



Ensuring Tolerant Noise Levels On T K Group Mobile Vans

The Occupational Safety and Health Administration (OSHA) mandates MAXIMUM ALLOWABLE OCTAVE BAND SOUND PRESSURE LEVELS FOR AUDIOMETRIC TEST ROOMS:

Octave Band Center Frequency 500 Hz	40 dBSPL
Octave Band Center Frequency 1000 Hz	40 dBSPL
Octave Band Center Frequency 2000 Hz	47 dBSPL
Octave Band Center Frequency 4000 Hz	57 dBSPL
Octave Band Center Frequency 6000 Hz	62 dBSPL

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When a T K Group mobile test van arrives on site for testing, the van staff initially measures ambient background noise levels within the van's sound attenuated test room using a sound level meter to ensure that sound pressure levels fall below maximum allowable levels. Ambient environmental noise, however, is an inherent and sometimes unavoidable component of mobile audiometric testing.

During the testing process, we use an instrument called an Octave Band Analyzer that measures sound energy at discreet frequencies (rather than a wide range of frequencies as the case when using a sound level meter) to identify the presence of sound energy that may potentially interfere and *mask* test signals (tones). In the event that noise levels exceed allowable tolerances, technician(s) are alerted (visually) and the testing process is paused until the noise has subsided. Testing will resume only after noise levels have returned to acceptable tolerances. The technician will then "recheck: any test frequency potentially affected by the noise interference.

If it is determined that the van site is not conducive to consistent acceptable tolerances, the mobile test unit is relocated to an alternate location at the facility. Background noise levels within the test chamber are once again measured ensure compliance.

¹ OSHA 29 CFR 1910.95



Although we do our absolute best to minimize and/or eliminate extraneous noise during testing, it is important to understand that occasional ambient noise falling *below* Maximum Allowable tolerances does not usually compromise test validity, in part due to *principals of masking*. This acoustical phenomenon carries profound implications on mobile hearing testing. Masking is a known and controllable acoustical phenomenon demonstrated, for example, when an interfering signal (noise) has sufficient intensity and spectral energy to mask or “cover-up” the test signal (test tone) attempted to be perceived or heard by the test subject.

When interfering noise has sufficient intensity to mask or “cover-up” a test signal, the test subject’s threshold is effectively worsened; resultantly, a higher intensity test signal (tone) is needed to reach the test subject’s threshold. Due to the principal of masking, we know that an interfering noise centered on 500 Hz with a maximum intensity of 20 dB SPL *cannot* mask a signal (tone) presented at 40 dB SPL. That is, noise centering on the octave band frequency of 500 Hz with an intensity of 20 dB SPL cannot “cover- up” a test signal (tone) to the extent whereupon the test subject’s threshold is artificially worsened. Nor can a 500 Hz with a maximum intensity of 20 dB SPL mask a signal presentation of 2000 Hz presented at 45 dB SPL. This scientific knowledge is the basis of the MAXIMUM ALLOWABLE OCTAVE BAND SOUND PRESSURE LEVELS FOR AUDIOMETRIC TEST ROOMS.

Authored by: Robert Williams, Au.D. | Director Audiology | T K Group, Inc.