AHRI Standard 220-2022 (SI)

2022 Standard for

Reverberation Room Qualification and Testing Procedures for Determining Sound Power of HVAC Equipment

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ICS Code: 17.140.01

Note:

This standard supersedes ANSI/AHRI Standard 220-2015.

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Foreword

This standard describes the methodology for determination of *sound power levels* of HVAC noise sources containing broad-band or discrete-frequency noise, or both, in reverberation rooms. It is based on ASA/ANSI S12.51/ISO 3741. The method described herein requires reverberation room pre-qualification through test and the use of the *comparison method* to determine *sound power levels*. This standard specifies the physical environment, procedures, and equipment to qualify the reverberation room by test. Pre-qualifying the room verifies modal density with the use of one source location to obtain uncertainty of results as defined by this standard. The *reference sound source* (*RSS*) used for the *comparison method* relies on AHRI Standard 250 to accurately calibrate the *RSS* at all frequencies of interest. The standard contains information on instrumentation, installation and operation of the source, procedures for determining the number of microphone positions or length of traverse, and procedures for the calculation of *sound power levels*.

This standard is more restrictive than ASA/ANSI S12.51/ISO 3741, that allows the user to test using either the *direct method* or the *comparison method* and allows the user to employ a space with characteristics described. The intent of ASA/ANSI S12.51/ISO 3741 is to have a room that provides a specific environment for testing, with the understanding that if the result has a variation that is too high, the user can increase the number of measurement locations to improve the spatial averaging and thus lower the variation. This should not be used for sources that are difficult to move.

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Intent

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

Review and Amendment

This standard is subject to review and amendment as technology advances.

2022 Edition

This edition of AHRI Standard 220, *Reverberation Room Qualification and Testing Procedures for Determining Sound Power of HVAC Equipment*, was prepared by the Testing and Analysis Standards Technical Committee. The standard was published by the Sound and Vibration Standards Subcommittee in September 2022.

Origin and Development of AHRI Standard 220

The initial publication was ARI Standard 220-2007, *Reverberation Room Qualification and Testing Procedures for Determining Sound Power of HVAC Equipment*. Subsequent revisions were:

ANSI/ARI Standard 220-2012, *Reverberation Room Qualification and Testing Procedures for Determining Sound Power of HVAC Equipment*

ANSI/AHRI Standard 220-2015, *Reverberation Room Qualification and Testing Procedures for Determining Sound Power of HVAC Equipment*

Summary of Changes

AHRI Standard 220-2022 (SI) contains the following update(s) to the previous edition:

- Harmonized equations and Section 6.5.1 of AHRI Standard 220 with Section 9.1.2 of ASA/ANSI S12.51-2012 / ISO 3741:2010 (R2020)
- Updated references to ASA/ANSI S12.51-2012 / ISO 3741:2010 (R2020)
- Clarify Section 5.2.2, Section 5.2.3, and Section 5.2.4
- Updated Section 5.1 for accuracy of the minimum requirements
- Updated Section 4.6 to allow for arbitrarily traversing microphones

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Testing and Analysis Standards Technical Committee Scope:

The Testing and Analysis STC is responsible for development and maintenance of standards and guidelines related to procedures for testing, analysis, calibration of instrumentation, and qualification of test facilities for sound and vibration.

This STC will also be responsible for topics not in scope of the other Sound & Vibration STCs.

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The scope of the Sound & Vibration Standards Subcommittee is standards and guidelines related to sound and vibration for any AHRI product sector. (The definition of and list of products associated with each sector are found on the AHRI website.)

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