

TECHNICAL BULLETIN

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Many engineers rely on the NC tables in manufacturers' catalogs to give them an estimate of noise levels in their proposed finished spaces as well as a comparison between manufacturers. This is a relatively easy process for the consultant or the contractor because this is a single number comparison, and these numbers are easily found in manufacturers' catalogs.

There is only one standard for predicting occupied space sound levels. It is AHRI Standard 885-98 (with 2002 Addendum), "Procedure for Estimating Occupied Space Sound Levels in the Application of Air Terminals and Air Outlets". You will find in Appendix E, on the last page of the standard, a list of recommended deductions that can be used for charting catalog performance in predicting NC average values in unknown conditions. These are the criteria used in manufacturers' catalogs to calculate the cataloged NC values.

Since NC values are single numbers, they do not reflect which octave band is setting the value (where the noise peaks). This can still cause some confusion. Units peaking in the 3rd or 4th octave bands will produce a different sound quality in the room from those peaking in the 2nd octave band. They will also add noise differently to the other noise levels in the space, which will change the type of noise heard by the occupant. It is impossible to determine rumbly from hissy or neutral spectrums using only NC values. That is why other options such as RC values are sometimes used. RC values are averaged numbers with quality descriptors. For a complete description of these ratings, see AHRI Standard 885. The Standard also describes why RC values are not practical for rating equipment because of their respective averaged values. You can download a free copy of AHRI Standard 885-98 (with 2002 Addendum) at www.ahrinet.org/.

It is important to note that the deductions in Appendix E of AHRI Standard 885 are typical of a large number of averaged conditions. They are described in detail in the Standard. However, this does not mean that they are relative to your job. They certainly are not specific to your job. They may be similar, and they may have no similarity at all. That is what AHRI Standard 885 is all about: how you can reasonably predict the room sound levels of a particular room in a particular building with the proper known construction and finishing details. This could never be done in a manufacturer's catalog because these conditions are unknown at the time the catalog is printed. While Appendix E may be typical of an average office space, it is specific to none. Consequently it can only be used as general criteria.

It is also important to note that AHRI certification has nothing to do with NC levels or any other room sound level predictions. There are no AHRI certified NC values. AHRI certifies only sound power levels measured in a reverberant test chamber for variable air volume terminals. The attenuation values listed in Appendix E are applied to the sound power data that are generated per ASHRAE Standard 130-1996, "Methods of Testing for Rating Ducted Air Terminal Units" and AHRI Standard 880-98 (with 2002 Addendum), "Air Terminals" to arrive at the predicted sound pressure levels in the space. Sound power levels derived by AHRI Standard 880 and ASHRAE Standard 130 are used as a starting point before the attenuation values are deducted. It is the sound power levels measured under AHRI Standard 880 and listed in the catalog that are AHRI certified data. You can download a free copy of all AHRI certified ratings at www.ahrinet.org/.

The only way to compare performance between manufacturers using their respective catalogs is to look at their sound power levels as generated in reverberant test chambers. Those are the sound power levels by octave band, which are listed in all the catalogs. This is more difficult than single number comparisons, but it is the only way to compare without testing each unit in a fixed mock up environment. It is also the only way to add the sound pressure levels contributed by other pieces of equipment such as air handlers, ducts, dampers, terminal devices, etc. (This addition process by octave band is also described in AHRI Standard 885.) Using these added numbers, the resultant sound pressure levels for the room can then be plotted on an RC chart to predict the room sound pressure level and quality for the space being evaluated.

The Air-Conditioning, Heating and Refrigeration Institute is the trade association representing manufacturers of more than 90 percent of North American produced central air-conditioning and commercial refrigeration equipment.

October 31, 2003 -- Contact Mike Woodford (703-524-8800)

ARLINGTON, Va. - The Air Conditioning, Heating and Refrigeration Institute (AHRI) has issued a white paper entitled "Noise Criteria Levels - What They Mean and What They Do Not Mean," which is available at AHRI's Web site, www.ahrinet.org/. Also available on AHRI's Web site, free of charge, is AHRI Standard 885-98 (with 2002 Addendum), "Procedure for Estimating Occupied Space Sound Levels in the Application of Air Terminals and Air Outlets."

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