Designation: C1815 – 17 (Reapproved 2021)

Standard Practice for Periodically Measuring and Monitoring Sealant Dimensions to Stability Following a Period of Compression or Tension[1]

This standard is issued under the fixed designation C1815; 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 a procedure for measuring and monitoring the physical dimensions of an elastomeric joint sealant in a test specimen configuration described in Test Method C719 following a period of compression or tension. These sealant materials are typically highly filled elastic materials. The dimensional change of these sealant materials is determined by measuring the dimensions at specific intervals over a period of time.

1.2 The values stated in SI units are to be regarded as standard. The values given in parentheses after SI units are provided for information only and are not considered standard.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *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:*

C717 Terminology of Building Seals and Sealants

C719 Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle)

C1589 Practice for Outdoor Weathering of Construction Seals and Sealants

C1735 Test Method for Measuring the Time Dependent Modulus of Sealants Using Stress Relaxation

E631 Terminology of Building Constructions

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms used in this practice, refer to Terminologies E631 and C717.

4. Summary of Practice

4.1 This practice consists of monitoring the dimensional change of a sealant for a period of time required to establish dimensional stability.

4.2 The motivation for this practice is to monitor the dimensions of a sealant at any time, but especially after a period of extended tension or compression to establish the stable dimensions of that sealant. The latter is used in application of a standard, such as Test Method C1735, by using the accurate dimensions determined by this practice after dimensional stability is attained.

4.3 This practice will enable determination of the stable dimensions of a sealant. It will also allow the reporting of the time scale over which the sealant dimensions are changing.

5. Significance and Use

5.1 Many sealants have been observed to dimensionally change following a period of compression or tension, such as occurs during exposure in accordance with Practice C1589. It has been shown that for some sealants, increasing exposure to weathering increases the time required for dimensional stability and decreases the magnitude of dimensional change. Dimensional stability and knowledge of the stable sealant dimensions are critical to the accurate measurement of the sealant's modulus by a test such as Test Method C1735.

5.2 This practice will find application in improving the accuracy of the modulus determined by a standard such as Test Method C1735 by using the accurate dimensions determined by this practice after stability is attained.

6. Apparatus

6.1 *Dimensional Measuring Tool*—A micrometer, such as digital calipers, capable of measuring the dimensions of aluminum substrate and sealant to an accuracy of at least ±0.05 mm (±0.002 in.), is required. An accurate measurement of the geometry is critical. For example, for a 12.5 mm thick

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sealant that will experience a 15 % strain when tested in accordance with Test Method C1735, the total deflection is 1.875 mm. For measurement accuracy of 3 % of this value, measurement of ±0.05 mm is required.

NOTE 1—The members of C24.20 were able to measure the dimensions of three different sealants to a precision of ±0.05 mm using a digital micrometer.

7. Procedure

7.1 Measure the dimensions of the specimen at the standard conditions of temperature and relative humidity defined in Terminology C717. Measurements of the specimen dimensions at other ambient temperature and relative humidity conditions may be performed but should be reported in 8.1.4.

7.2 The test specimen shall be measured with a precision of ±0.05 mm in all three dimensions (width, height, and thickness).

7.2.1 The jaws of the geometry measuring tool described in 6.1 will be positioned at the midpoint of the width, or thickness of the sample. The jaws of the geometry measuring tool will be closed until the jaws make contact with the sealant. At this point, the dimensions indicated by the geometry measuring tool are recorded.

7.2.2 For the measurement of the height of the sample, the jaws of the dimensional measuring tool described in 6.1 will be positioned between the substrates. The jaws of the dimensional measuring tool will be opened until the jaws make contact with the metal supports of the sealant when the dimensional measuring tool is vertically aligned with the height of the sealant. At this point, the dimension indicated by the dimensional measuring tool is recorded.

7.2.3 This procedure will be repeated at regular intervals until three subsequent readings are equivalent within ±0.1 mm. Regular intervals would be determined to document how the sealant is changing.

8. Report

8.1 Report the following information:

8.1.1 Identification of the sealant measured, including type, source, manufacturer code number, and curing conditions employed.

8.1.2 Identification of the substrates measured.

8.1.3 Name and description of primers that were used, if any,

8.1.4 Temperature and relative humidity,

8.1.5 Number of specimens tested,

8.1.6 Description of the sealant appearance, and

8.1.7 Records in terms of dimensions as a function of time.

9. Keywords

9.1 compression; dimensional stability; recovery; sealant; tension;