

NOISE MEASUREMENT METHODS

For personal noise exposure monitoring, a noise integrating dosimeter was attached to the employee's belt or waistband and a small microphone (Type 2), connected to the dosimeter by a thin microphone cord, was fastened to the employee's clothing on the top of the shoulder at a point midway between the ear and outside of the shoulder. For most measurements, a windscreen was placed over the microphone to reduce or eliminate wind noise or artifact noise, which can occur if objects bump against an unprotected microphone. Dosimeters were typically set up to collect noise measurement data using three different settings for integrating noise (Table 1) to allow comparison of noise measurement results with the three different noise exposure limits referenced in most HHE reports, the OSHA Permissible Exposure Limit, OSHA Action Level, and the NIOSH Recommended Exposure Limit. During noise dosimetry measurements, noise levels below the threshold level were not integrated by the dosimeter for accumulation of dose and calculation of time-weighted average noise level. The dosimeters averaged noise at a rate ranging from one second to sixty seconds.

Table 1. Dosimeter settings

Parameters	OSHA AL	OSHA PEL	NIOSH REL
Response	Slow	Slow	Slow
Exchange rate (dB)	5	5	3
Criterion level (dB)	90	90	85
Threshold (dB)	80	90	80

Area noise levels and octave band noise frequency measurements (measurement of noise in either single octave band or one-third octave band noise frequencies) were measured with integrating sound level meters (SLMs) and octave band noise frequency analyzers. The SLMs were equipped with 0.5 or 0.25-inch random incidence microphones (Type 1). During measurements, the SLMs were either hand-held or mounted on a tripod at a height of approximately 4 to 6 feet.

Following dosimetry, SLM, or octave band measurements, noise data were either read directly from the instrument or downloaded to a personal computer for subsequent analysis. Instruments were calibrated before and after each day of use according to the manufacturers' instructions.