

AHRI Standard 220-2022 (SI)

**2022 Standard for
Reverberation Room
Qualification and Testing
Procedures for Determining
Sound Power of HVAC
Equipment**



**AIR-CONDITIONING, HEATING,
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2311 Wilson Boulevard, Suite 400
Arlington, VA 22201, USA
www.ahrinet.org
PH 703.524.8800
FX 703.562.1942



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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.

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

Committee Personnel
AHRI Standard 220-2022 (SI) Ad Hoc Group

Participant	Interest Category Classification	Voting Role	State / Province / Country
Paul Bauch Johnson Controls, Inc.	Product Manufacturer	Chair	PA, USA
Edgar Duroni Price Industries Inc	Product Manufacturer	Primary	MB, Canada
Jim Kline Intertek	Testing Laboratory	Primary	NY, USA
Derrick Knight Trane U.S. Inc.	Product Manufacturer	Primary	WI, USA
Steve Lind Lind Acoustics LLC	General Interest	Primary	WI, USA
Kim Osborn Nortek Air Solutions, LLC	Product Manufacturer	Primary	MO, USA
Miles Strand Emerson Commercial and Residential Solutions	Product Manufacturer	Primary	OH, USA
Lee Tetu Carrier Corporation	Product Manufacturer	Primary	NY, USA
Jeffrey Watt Goodman Manufacturing Company, L.P. dba Daikin Manufacturing Company, L.P.	Product Manufacturer	Primary	MN, USA
Patrick Marks Johnson Controls, Inc.	Product Manufacturer	Alternate to Paul Bausch	PA, USA
Nabil Shahin	AHRI Staff Liaison		

Testing and Analysis Standards Technical Committee

Participant	Interest Category Classification	Voting Role	State / Province / Country
Kim Osborn Nortek Air Solutions, LLC	Product Manufacturer	Chair	MO, USA
Edgar Duroni Price Industries Inc	Product Manufacturer	Primary	MB, Canada
Roger Howard Johnson Controls, Inc.	Product Manufacturer	Primary	PA, USA
Diane Jakobs Rheem Manufacturing Company	Product Manufacturer	Primary	AR, USA
Jim Kline Intertek	Testing Laboratory	Primary	NY, USA
Derrick Knight Trane U.S. Inc.	Product Manufacturer	Primary	WI, USA
Steve Lind Lind Acoustics LLC	General Interest	Primary	WI, USA
Karl Peterman Swegon North America Inc.	Product Manufacturer	Primary	ON, Canada
Marcelo Real Tecumseh Products Company	Product Manufacturer	Primary	MI, USA
Karina Saenz-Acosta Aaon, Inc.	Product Manufacturer	Primary	OK, USA
Miles Strand Emerson Commercial and Residential Solutions	Product Manufacturer	Primary	OH, USA
Lee Tetu Carrier Corporation	Product Manufacturer	Primary	NY, USA
Jeffrey Watt Goodman Manufacturing Company, L.P. dba Daikin Manufacturing Company, L.P.	Product Manufacturer	Primary	MN, USA
Paul Bauch Johnson Controls, Inc.	Product Manufacturer	Alternate to Roger Howard	PA, USA
Sungjin Cho Emerson Commercial and Residential Solutions	Product Manufacturer	Alternate to Miles Strand	OH, USA
Anthony Dix Trane Technologies	Product Manufacturer	Alternate to Derrick Knight	NC, USA

Participant	Interest Category Classification	Voting Role	State / Province / Country
Chuntao Luo Goodman Manufacturing Company, L.P. dba Daikin Manufacturing Company, L.P.	Product Manufacturer	Alternate to Jeffrey Watt	TX, USA
Patrick Marks Johnson Controls, Inc.	Product Manufacturer	Alternate to Roger Howard	PA, USA
Greg Meeuwsen Trane Technologies	Product Manufacturer	Alternate to Derrick Knight	NC, USA
Nabil Shahin	AHRI Staff Liaison		

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.

Sound and Vibration Standards Subcommittee

Participant	Interest Category Classification	Voting Role	State / Province / Country
Derrick Knight Trane Technologies	Product Manufacturer	Chair	WI, USA
Paul Bauch Johnson Controls, Inc.	Product Manufacturer	Primary	PA, USA
Diane Jakobs Rheem Manufacturing Company	Product Manufacturer	Primary	AR, USA
Kim Osborn Nortek Air Solutions, LLC	Product Manufacturer	Primary	MO, USA
Karl Peterman Swegon North America Inc.	Product Manufacturer	Primary	ON, Canada
Miles Strand Emerson Commercial and Residential Solutions	Product Manufacturer	Primary	OH, USA
Lee Tetu Carrier Corporation	Product Manufacturer	Primary	NY, USA
Jeffrey Watt Goodman Manufacturing Company, L.P. dba Daikin Manufacturing Company, L.P.	Product Manufacturer	Primary	MN, USA
Karl Best	AHRI Staff Liaison		

Sound and Vibration Standards Subcommittee Scope:

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.)

TABLE OF CONTENTS

SECTIONS	PAGE
Section 1. Purpose	1
Section 2. Scope.....	1
Section 3. Definitions	1
3.1 Expressions of Provision	1
3.2 Standard Specific Definitions.....	2
Section 4. Requirements for Qualification of Reverberation Rooms.....	3
4.1 Reverberation Room Requirements	3
4.2 Instrumentation Requirements	3
4.3 Standard Deviation Requirements for Broadband Room Qualification	3
4.4 Standard Deviation Requirements for Discrete Frequency Room Qualification.....	3
4.5 Microphone Locations.....	4
4.6 Microphone Traverse	4
4.7 Fixed Microphones.....	5
Section 5. Reverberation Room Qualification Procedures.....	5
5.1 Broadband Room Qualification.....	5
5.2 Discrete Frequency Room Qualification	6
Section 6. Sound Power Testing Requirements and Calculations	9
6.1 Volume of Unit Under Test (UUT)	9
6.2 Location of Unit Under Test (UUT).....	10
6.3 Reference Sound Source Requirements	10
6.4 Measurements	10
6.5 One-third Octave Band Sound Power Level Calculations	10
6.6 Octave Band Sound Power Level Calculations	12
6.7 A-weighted Sound Power Level.....	12
6.8 Linear Sound Power Level	13
Section 7. Information to Be Recorded.....	14
7.1 General	14
7.2 Noise Source Under Test.....	14
7.3 Test Environment	14
7.4 Instrumentation	14
7.5 Acoustical Data	14
Section 8. Test Report.....	15
Section 9. Conformance Conditions	15

TABLES

Table 1 Maximum Standard Deviations of Sound Power Level Reproducibility	1
Table 2 Broadband Standard Deviation Limits.....	3

Table 3 Discrete Frequency Standard Deviation Limits	4
Table 4 Test Frequencies for Discrete Frequency Qualification.....	8
Table 5 One-third Octave Band Frequency Range	9
Table 6 Background Correction Limits by One-third Octave Band	12
Table 7 One-third Octave Band Numbers and A-Weighting Factors	13
Table 8 One-third Octaves.....	18
Table 9 UUT L_w	19

APPENDICES

Appendix A. References – Normative	16
Appendix B. References – Informative.....	17
Appendix C. Sample Calculation Results – Informative	18