



Designation: C919 – 12 (Reapproved 2017)

Standard Practice for Use of Sealants in Acoustical Applications¹

This standard is issued under the fixed designation C919; 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 provides information for the use of sealants to reduce sound transmission characteristics of interior walls, ceilings, and floors by proper application of sealants to joints, voids, and penetrations normally found in building construction, which are commonly referred to as “flanking paths.”

1.2 *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.*

1.3 The committee with jurisdiction over this standard is not aware of any comparable standards published by other organizations.

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:*²

- C634 Terminology Relating to Building and Environmental Acoustics
- C717 Terminology of Building Seals and Sealants
- C834 Specification for Latex Sealants
- C920 Specification for Elastomeric Joint Sealants
- C1193 Guide for Use of Joint Sealants
- C1520 Guide for Paintability of Latex Sealants
- C1620 Specification for Aerosol Polyurethane and Aerosol Latex Foam Sealants

¹ This practice is under the jurisdiction of ASTM Committee C24 on Building Seals and Sealants and is the direct responsibility of Subcommittee C24.10 on Specifications, Guides and Practices.

Current edition approved June 1, 2017. Published June 2017. Originally approved in 1979. Last previous edition approved in 2012 as C919 – 12. DOI: 10.1520/C0919-12R17.

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.

C1642 Practice for Determining Air Leakage Rates of Aerosol Foam Sealants and Other Construction Joint Fill and Insulation Materials

E90 Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

E336 Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings

E413 Classification for Rating Sound Insulation

2.2 HUD Standard:³

HUD Minimum Property Standards for Housing, Section 4910.1

2.3 IBC Standard:⁴

International Building Code (IBC), Section 1207

3. Terminology

3.1 *Definitions*—For definitions of terms used in this recommended practice, see Terminologies C717 and C634.

4. Significance and Use

4.1 Walls, ceilings, and floors in building construction, especially those that are of lightweight construction, and that are designed to reduce or limit sound transmission, can have undesirable sound transmission characteristics if care is not taken to seal joints, voids, and penetrations that typically occur. Unsealed joints, voids, and penetrations will substantially increase the sound transmission characteristics of these types of construction. By sealing them the transmission of sound can be substantially diminished by eliminating “flanking paths.”

5. Sound Transmission Requirements

5.1 The construction industry has adopted Sound Transmission Class (STC) units, as defined in Terminology C634, to rate the sound transmission properties of walls, ceilings, and floors. The STC is determined in accordance with Classification E413. The test data are obtained in accordance with Test Methods E90 and E336.

5.2 Various building and other governmental adopted codes include requirements for sound transmission.

³ Available from Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.

⁴ Available from International Code Council (ICC), 500 New Jersey Ave., NW, 6th Floor, Washington, DC 20001, http://www.iccsafe.org.

5.2.1 For example, the International Building Code (IBC), Section 1207, has requirements for the amount of sound that is allowed to be transmitted through the interior walls, partitions, and floor and ceiling assemblies between adjacent dwelling units and between them and public spaces of a building.

5.2.2 Additionally, the department of Housing and Urban Development (HUD) has the following standard for STC limitations for various housing units: HUD Minimum Property Standards for Housing, Section 4910.1.

6. Why Seal Openings?

6.1 The sound transmission of a wall, ceiling, or floor, no matter how well built, can be substantially defeated by the presence of unsealed joints, voids, and penetrations. Fig. 1 illustrates examples of how sound travels through unsealed joints, voids, and penetrations in walls and how sealing them will minimize sound transmission.

6.2 The effect of unsealed joints, voids, and penetrations on the STC rating of partition walls is illustrated in Fig. 2. For the sample wall example, with an STC rating of 40 that has openings that total 9 cm² (1.4 in.²) will have its STC reduced to 36 a 10 % difference. However, that small difference results in a change to the apparent loudness of sound transmission to that which is twice as loud.

