions*——Refer to C717 for definitions of the following terms used in this terminology: sealant, aerosol foam; sealant, latex; aerosol container, empty; and standard laboratory conditions. Refer to Specification C1620 for definitions and classifications of aerosol foam sealants and latex foam sealants. Temperature and humidity are referenced from C1620.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *flow rate, n*—a unit of measurement expressed as grams per second (g/s).

3.2.2 *flow rate machine, n*—a testing machine that includes both a stationary and a moveable member (pneumatic piston). The machine must be capable of depressing the aerosol can valve at a consistent and repeatable pressure and do so for a consistent and repeatable duration for each test operation.

3.2.3 *mechanical test method, n*—the practice of using a testing machine to measure flow rate without an applicator or dispensing unit.

3.2.4 *non-mechanical test method, n*—the practice of using an applicator or dispensing unit to dispense the foam sealant product to measure flow rate by hand.

4. Summary of Test Method

4.1 *Procedure A-Non-mechanical Test Method:*

4.1.1 The contents of the aerosol foam or latex sealant are dispensed for a predetermined amount of time with consistent hand pressure on the applicator of the dispensing unit such that the aerosol can is fully activated.

4.1.2 The flow rate is calculated from the measured amount of foam dispensed and the net time to dispense the aerosol can.

4.2 *Procedure B-Mechanical Test Method:*

4.2.1 The aerosol sealant is dispensed for a predetermined amount of time with the same amount of pressure using a flow rate machine such that the aerosol can is in the fully activated position.

4.2.2 The flow rate is calculated from the measured amount of foam dispensed and the net time to dispense the aerosol can.

5. Significance and Use

5.1 This test method provides a calculated data point regarding the amount of foam dispensed at one time from a single can of foam at standard laboratory conditions or a specific temperature and relative humidity range.

[1] This test method is under the jurisdiction of ASTM Committee C24 on Building Seals and Sealants and is the direct responsibility of Subcommittee C24.61 on Aerosol Foam Sealants.

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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.

5.2 Flow Rate does not predict the performance capability of the foam sealant or its suitability for the intended application.

5.3 Flow Rate can be measured with a testing machine (Procedure B) or with the intended applicator or dispensing unit (Procedure A).

5.4 The test is suitable for product performance certification and quality control programs, and can be useful to the general public, aerosol foam sealant manufacturers, distributors, specifiers, architects, contractors, testing laboratories, and other businesses and professionals.

6. Apparatus

6.1 *Flow rate machine, dispensing unit, or applicator,* recommended for use with the aerosol foam or latex sealant.

6.2 *Calibrated Analytical Balance or scale,* capable of accurately weighing the specimens to the nearest 0.1 g.

6.3 *Timer or stop watch,* accurate to 1 s and fraction thereof.

7. Sampling and Test Specimens

7.1 The product to be measured shall be unopened.

7.2 A minimum of three cans shall be tested and their average flow rate determined.

7.3 Samples are to be randomly selected from the production lot.

7.4 Samples must be the final manufactured product for which recognition is sought.

8. Conditioning

8.1 Condition at least three cans of aerosol foam or latex sealant and dispensing mechanism at standard laboratory conditions or at desired temperature and relative humidity for a minimum of 24 h prior to testing.

9. Procedure A – Non-mechanical Test Method

9.1 Record the laboratory conditions as defined in Section 8.

9.2 Attach the dispensing mechanism. If the mechanism is meterable, adjust the flow control to full open.

9.3 Weigh the full can of foam sealant with attached dispensing mechanism and record as the start weight.

9.4 Shake the aerosol can vigorously for 30 s or as recommended in the product instructions.

9.5 Start the timer while dispensing the product fully activated for 10 s. Ensure the can does not fully empty during this time.

9.6 After dispensing for the 10 s duration, weigh the discharged aerosol can and record the end weight.

9.7 Repeat steps 9.1 – 9.6 for remaining sample cans of aerosol foam or latex sealants.

10. Procedure B – Mechanical Test Method

10.1 Record the laboratory conditions as defined in Section 8.

10.2 Weigh the full can of foam sealant without the cap and record as the start weight.

10.3 Shake the aerosol can vigorously for 30 s or as recommended in the product instructions.

10.4 Invert the aerosol can and place it in the stationary dye of the flow rate machine.

NOTE 1—Reset the spacing for different product sizes.

10.5 Activate the flow rate measurement machine. See Fig. 1. Ensure the can does not fully empty during this time.

10.6 After dispensing for the prescribed duration, weigh the discharge aerosol can and record the end weight.

10.7 Repeat steps 10.1 – 10.6 for remaining sample cans of aerosol foam or latex sealants.

11. Calculation or Interpretation of Results

11.1 Subtract the end weight from the start weight to obtain the total amount dispensed. Divide the amount dispensed by the activation time. Flow rate (g/s) = (start weight – end weight) / activation time.

11.2 Obtain the average flow rate for the sample test cans of aerosol foam or latex sealants.

12. Report

12.1 Complete name or designation of product tested.

12.2 Temperature and humidity of the environment at the time of dispensing.

12.3 Label statement of the size or contents of the aerosol in units of grams, weight ounces, or milliliters, etc.

12.4 Make and model of dispensing unit.

12.5 Testing agency and location.

12.6 Sample location and by whom.

12.7 Date of the initiation of the test.

12.8 Date of report.

12.9 Expiration date of product tested.

12.10 Record whether Procedure A or B was followed.

12.11 Average Flow Rate.

12.12 A statement that the test or tests were conducted in accordance with this test method.

13. Precision and Bias

13.1 No precision or bias have been developed for this test method.

14. Keywords

14.1 aerosol; aerosol foam; air infiltration; foam sealant; latex foam sealant; polyurethane foam sealant