



## Permissible Background Noise In Audiometric Testing Rooms

A major component necessary for a good hearing test is sufficient quiet in a test room or booth. To ensure that tests meet the minimum noise restrictions within a test environment to obtain a valid test, OSHA adopted the ANSI (American National Standards Institute) *Maximum Allowable Octave Band Sound Pressure Levels For Audiometric Test Rooms*:

TABLE D-1 - MAXIMUM ALLOWABLE OCTAVE-BAND SOUND PRESSURE LEVELS FOR AUDIOMETRIC TEST ROOMS

Octave-band center frequency (Hz).....	500	1000	2000	4000	8000
Sound pressure level (dB) ...	40	40	47	57	62

Although ANSI has made several revisions to this standard, OSHA has yet to officially adopt the recent 1999 ANSI revision (ANSI S3.1-1999). The current OSHA recognized standard is the result of earlier ANSI standards originally published in 1960 and revised in 1977.

The 1977 revision listed Maximum Permissible Ambient Noise Levels in “Ear Covered” [EC] conditions and “Ears Not Covered” [ENC] (EC conditions simulated standard audiometric testing with earphones while ENC simulated free field testing required for special audiological tests not normally associated with industrial hearing conservation program testing).

The current standard is based upon the 1977 [ENC] Maximum Permissible Ambient Noise Levels For Audiometric Test Rooms. The tolerances (40 dB @ 500 Hz, 40 dB @ 1000 Hz, 47 dB @ 2000 Hz, 57 dB @ 4000 Hz, and 62 dB @ 8000 Hz) were derived from scientifically averaged attenuations provided by earphones using data from earlier research.

An adequate test environment is essential for valid audiometric testing. Before performing a test, whether in a test booth or quiet room, background noise levels must be evaluated. Today, this is most commonly accomplished by either use of a sound level meter (with an octave - band filter) or through the use of a bio-acoustic simulator with built-in real time background noise capability.

Although OSHA had not adopted the 1999 ANSI revision, it is desirable to comply with these newer (and stricter) background noise tolerances. All T K Group mobile test vans are equipped with background noise monitors. Our van staffs ensure that testing is done in environments that meets or exceed OSHA mandated permissible background noise levels. In the event that permissible noise levels are exceeded within even one octave band, testing in progress is



suspended until such a time that background noise is back within acceptable tolerances. If required, the test van is relocated to a quieter venue.

The table below list actual background noise level measurements taken on 10 station T K Group mobile vans during working conditions. **Note that T K group complies with the newer ANSI 1999 standard.**

Octave Band Center Frequency (Hz)	500	1000	2000	4000	6000
Permissible Sound Pressure Level (dB)	40	40	47	53	62
<b>ANSI S.1-1999</b>	20	27	28	35	44
Ambient Noise Level Inside Test Booth With Air Conditioning ON (dB)	23	16	14	14	14
Ambient Noise Level Inside Test Booth With Heating ON (dB)	21	14	14	13.5	13.5

Measured by Niemoeller Associates, Inc. -Acoustic Systems booths are installed on all T K Group, Inc. 10 Station mobile units.

(For confirmation, contact Acoustic Systems: Austin, TX Ph: (800) 749-1460)

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