



Designation: E1042 – 02 (Reapproved 2021)

Standard Classification for Acoustically Absorptive Materials Applied by Trowel or Spray¹

This standard is issued under the fixed designation E1042; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This classification covers materials applied by trowel or spray to surfaces for the purpose of increasing their acoustical absorption.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3 *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

C423 Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method

C634 Terminology Relating to Building and Environmental Acoustics

E84 Test Method for Surface Burning Characteristics of Building Materials

E795 Practices for Mounting Test Specimens During Sound Absorption Tests

E859 Test Method for Air Erosion of Sprayed Fire-Resistive Materials (SFRMs) Applied to Structural Members

3. Terminology

3.1 *Definitions:*

3.1.1 The acoustical terminology used in this classification is consistent with Terminology **C634**.

3.1.2 *Sound absorption average (SAA)*—a single number rating, the average, rounded off to the nearest 0.01, of the sound absorption coefficients of a material for the twelve one-third octave bands from 200 through 2500 Hz, inclusive, measured according to Test Method **C423**.

4. Significance and Use

4.1 Acoustically absorptive materials are used for the control of reverberation and echoes in rooms. This standard provides a classification method for acoustically absorptive materials applied directly to surfaces by trowel or by spray.

5. Basis of Classification

5.1 Classification is made according to type of material, acoustical properties, flame spread, and dust propensity.

5.2 *Material Type*—Classification of acoustically absorptive material according to material type is as follows:

5.2.1 *Type I*—Material is cementitious. Type I ingredients shall be uniformly mixed and ready for use by the addition of water. When received, the material in the container shall be dry and shall not be caked or sticky. After the material has been properly mixed with the amount of water specified by the manufacturer, the material shall be of such a consistency that it can be applied with a plastering trowel or with a suitable plaster-spraying machine.

5.2.2 *Type II*, Material is fibrous. Type II material shall consist of mineral or organic fiber with an integrally mixed binder, or it may be supplied for use with a liquid binder added at the time of application.

5.2.3 *Type III*, Material is cellular plastic and is intended for application over beams, walls, ceilings, and columns. Type III materials are normally designed to be mixed at the time of application.

5.3 *Noise Reduction Coefficient*—Classification of acoustically absorptive material according to its noise reduction coefficient (NRC) shall be as follows:

¹ This classification is under the jurisdiction of ASTM Committee **E33** on Building and Environmental Acoustics and is the direct responsibility of Subcommittee **E33.04** on Application of Acoustical Materials and Systems.

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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.



<i>NRC Grade Designation</i>	<i>Minimum Acceptable NRC or SAA</i>
<i>NRC 95</i>	0.95
<i>NRC 90</i>	0.90
<i>NRC 85</i>	0.85
<i>NRC 80</i>	0.80
<i>NRC 75</i>	0.75
<i>NRC 70</i>	0.70
<i>NRC 65</i>	0.65
<i>NRC 60</i>	0.60
<i>NRC 55</i>	0.55
<i>NRC 50</i>	0.50
<i>NRC 45</i>	0.45
<i>NRC 40</i>	0.40
<i>NRC low</i>	0.00

NOTE 1—Because sound absorption varies with product thickness, information on the required thickness and measurement method for a particular grade must be supplied by the manufacturer.

NOTE 2—Determine NRC or SAA values in accordance with 6.1.

NOTE 3—Since SAA is replacing NRC, SAA values may be used in lieu of NRC when rating material according to this standard classification. However, the NRC nomenclature is retained as the classification label. It is recommended that ratings based on newly acquired absorption data use SAA. Ratings based on data measured before Test Method C423 required SAA may use NRC. See Test Method C423 for more discussion of NRC and SAA.

5.4 *Flame Spread Index*—Acoustically absorptive material shall be classified according to its flame spread index as follows:

5.4.1 *Class (a)*—The flame-spread index of the acoustical material shall not exceed 25 when tested in accordance with Test Method E84, nor shall the material show evidence of progressive combustion after the test flame is extinguished. All surfaces, including those which would be exposed by cutting through the material in any way, shall meet these requirements. In addition, Class (a) materials shall have a smoke developed rating not to exceed 50 when tested in accordance with Test Method E84.

5.4.2 *Class (b)*—The flame-spread index shall not exceed 75 on the exposed surface when tested in accordance with Test Method E84.

5.4.3 *Class (c)*—The flame-spread index shall not exceed 200 on the exposed surface when tested in accordance with Test Method E84.

NOTE 4—For example: A Type II, NRC 50, at x cm (y in.) of application class (b) material is fibrous, has an NRC of 0.5 or and has a flame-spread index of less than 75. The value for x (and y) must be specified by the manufacturer.

5.5 *Dust Propensity*—Classification of acoustically absorptive material according to its dust propensity shall be as follows:

5.5.1 *Category A*—Dust removed shall not exceed 0.27 g/m² when tested in accordance with Test Method E859.

5.5.2 *Category B*—Dust removed is greater than 0.27 g/m² when tested in accordance with Test Method E859.

NOTE 5—Classification according to dust propensity is usually specified only by certain agencies of the US Government.

6. Test Methods

6.1 *Sound Absorption Test* (see 5.3)—Sound absorption, sound absorption average, and noise reduction coefficients of the absorptive material shall be determined in accordance with Test Method C423 using Type I mounting as defined in Practices E795. A separate measurement of absorption shall be performed for each NRC grade under this standard classification.

6.2 *Flame-Spread Index* (see 5.4)—The flame-spread index shall be determined in accordance with Test Method E84.

6.3 *Dust Test* (see 5.5)—When required, the dust test shall be performed in accordance with Test Method E859 except that the measurements of the dust collected will be terminated after the first 24-h test period. The reported dust removed will be the difference between the amounts of dust collected at the end of the 6-h and the 24-h purging periods.

7. Keywords

7.1 acoustically absorptive materials; dust propensity; flame-spread index; noise reduction coefficient; sound absorption; sound absorption average; spray-on materials; trowel-on materials

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