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Standard Practice for Use of Sealants in Acoustical Applications[1]

This standard is issued under the fixed designation C 919; 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 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.

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]

C 570 Specification for Oil- and Resin-Base Caulking Compound for Building Construction

C 634 Terminology Relating to Building and Environmental Acoustics

C 834 Specification for Latex Sealants

C 920 Specification for Elastomeric Joint Sealants

E 90 Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

E 336 Test Method for Measurement of Airborne Sound ~~Insulation~~ Attenuation between Rooms in Buildings

E 413 Classification for Rating Sound Insulation

E 497 Practice for Installing Sound-Isolating Lightweight Partitions

2.2 ~~*Federal Specifications:*~~

~~TT-S-1657(COM-NBS) Interim Federal Specification for Sealing Compound—Single Component, Butyl Rubber Based, Solvent Release Type (for Buildings and Other Type of Construction)~~

~~TT-C-598C(COM-NBS) Interim Federal Specification for Caulking Compound, Oil and Resin Base Type (for Building Construction)~~[4]

~~2.3 *DHUD 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

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.

4. Sound Transmission Class

4.1 The construction industry has adopted Sound Transmission Class (STC) units (defined in Definitions C 634) to rate the sound barrier properties of walls, ceilings, and floors. The STC is determined in accordance with Classification E 413. The test data are obtained in accordance with Test Methods E 90 or E 336.

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[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* ~~, Vol 04.07.~~volume information, refer to the standard's Document Summary page on the ASTM website.

~~[3] Annual Book of ASTM Standards, Vol 04.06.~~

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

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 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 E 497.

6. Positioning of Sealants

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

7. Application Method of Gunnable Sealant

7.1 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:

8.2.1 *Skinning and Drying Sealants* —Skinning 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 effectiveness in providing a positive seal. Many of these sealants tend to stain the walls. Specification C 570 ~~and Federal Specification TT-C-598C reference these sealant types.~~ references these sealant types.

8.2.2 *Nondrying, Nonhardening, Nonskinning Sealants*—Of all the products evaluated to date, the nondrying, nonhardening, nonskinning types of sealant have proven to be the most effective in reducing sound transmission. By remaining indefinitely

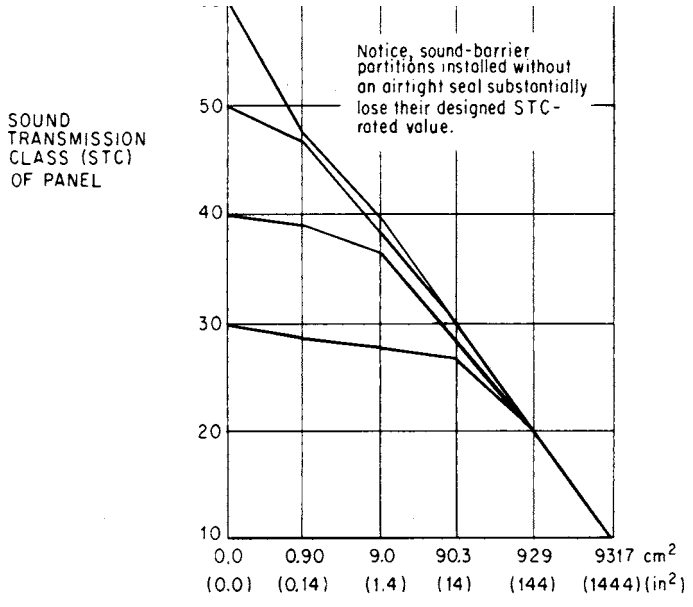

FIG. 1 Effect of Unsealed Hole Openings on STC-Rated Test Wall, 3.8 by 2.4 m (12 ft 6 in. by 8 ft)