



Designation: C1737 – 23

Standard Guide for Evaluating Temperature Effects to Aerosol Foam Sealant During and After Dispensing¹

This standard is issued under the fixed designation C1737; 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 guide covers the general effects of temperature from the aerosol foam sealant (either polyurethane or latex types) under the use temperatures.

1.2 The guide is intended to estimate the observed product dispensing characteristics and foam quality of aerosol foam dispensed or cured, or both, at specific temperatures and standard conditions.

1.3 Such foam sealants are primarily intended to reduce air movement in and out of building enclosures.

1.4 Currently two main foam sealant types are applicable to this standard: single component polyurethane and latex.

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 There are no other known test methods specific for measuring the product temperature range for aerosol foam sealant.

1.7 *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.*

1.8 *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.*

¹ This guide 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. Referenced Documents

2.1 *ASTM Standards:*²

C717 Terminology of Building Seals and Sealants

C1620 Specification for Aerosol Polyurethane and Aerosol Latex Foam Sealants

C1806 Test Method for Measuring the Flow Rate of Aerosol Foam Sealants

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *cure temperature*—set temperature of the chamber where the foam sealant cures. Also called the ambient air temperature for purposes of this guide.

3.1.2 *flow rate*—see Test Method C1806.

3.1.3 *friability*—the property of a cured or semi-cured foamed cellular material which permanently deforms and crumbles after a light finger force is applied to the material surface.

3.1.4 *product temperature*—temperature of the foam sealant in its original container after 24 h at the manufacturer's recommended test temperature.

3.1.5 *product use temperature*—the aerosol can product temperature itself and the ambient air temperature during the cure.

3.1.6 *standard conditions*—see Terminology in C717.

3.1.7 *tack free time*—see Specification C1620.

4. Summary of Guide

4.1 *Procedure*—Select the desired temperatures to measure. A product for example could be tested at a product temperature of 5 °C, and a cure temperature (ambient air temperature) of 0 °C. This comprises the product use temperature.

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.

4.1.1 Specimens from a completely filled aerosol container's are dispensed at specified size and as bead segments.

4.1.2 Product temperature is maintained at selected product temperature prior to testing at the selected cure temperature (which may be the same or different than the product temperature).

4.1.3 Foam products are evaluated for flow rate, tack free time, friability, and skin and cell appearance as described herein.

5. Significance and Use

5.1 This guide is not intended to measure the precise temperature range for dispensing and curing product under all the possible substrate and environmental factors but to provide a basis for benchmarking a foam sealant product under specific laboratory conditions.

5.2 The product user is encouraged to evaluate each application and determine suitability for actual use.

6. Apparatus

6.1 *Two test chambers*, capable of controlling temperature from $-15\text{ }^{\circ}\text{C}$ to $45\text{ }^{\circ}\text{C}$ within $\pm 2\text{ }^{\circ}\text{C}$.

7. Test Specimens and Substrates

7.1 Condition and prepare all test products at selected product conditions.

7.2 Condition and prepare all test substrates at selected curing conditions.

7.3 For each product tested it is essential to follow the manufacturer's label directions and to use the dispenser supplied with the product. One full aerosol can of product is needed for each test product use temperature.

7.4 Product shall be applied to smooth kraft brown wrapping paper, without coatings.³

8. Conditioning

8.1 Condition the full aerosol sealant foam sealant cans and substrates under standard conditions prior to the selected test chamber conditioning (see 9.1 and 9.2).

9. Procedure

9.1 Condition substrates at the selected cure temperature for 24 h.

9.2 Condition the full aerosol foam sealant cans at the selected product temperature for 24 h.

9.3 Weigh the full aerosol foam sealant can without the cap but with the dispensing mechanism attached and record the starting weight.

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

9.5 Immediately dispense a 1 cm diameter by 8 cm long foam sealant bead (or any desired test specimen size) onto the

Kraft Paper while the paper is in the curing test chamber. Close the door within 5 s of opening the curing chamber.

9.6 With an unopened separate foam sealant aerosol can conditioned at desired product temperature, measure flow rate in accordance with Test Method C1806.

9.6.1 Note the approximate flow rate time and quality of foam sealant flow relative to dispensing at $23\text{ }^{\circ}\text{C}$ with 1 (lowest flow) and 5 (highest flow), for example, (1 = no flow; 2 = very slow; 3 = normal (flow rate at $23\text{ }^{\circ}\text{C}$); 4 = fast; 5 = very fast) in data sheet.

9.7 After 2 h, open the curing chamber and check foam for friability and tack free by pressing into the foam with a nitrile or latex type surgical gloved finger. Close the door within 5 s.

NOTE 1—All measurements in 9.6 through 9.9 are based on internal standards created by the analyst for the specific product under test.

9.8 Recheck friability and tack free (see Specification C1620 for tack free) again in another hour by opening the curing chamber door for no more than 5 s.

9.9 After 24 h, do a final check for friability and tack free and remove the samples from the test chamber to standard conditions. Rank and average skin appearance from 1 (worst) – 5 (best) for all test specimens compared to skin appearance at standard conditions. Also cut through the final cured foam sealant specimens with a box cutter or sharp knife in two directions to evaluate the internal foam cell structure. Rank and average internal foam sealant cell structure for all specimens from 1 (worst) – 5 (best) as compared to skin appearance at standard conditions.

9.9.1 **Warning**—The opening and closing of the chamber door must be minimized during the test and between the second and the third hour as some foams lose the friability extremely fast as the temperature rises above a critical temperature even momentarily. It is desirable to run a recording temperature device that continuously monitors the temperature of the chamber.

9.10 Cut through the final cured foam sealant specimens with a box cutter or sharp knife in two directions to evaluate the internal foam cell structure. (See 10.10 for skin appearance ranking).

FRIABILITY TABLE 1		
Test Time Duration	YES	NO
Friable at 2 h		
Friable at 3 h		
Friable at 24 h		

TACK FREE TABLE 2		
Test Time Duration	YES	NO
Tack Free at 2 h		
Tack Free at 3 h		
Tack Free at 24 h		

OTHER DATA RANKING TABLE 3					
Test Rank	1	2	3	4	5
Relative Flow Rate					

10. Report

10.1 Complete name or designation of product tested.

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

³ Kraft paper – higher strength paper – termed “kraft paper” from manufacturing practice.