



Designation:~~C919-08~~ Designation: C919 - 12

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 ~~is a guide~~ provides information for the use of sealants to reduce the 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.

2. Referenced Documents

2.1 ~~ASTM Standards:~~² ~~C570 Specification for Oil- and Resin-Base Caulking Compound for Building Construction~~

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](#)

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](#)

E497 [Practice for Installing Sound-Isolating Lightweight Partitions](#) ~~Classification for Rating Sound Insulation~~

2.2 ~~HUD Standards:~~³ ~~HUD Minimum Property Standards for One and Two Family Housing, Section 4900.1~~

HUD Minimum Property Standard for Multi Family Housing, Section 4910.1

HUD Minimum Property Standard for Care Type Housing, Section 4920.1 ~~HUD Minimum Property Standards for Housing, Section 4910.1~~

2.3 ~~IBC Standard:~~⁴

[International Building Code \(IBC\), Section 1207](#)

3. Significance and Use

3.1 ~~Construction utilizing lightweight walls and floors can have undesirable sound transmission characteristics if care is not taken to seal joints and voids that are common to this type of construction. By sealing these penetrations the transmission of sound can be diminished.~~

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.

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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.

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>.

4. Sound Transmission Class

4.1 The construction industry has adopted Sound Transmission Class (STC) units (defined in Terminology 3.1 *Definitions*)—For definitions of terms used in this recommended practice, see Terminologies C717 and C634—to rate the sound barrier properties of walls, ceilings, and floors. The STC is determined in accordance with Classification .

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 or and E336. Note 1—For example, The Department of Housing and Urban Development (DHUD) has issued the following three standards dealing with the STC limitation in various housing units: HUD Minimum Property Standard for One and Two Family Housing, Section 4900.1; HUD Minimum Property Standard for Multi Family Housing, Section 4910.1; and HUD Minimum Property Standard for Care Type Housing, Section 4920.1

5. Need to Seal Openings

5.1 The effect of unsealed openings on the STC of partition walls is shown in

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

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 . This chart also shows the improvement of the STC when openings are sealed. It should be recognized for slit openings that the STC values may be different from the STC value for a hole opening.

5.2 Fig. 2 shows examples of how sound travels through openings in walls and how sealing may serve to minimize sound transmission. Further examples may be found in Practice E497. 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

6. 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.

7. Positioning of Sealants

6.1

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

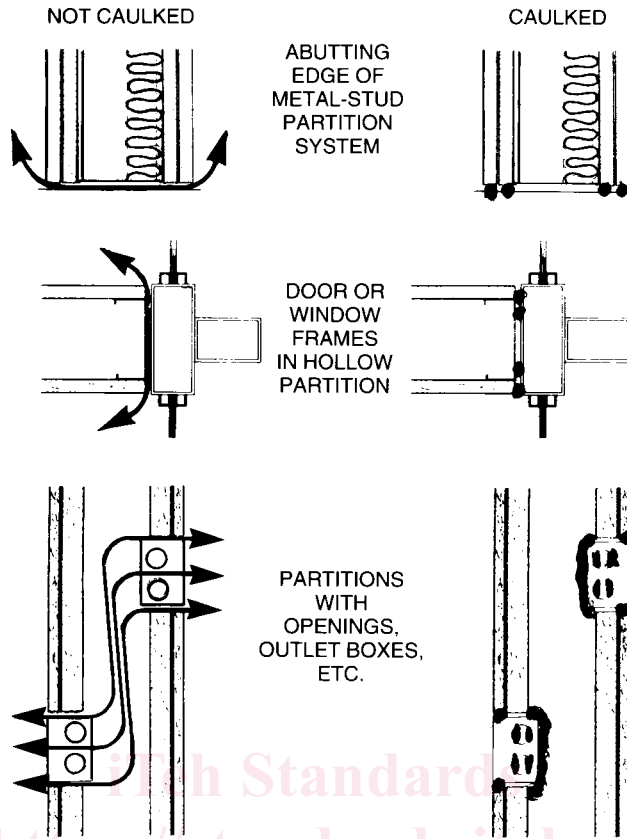
7.8. Application Method of Gunnable Sealant Sealants

7.18.1 Fig. 4 shows typical sealant applications:

8. Types of Sealant for Acoustical Improvement

8.1 *Preformed Sealants*—Preformed sealants include gasketing, tapes, and preformed foams. Most of these materials are effective only when the tolerances of the perimeter joints can be accurately predicted and installed to those tolerances. Joint sizes vary widely and preformed sealants may have difficulty in maintaining a proper seal at all points with the constant compression that is necessary to effect a seal. Preformed sealants in the form of pads have proved to be effective for sealing electric, telephone, and television jack boxes.

8.2 *Gunnable Sealants*—These sealants have the capacity of conforming to the wide range of joint sizes encountered in most construction. The following types are available:



ARROWS SHOW SOUND TRAVEL PATH AROUND OR THROUGH PARTITIONS.

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

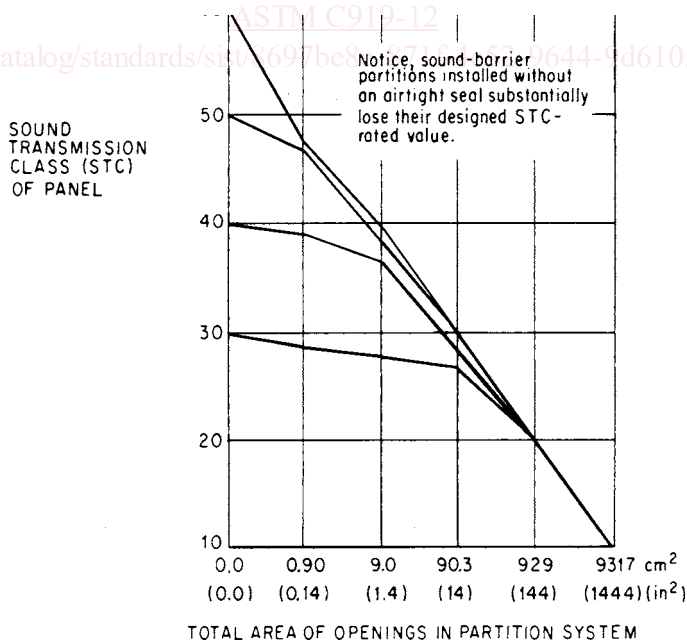


FIG. 2 Effect of Unsealed Hole Openings on STC-Rated Test Wall, 3.8 by 2.4 m (12 ft 6 in. by 8 ft)

8.2.1 *Skimming and Drying Sealants*—Skimming and drying sealants such as asphalt- and oil-based caulking compounds perform satisfactorily initially but within a short period of time could begin to shrink, harden, crack, and lose adhesion, thereby losing their