



STANDARD

ANSI/ASHRAE Standard 200-2018

(Supersedes ANSI/ASHRAE Standard 200-2015)

Includes ANSI/ASHRAE addenda listed in Appendix I

Methods of Testing Chilled Beams

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NOTE

Approved addenda, errata, or interpretations for this standard can be downloaded free of charge from the ASHRAE website at www.ashrae.org/technology.

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FOREWORD

ASHRAE Standard 200 was written at the request of the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) to provide test instrumentation and facilities, installation methods, and procedures for determining the capacity and related performance of chilled beams. Procedures provided in this standard apply to active chilled beams.

This standard was prepared in cooperation with the AHRI Chilled Beams Section, and it is referenced in AHRI Standards 1240 (I-P) and 1241 (SI), Performance Rating of Active Chilled Beams, as the method of test for the AHRI Active Chilled Beam (ACB) certification program.

Changes from the 2015 edition of the standard include clarifications/revisions to the acoustical testing requirements, as well as verified test methods for induction ratio and water pressure drop.

1. PURPOSE

1.1 To define laboratory methods of testing chilled beams to determine performance.

2. SCOPE

2.1 Defines laboratory methods of testing chilled beams to determine performance.

2.2 Specifies test instrumentation, facilities, installation methods, and procedures for determining the performance of chilled beams.

3. DEFINITIONS AND SYMBOLS

3.1 Definitions

active chilled beam: an air induction and diffusion device that introduces and conditions air for the purpose of temperature and/or humidity control. Primary air is delivered through a series of nozzles, which induces and conditions secondary air through a unit-mounted coil.

induced air: the flow of secondary air into a chilled beam resulting from a pressure differential within the beam, distributed and circulating through the coil.

octave band: a frequency band of sound with an upper limit that is twice the frequency of the lowest limit. The center frequency of an octave band is the geometric mean of its upper and lower limits. Table 1 shows octave bands 1 through 8.

passive chilled beam: a cooled element or coil fixed in, above, or below a ceiling that sensibly cools through natural convection using buoyancy-driven airflow. The cooling media in the coil is water.

Table 1 Octave Band Center Frequencies

Octave Band	Center Frequency, Hz
1	63
2	125
3	250
4	500
5	1000
6	2000
7	4000
8	8000

radiation shielded sensor: resistive temperature devices (RTDs) designed to measure dry-bulb air temperatures are susceptible to radiation heat transfer, and therefore the total temperature measured is the sum of the air temperature and the radiation component generated by a heat source or heat sink where present. Radiant shields must be attached to the RTD to minimize the effect of radiant heat transfer. The radiant shield must be designed such that the incoming radiation is deflected while not obstructing air currents. The maximum surface emissivity for the shield is 0.09. The shield must be made of a thin conductive film or metal with high thermal conductivity greater than 87 Btu·ft/(h·ft²·°F) (150 W/m·K). The inside of the shield must be designed to absorb incident radiation that may enter the shield through air vents, and interior emissivity must be greater than 0.75. (**Informative Note:** See Informative Appendix D for more information.)

sound power: in a specified frequency band, the rate at which sound energy is radiated by a noise source, expressed in watts (W).

sound power level (L_w): ten times the logarithm to the base ten of the ratio of the sound power radiated by the source to a reference sound power, expressed in decibels (dB). The reference sound power used in this standard is 10⁻¹² W.

sound pressure: in a specified frequency band, a fluctuating pressure superimposed on the static pressure by the presence of sound.

sound pressure level (L_p): twenty times the logarithm to the base ten of the ratio of the sound pressure radiated by the noise source under test to a reference sound pressure of 20 μPa, expressed in decibels (dB).

(**Informative Note:** For terms not defined above, refer to definitions on the ASHRAE Terminology website.)

3.2 Symbols

- a empirical coefficient (different for I-P and SI units)
- a' empirical coefficient (different for I-P and SI units)
- A_f coil-free cross-sectional area perpendicular to direction of induced airflow, ft² (m²)
- b empirical coefficient (different for I-P and SI units)
- b_s center distance between thermal simulators (between 4 and 6 ft [1.2 and 1.8 m])