Why are we saying, you need AMCA 300 sound power level?

How does AHRI 260, AMCA 300, ANSI 12.60-2010 standards all tie in together?

ASHRAE Handbook, 2011 HVAC applications

Chapter 48, Noise and Vibration Control.

https://www.ashrae.org/resources--publications/Description-of-the-2011-ASHRAE-Handbook-HVAC-Applications

Source sound levels

Accurate acoustical analysis of HVAC systems depends in part on reliable equipment sound data. These data are often available from equipment manufacturers in the form of sound pressure levels at a specified distance from the equipment or, preferably, equipment sound power levels. Standards used to determine equipment and component sound data are listed at the end of this chapter.

When reviewing manufacturers' sound data, obtain certification that the data have been obtained according to one or more of the relevant industry standards. If they have not, the equipment should be rejected in favor of equipment for which data have been obtained according to relevant industry standards. See Ebbing and Blazier (1998) for further information.

Prediction of fan sound power

The sound power generated by a fan performing at a given duty is best obtained from manufacturers' test data taken under approved test conditions (AMCA Standard 300 or ASHRAE Standard 68/AMCA Standard 330).

Applications of air handling products range from stand-alone fans to systems with various modules and attachments. These appurtenances and modules can have a significant effect on air-handler sound power levels. In addition, fans of similar aerodynamic performance can have significant acoustical differences.

Predicting air-handling unit sound power from fan sound levels is difficult. Fan sound determined by tests may be quite different once the fan is installed in an air handler, which in effect creates a new acoustical environment. Proper testing to determine resulting sound power levels once a fan is installed is essential. Fan manufacturers are in the best position to supply information on their products, and should be consulted for data when evaluating the acoustic performance of fans for an air handler application. Similarly, air handler manufacturers are in the best position to supply acoustic information on air handlers.

Air handler manufacturers typically provide discharge, inlet, and casing-radiated sound power levels for their units based on one of two methods. A common method is the fan-plus-algorithm method: the fan is tested as a stand-alone item, typically using AMCA Standard 300, and an algorithm is used to predict the effect of the rest of the air-handling unit on the sound as it travels from the fan to the discharge and intake openings or is radiated through a casing with known transmission loss values.

Another method is described in AHRI Standard 260, in which the entire unit is tested as an assembly, including fans, filters, coils, plenums, casing, etc., and the sound power level at the inlet and discharge openings, as well as the radiated sound power, is measured in a qualified reverberant room. Whenever possible, data obtained by the AHRI 260 method should be used because it eliminates much of the uncertainty present in the fan-plus-algorithm method.

For a detailed description of fan operations, see Chapter 20 in the 2008 ASHRAE Handbook - HVAC Systems and Equipment. Different fan types have different noise characteristics and within a fan type, several factors influence noise.

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http://www.usgbc.org/node/2755507?view=resources

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What is sound?

Sound power, Lw

- Total sound energy produced by the source in all directions
- Measurement all other representation of sound levels are derived from (measured in dB)

Sound pressure, Lp

- Calculated from sound power, which varies as a relationship to distance from the source
- Measurement at a point in space near the source

dB vs NC: why it matters?

Decibel, dB

The decibel (dB) is the standard unit of measure for sound.

dBA is often used to denote the use of weighting filters, used to approximate the human ear's response to sound, although the measurement is still in dB.

Noise Criteria, NC

NC is a single numerical index commonly used to define design goals for the maximum allowable noise in a given space.

ASHRAE Handbook - Fundamentals

Chapter 8. Sound and vibration.

Because of the numerous assumptions made to arrive at these published values (e.g., size of room, type of ceiling, etc.) relying solely on NC rating to select terminal units and diffusers is not recommended.

Applicable standards

AHRI 260

Sound rating of ducted air moving and conditioning equipment

Our air handling units are tested in accordance with AHRI 260 standards in an accredited reverberant laboratory.

AMCA Standard 300-08

Reverberant room method for sound testing of fans

Our sound laboratory is designed and equipped to perform testing in accordance with AMCA Standard.

ANSI/ASA Standard S12.60-2010

Acoustical performance criteria, design requirements and guidelines for schools

Our equipment provides reliable data when you're designing classrooms that meet ANSI/ASA Standard S12.60-2010.

Specifications

1.11 Manufacturer shall provide sound data in accordance to AHRI Standard 260, Sound rating of ducted air moving and conditioning equipment.

1.12 Data to be collected in a qualified and accredited reverberant laboratory

1.13 Sound ratings are to be in the form of Octave Band Sound power levels (dB) from 63 to 8,000 Hz derived from One-Third Octave Band measurements

1.14 Data provided must meet or exceed minimum requirements for use within ANSI S12.60-2010 calculations.

1.15 Unit sound rating shall meet or exceed the data as per application chart

Frequency, Hz	63	125	250	500	1000	2000	4000	8000	Overall
Lw_{case}									
Lw_{disch}									