

2000 STANDARD for

SOUND RATING OF NON-DUCTED INDOOR AIR- CONDITIONING EQUIPMENT



AIR-CONDITIONING &
REFRIGERATION
INSTITUTE

Standard 350

IMPORTANT

SAFETY RECOMMENDATIONS

It is strongly recommended that the product be designed, constructed, assembled and installed in accordance with nationally recognized safety requirements appropriate for products covered by this standard.

ARI, as a manufacturers' trade association, uses its best efforts to develop standards employing state-of-the-art and accepted industry practices. However, ARI does not certify or guarantee safety of any products, components or systems designed, tested, rated, installed or operated in accordance with these standards or that any tests conducted under its standards will be non-hazardous or free from risk.

Note:

This standard supersedes ARI Standard 350-86

Note:

This version of the standard differs from the 1986 version of the standard in the following:

- a. The single number Sound Rating (SR_{ARI}) in bels has been replaced by a Sound Rating comprised of a set of Sound Power Levels expressed in decibels (dB). The set of Sound Power Levels include Octave Band Sound Power Levels ($L_{W(n)}$), an A-Weighted Sound Power Level (L_{WA}), and a Tone Adjusted A-Weighted Sound Power Level (L_{WAT}). The Sound Power Levels used for the Sound Rating are all determined from the same One-Third Octave Band Sound pressure measurements that are required in the 1986 version of the standard.
- b. The Reference Sound Source used in the sound test is calibrated in accordance with ARI Standard 250.
- c. ARI Standard 280 has been incorporated for obtaining optional sound data below 100 Hz.

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SOUND RATING OF NON-DUCTED INDOOR AIR-CONDITIONING EQUIPMENT

Section 1. Purpose

1.1 Purpose. The purpose of this standard is to establish a method to determine the Sound Rating of indoor portions of non-ducted air-conditioning equipment. The Sound Rating is comprised of a set of Sound Power Levels that include Octave Band Sound Power Levels; an A-Weighted Sound Power Level; and a Tone-Adjusted A-Weighted Sound Power Level.

Established are definitions; test requirements; rating requirements; minimum data requirements for Published Ratings; and conformance conditions.

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.

Section 2. Scope

2.1 Scope. This standard applies to the indoor portions of factory-made non-ducted air-conditioning equipment as defined in ARI Standards 210/240, 340/360, 310/380 and 440.

Section 3. Definitions

Definitions. All terms in this document shall follow the standard industry definitions in the current edition of *ASHRAE Terminology of Heating, Ventilation, Air-Conditioning and Refrigeration*, unless otherwise defined in this section.

3.1 A-Weighting. A frequency weighting applied to One-Third Octave Band data in accordance with the provisions of ANSI Standard S1.4A Amendment to ANSI S1.4.

3.2 Octave Band. A band of sound covering a range of frequencies such that the highest is twice the lowest. The Octave Bands used in this standard are those defined in ANSI Standard S1.11

3.3 One-Third Octave Band. A band of sound covering a range of frequencies such that the highest frequency is the cube root of two times the lowest. The One-Third Octave

Bands used in this standard are those as defined in ANSI Standard S1.11.

3.4 Published Ratings. A statement of the assigned values of those performance characteristics, under stated rating conditions, by which a unit may be chosen to fit its application. These values apply to all units of like nominal size and type (identification) produced by the same manufacturer. As used herein, the term Published Rating includes the rating of all performance characteristics shown on the unit or published in specifications, advertising or other literature controlled by the manufacturer, at stated rating conditions.

3.4.1 Application Rating. A rating based on tests performed at Application Rating Conditions (other than Standard Rating Conditions).

3.4.2 Standard Rating. A rating based on tests performed at Standard Rating Conditions.

3.5 Reference Sound Source (RSS). A portable, aerodynamic sound source that produces a known stable broad band sound power output. The device shall meet the performance requirements as defined in ARI Standard 250.

3.6 "Shall" or "Should." "Shall" or "should" shall be interpreted as follows:

3.6.1 Shall. Where "shall" or "shall not" is used for a provision specified, that provision is mandatory if compliance with the standard is claimed.

3.6.2 Should. "Should" is used to indicate provisions which are not mandatory but which are desirable as good practice.

3.7 Sound Power Level, L_w . This is ten times the logarithm to the base ten of the ratio of the sound power radiated by the source to a reference power, expressed in decibels (dB). The reference power used in this standard is 1 picowatt (pW).

3.8 Sound Pressure Level, L_p . This is twenty times the logarithm to the base ten of the ratio of a given sound pressure to a reference sound pressure of 20 μ Pa, expressed in decibels (dB).

3.9 Sound Rating. A set of values that characterize the sound behavior of a unit. For this standard, the Sound Rating is comprised of a set of Sound Power Levels that are derived