



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, backpack vacuum cleaners, hard-floor machines, and central vacuum cleaner motorized nozzles intended for operation in domestic and commercial applications.

1.1.1 To determine the Sound Power Level of a central vacuum at the power unit location refer to Test Method F2544.

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 (referenced to one picowatt).

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:²

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 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.

C634 Terminology Relating to Building and Environmental Acoustics

E177 Practice for Use of the Terms Precision and Bias in ASTM Test Methods

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

F608 Test Method for Evaluation of Carpet Embedded Dirt Removal Effectiveness of Household/Commercial Vacuum Cleaners

F655 Specification for Test Carpets and Pads for Vacuum Cleaner Testing

F2544 Test Method for Determining A-Weighted Sound Power Level of Central Vacuum Power Units

F2607 Test Method for Measuring the Hard Surface Floor-Cleaning Ability of Household/Commercial Vacuum Cleaners

2.2 ANSI Standards:³

ANSI S1.10 Method for the Calibration of Microphones

ANSI S1.43 Specifications for Integrating-Averaging Sound Level Meters

ANSI S12.51/ISO 3741 Acoustics - Determination of sound power levels of noise sources using sound pressure - Precision methods for reverberation rooms

ANSI S12.53/ISO 3743 Acoustics - Determination of sound power levels of noise sources - Engineering methods for small, movable sources in reverberant fields

ANSI S12.57/ISO 3747 Standard Acoustics - Determination of sound power levels of noise sources using sound pressure - Comparison method in situ

3. Terminology

3.1 Definitions:

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

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

3.1.3 *reference sound source, n*—a standard source of broadband sound with a certified set of sound power emissions.

³ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.