



Standard Test Method for Determining A-Weighted Sound Power Level of Vacuum Cleaners¹

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1. Scope

1.1 This test method calculates the overall A-weighted sound power level emitted by small portable upright, canister, combination vacuum cleaners, and central vacuum cleaner motorized nozzles intended for operation in domestic and commercial applications.

1.2 A-weighted sound pressure measurements are performed on a stationary vacuum cleaner in a semi-reverberant room. This test method determines sound power by a comparison method for small noise sources, that is, comparison to a broadband reference sound source.

1.3 This test method describes a procedure for determining the approximate A-weighted sound power level of small noise sources. This test method uses a non-special semi-reverberant room.

1.4 Results are expressed as A-weighted sound power level in decibels.

1.5 The values stated in inch-pound units are to be regarded as the standard. The values in parentheses are for information only.

1.6 *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.*

2. Referenced Documents

2.1 ASTM Standards:

C 634 Terminology Relating to Environmental Acoustics²

E 177 Practice for Use of the Terms of Precision and Bias in ASTM Test Methods³

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method³

F 608 Method for Evaluation of Carpet-Embedded Dirt Removal Effectiveness of Household Vacuum Cleaners

(Laboratory Method)⁴

F 655 Specifications for Test Carpets and Pads for Vacuum Cleaner Testing⁴

2.2 ANSI Standards:

S1.4 Specifications for Sound Level Meters⁵

S1.26 Method for the Calibration of the Absorption of Sound by the Atmosphere⁵

S12.31 Precision Methods for the Determination of Sound Power Levels of Broad Band Noise Sources in Reverberant Rooms⁵

S12.32 Precision Methods for Determination of Sound Power Levels for Discrete Frequency and Narrow Band Noise Sources in Reverberant Rooms⁵

S12.33 Engineering Methods for Determination of Sound Power Levels of Noise Sources in a Special Reverberant Test Room⁵

2.3 ISO Standards⁵:

These standards are similar to and may be used in place of ANSI S12.31, S12.32, and S12.33, respectively:

3741 Acoustics—Determination of Sound Power Levels of Noise Sources Using Sound Pressure—Precision Methods for Reverberation Rooms

3742 Acoustics—Determination of Sound Power Levels of Noise Sources—Precision Method for Discrete-Frequency and Narrow-Band Sources in Reverberation Rooms

3743 Acoustics—Determination of Sound Power Levels of Noise Sources—Engineering Methods for Small, Movable Sources in Reverberant Fields

2.4 IEC Standard:

60704.1 Test Code for the Determination of Airborne Acoustical Noise Emitted by Household and Similar Electrical Appliances⁵

3. Terminology

3.1 Definitions:

3.1.1 *population, n*—the total of all of the units of the particular model and/or type of vacuum cleaner being tested.

3.1.2 *population sample or sample, n*—three or more test units, randomly taken from the population.

¹ This test method is under the jurisdiction of ASTM Committee F11 on Vacuum Cleaners and is the direct responsibility of Subcommittee F11.25 on Sound Measurement.

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² Annual Book of ASTM Standards, Vol 04.06.

³ Annual Book of ASTM Standards, Vol 14.02.

⁴ Annual Book of ASTM Standards, Vol 15.08.

⁵ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.