

**PERFORMANCE STANDARDS PROGRAM****Audio Coverage Uniformity (ACU)  
Standard Overview**

**Abstract:** One of the fundamental goals of sound system performance for both speech reinforcement and program audio is the delivery of consistent coverage in the listening area. A well executed audio system design is one that allows all listeners to hear the system at approximately the same sound pressure level throughout the desired frequency spectrum range, no matter where positioned in the designated listening area. This Standard provides a procedure to measure this spatial coverage, and criteria for use in the design and commissioning of audio systems.

**Application:** The procedures described in this standard are intended to be used primarily for AV presentation systems where audio is provided as a part of the system within an enclosed environment. These systems may be installed within a variety of AV applications, including conference rooms, training rooms, classrooms, auditoria, theaters and museum exhibits. This Standard may also be applied to large venue audio systems or any system that includes audio coverage within enclosed spaces.

This Standard is limited to uniformity measurements and specifically does not include testing or measurements for spectral response or other parameters that may be required to assess the total performance of an audio system.

**Technical Concept:** The ACU standard introduces a revolutionary approach towards evaluating the spatial uniformity aspect of an audience's experience. This approach differs from past evaluations by recognizing the importance of uniform coverage across the audible frequency spectrum. Previous best practices utilized the "weighted" dBA or dBC curves that only provide a single, frequency-averaged level at each measurement location. The ACU standard defines the following concepts:

- Number of measurement locations based on a percentage of the listener area
- Deliverable document that illustrates these locations on a plan drawing
- Pink noise or frequency sweep generation through the audio system
- Six measurements at each location at the center of the octave bands, using a Real-Time Analyzer (RTA) or similar instrument (250 Hz, 500 Hz, 1 kHz, 2 kHz, 4 kHz, and 8 kHz)
- Deliverable reporting scheme in table or spreadsheet form for all measurement locations: each location is represented with each of the frequency bands
- Median calculation of the measurement results from each frequency band
- Overall deviation from median for each frequency is the ACU: these six numbers in dB define the entire system's uniformity. Compliance to ACU is defined as a deviation within +/- 3dB in each of the six bands
- One additional band below, and one above, the six ACU bands are defined for "full-bandwidth" systems (125 Hz and 16 kHz)
- Dimensions in Metric / SI (and parenthesized Imperial) units for international use
- Trademarked logo identifies the concept, documents, and conformance

**Benefits:** The ACU Standard has been developed using the ANSI imperatives of *consensus, openness, balance, transparency, due process, flexibility, timeliness, and coherence*. Architects, facilities managers, owners, and technology managers will benefit from a test which verifies that their audio system meets one important criterion of quality.