ANSI/AHRI Standard 230

2013 Standard for

Sound Intensity Testing Procedures for Determining Sound Power of HVAC Equipment

Approved American National Standard
ANSI

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IMPORTANT

SAFETY DISCLAIMER

AHRI does not set safety standards and does not certify or guarantee the safety of any products, components or systems designed, tested, rated, installed or operated in accordance with this standard/guideline. It is strongly recommended that products be designed, constructed, assembled, installed and operated in accordance with nationally recognized safety standards and code requirements appropriate for products covered by this standard/guideline.

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Note:

This is a new Standard.

This standard describes the methodology for determination of Sound Power Levels of broad-band, and/or discrete-frequency noise sources using the intensity method. It is based on sound tests utilizing the sound intensity method as described in ISO 9614-1 (measurement at discrete points, grade 2) or ISO 9614-2 (measurement by scanning, grade 2).

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SOUND INTENSITY TESTING PROCEDURES FOR DETERMINING SOUND POWER OF HVAC EQUIPMENT

Section 1. Purpose

1.1 *Purpose.* The purpose of this standard is to provide the methodology for the determination of Sound Power Levels of noise sources using the sound intensity method. The standard contains information on instrumentation, installation and operation of the source and procedures for the calculation of Sound Power Level.

This standard covers the frequency range from the 50 Hz to the 10,000 Hz One-third Octave Band (63 Hz to 8000 Hz Octave Bands). The product specific AHRI sound performance rating standard will specify the frequency range of interest for qualification, calculation, and reporting. This standard is based on ISO 9614-1 (grade 2) or ISO 9614-2 (grade 2) but provides additional exceptions and extensions. Section 7.2 refers to measurement at discrete points and Section 7.3 refers to measurement by scanning.

1.1.1 *Intent.* This standard is intended for the guidance of the industry, including manufacturers, engineers, installers, contractors and users.

1.1.2 *Review and Amendment.* This standard is subject to review and amendment as technology advances.

1.2 *Measurement Uncertainty.* Sound Power Levels obtained from intensity measurements made in conformance with this standard shall result in measurement standard deviations which are equal to or less than those in Table 1. The uncertainties in this table include uncertainty in the sound intensity measurement method due to the test environment, background noise levels and selection of measurement points as defined in ISO 9614-1 (grade 2) or measurement surfaces in ISO 9614-2 (grade 2). The standard deviations in Table 1 do not account for variations of sound power caused by changes in operating conditions.

Table 1. Maximum Standard Deviations of Sound Power Level Reproducibility Determined in Accordance With This Standard

One-third Octave Band Center Frequency, Hz	One-third Octave Band Maximum Standard Deviation of Reproducibility, dB
50 - 80	4.0
100 - 160	3.0
200 - 315	2.0
400 - 5000	1.5
6000 - 10000	3.0

Section 2. Scope

2.1 *Scope.* This standard applies to HVAC products where sound power is determined by measurement using the sound intensity method. This standard provides a standalone method of test that is referenced by other AHRI sound performance rating standards and provides an alternative to the reverberation room method of test outlined in AHRI Standard 220.

Section 3. Definitions

All terms in this document will follow the standard industry definitions in the *ASHRAE Wikipedia* website (http://wiki.ashrae.org/index.php/ASHRAEwiki) unless otherwise defined in this section.

3.1 *Broadband Sound.* Sound that is random in nature with frequency components distributed over a broad frequency band. Typically pure tones or periodic disturbances will not be distinguishable in this type of sound spectrum.

3.2 *Discrete Frequency Sounds/Tones.* These consist of one or more sounds, each of which is essentially sinusoidal.

3.3 *Discrete Frequency Source*. A noise source that produces Discrete Frequency Sounds/Tones.