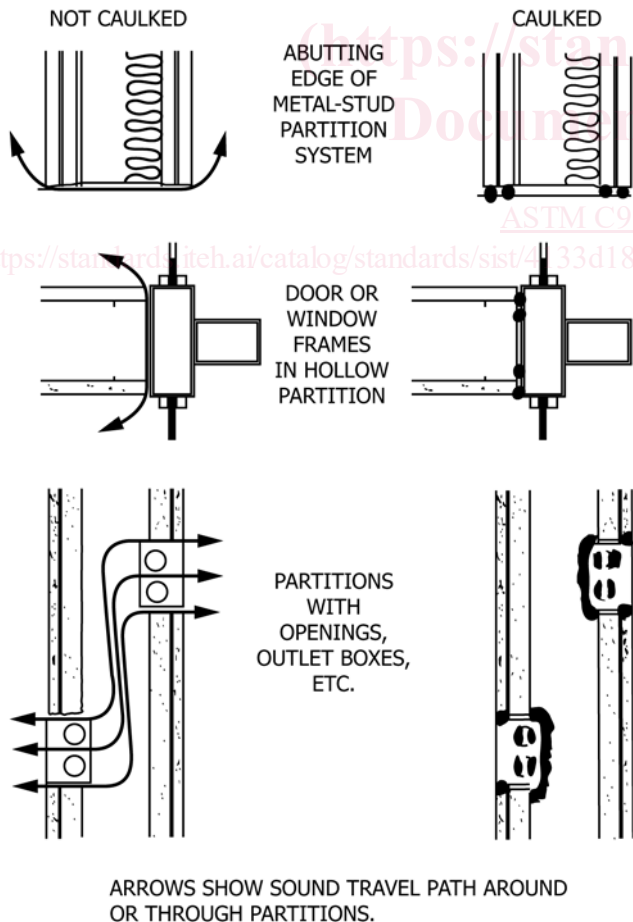


FIG. 1 Examples of Achieving an Effective Sound Barrier and Maintaining the Designed STC Value of Partition Systems

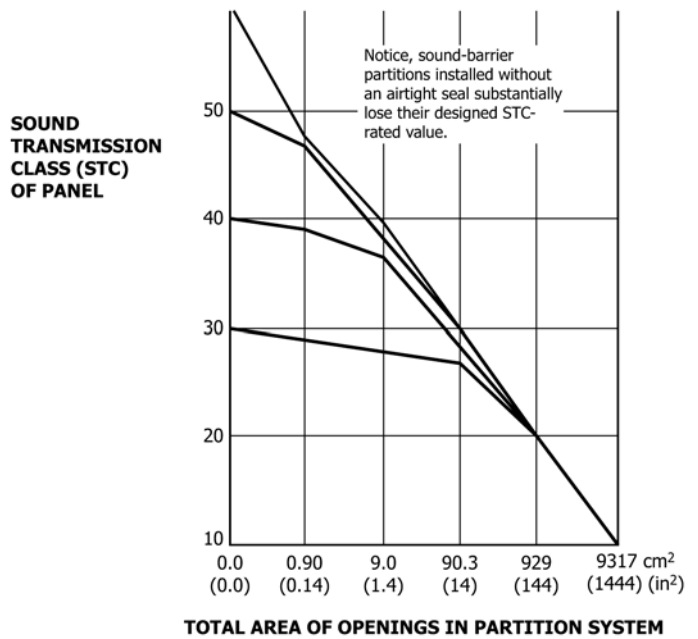


FIG. 2 Effect of Unsealed Hole Openings on STC-Rated Test Wall, 3.8 by 2.4 m (12 ft 6 in. by 8 ft)

7. Positioning of Sealants

7.1 Fig. 3 illustrates placement of liquid-applied sealants to improve the STC rating from a value of 29 to a value of 53. Note that two properly placed sealants are sufficient and sealing beyond that is unnecessary.

8. Application of Sealants

8.1 Fig. 4 illustrates typical liquid-applied sealant applications. Additional sealant application information can be obtained from Guide C1193 and manufacturers literature for specific products and applications.

9. Types of Sealants

9.1 *Precured Sealants*—Precured sealants include a wide variety of gaskets and tapes, and foamed shapes that have constant dimensions. These materials are effective sound seals when the tolerances for joint, void, or penetration opening can be accurately predicted and installed within those tolerances. A varying opening width along its length, which exceeds those tolerances, will cause the gasket, tape or foamed shape to have difficulty in maintaining a proper seal at all points with the constant compression that is necessary to effect a seal. Precured sealants in the form of pads have proved to be effective for sealing electric, telephone, television and other types of jack and back boxes.

9.2 *Non-Sag Sealants*—These liquid-applied sealants can conform to the wide range of sizes encountered in joints, voids, and penetrations especially those that have tolerances exceeding those applicable for precured sealants. The following types are available:

9.2.1 *Nondrying, Nonhardening, Nonskinning Sealants*—These types of sealants have proven to be effective in reducing sound transmission. By remaining flexible as well as permanently adhesive, they can maintain an effective seal. These