ACOUSTICAL - Pertaining to the science of sound, including the generation, propagation, effects and control of both noise and vibration.

DAILY NOISE EXPOSURE - See: "Partial Noise Exposure"

DECIBEL - The human ear responds in a logarithmic manner to sounds of varying intensity. The decibel is ten times the logarithm of the ratio of two sound levels. Using the decibel scale allows the vast range of human hearing response to sound levels to be expressed as 0 to 150 decibels instead of one to one million billion.

Decibel noise levels cannot be added arithmetically since they are logarithmic numbers. If one machine is generating a noise level of 50 dBA, and another similar machine is placed beside it, the level will increase to 53 dBA, not 100 dBA. Ten similar machines added will increase the sound level by 10 dBA, and one hundred machines will increase the sound level by 20 dBA.

dBA - The human ear is not as sensitive to low frequency sound as to high frequency sound. Sound level meters have an inbuilt weighting network termed the dBA scale that simulates the frequency response of the human ear. The dBA scale approximates the 40 phon equal loudness contour.

dBC - The dBC scale of a sound level meter is similar to the dBA scale defined above, except that at high levels of noise, the human ear frequency response is more linear. The dBC scale approximates the 100 phon equal loudness contour.

EQUIVALENT CONTINUOUS NOISE LEVEL, (L_{Aeq}) - Many noises such as that from road traffic, production machinery or construction equipment vary continually in level over a period of time. More sophisticated sound level meters incorporate an integrating electronic device that averages the A weighted sound pressure level over a period of time and then displays the energy average or L_{Aeq} noise level. Because the decibel scale is a logarithmic ratio the higher noise levels have far more sound energy. Therefore the L_{Aeq} level tends to indicate an average which is strongly influenced by short term, high level noise events. Hearing loss tends to relate closely to the L_{Aeq} noise level descriptor.

FREQUENCY - The number of oscillations or cycles of a wave motion per unit time, the SI unit being the Hertz, or one cycle per second.

HEARING LOSS - A general term used to refer to either Hearing Disability or Hearing Impairment. Compensable hearing loss is that Hearing Disability normally due to sensorineural damage to the inner ear, caused by occupational noise exposure or by trauma in the workplace. Percentage Loss of Hearing is a specific term that quantifies a measure of Hearing Disability.

HEARING IMPAIRMENT - The loss of hearing function, due to damage sustained by parts of the ear from a range of effects is termed Hearing Impairment. Hearing impairment is quantified by a medical audiogram in decibels of permanent hearing threshold shift at frequencies normally ranging from 500 to 4000 Hz. Contributing factors to hearing impairment include effects from disease, trauma, ageing (presbyacusis), recreational pursuits such as rifle shooting & loud music, and from occupational noise. A person must experience a hearing impairment of over 20 dB at several frequencies before he or she is considered to have a hearing disability.

HEARING DISABILITY - The resulting restriction in performance of work related duties due to all types of Hearing Impairment. The onset of Hearing Disability occurs when a person's Hearing Impairment exceeds 20 dB (approximately) at several frequencies. Hearing Disability can be quantified as a Percentage Loss of Hearing using "Tables for Determining Percentage Loss of Hearing" - 1982, or from "Improved Procedure for Determining Percentage Loss of Hearing", 1988, both published by the National Acoustic Laboratories.

IMPULSE NOISE - An impulse noise is typified by a sudden rise time and a rapid sound decay, such as may be caused by a hammer blow or explosion.

LOUDNESS - The degree to which a sound is audible to a listener is termed the loudness. Humans perceive a 10 dBA noise increase as a doubling of loudness and a 20 dBA noise increase as a quadrupling of the loudness.

MAXIMUM NOISE LEVEL, (L_{Amax}) - The root mean square (rms) maximum sound pressure level measured on the "A" scale of a sound level meter is the L_{Amax} noise level. The "Slow" response setting is usually selected for occupational noise exposure assessment.

NOISE - Noise is unwanted sound. Sound is wave motion within gases, liquids and solids.

NORMALISED DAILY NOISE EXPOSURE LEVEL (NDNEL), $L_{Aeq\ 8hr}$ -

The Normalised Daily Noise Exposure Level is the Equivalent Continuous Noise level averaged over an eight hour working day. Refer: AS/NZS 1269.1:2005 Section 9.3.

$$L_{Aeq,8h} = L_{Aeq,T} + 10\log_{10}\left[\frac{T}{8}\right] \qquad ...\text{dBA}$$

If the NDNEL varies from day to day, it may be averaged over a number of days or months to indicate the Normalised Daily Noise Exposure Level for a representative working day.

PARTIAL NOISE EXPOSURE (E_{AT}) - Hearing loss is due to the combined effect of both the L_{Aeq} level of a noise and the exposure period (T) in hours. The Partial Noise Exposure may be calculated as follows:

$$E_{AT} = 10^{\left(\frac{L_{Aeq}}{10}\right)}.4T.10^{-10} \qquad ...Pa^2hr$$

The **Daily Noise Exposure** of a worker is the arithmetic sum of the Partial Noise Exposures experienced during the working day. Refer to AS/NZS 1269.1-2005 Section 4.2.3 (c).

PEAK SOUND PRESSURE LEVEL (L_{peak}) - In decibels, is 10 times the logarithm to the base 10, of the ratio of the square of the maximum instantaneous sound pressure to the square of the reference sound pressure (20μPa). L_{peak} is not the same as the maximum rms level and is either unweighted or C-weighted according to the appropriate legislation.

PINK NOISE - Pink noise is a broadband noise with an equal amount of energy in each octave or third octave band width. Because of this, Pink Noise has more energy at the lower frequencies than White Noise and is used widely for Sound Transmission Loss testing.

PRESBYACUSIS - is age related hearing impairment. People over 50 years of age commonly experience a progressive loss of hearing, termed presbyacusis. Impairment occurs in the higher frequencies first . Consonants in speech, which carry the intelligibility of a conversation, are typically high frequency sounds. It follows that older people can often hear people talking but cannot understand what is being said.

QUIET - is defined in Australian Standard AS 1269 "Acoustics - Hearing Conservation" as "exposure over the relevant reference time period to an equivalent continuous .... sound pressure level of not more than 70 dBA and to maximum sound pressure levels not exceeding 80 dBA".

SOUND ATTENUATION - If an enclosure is placed around a machine, or a silencer is fitted to a duct, the noise emission is reduced or attenuated. Such attenuation is arithmetic. An enclosure that attenuates the noise level by 30 dBA, reduces the sound energy by one thousand times.

SOUND LEVEL CONVERSION, SLC_{80} - The SLC_{80} is a sound insulating rating for hearing protectors. Its numerical value represents the expected reduction of the dBC ambient noise level to a dBA noise level at the ear for 80 % of wearers.

SOUND PRESSURE LEVEL, L_p - The level of sound measured on a sound level meter and expressed in decibels, dB, dBA, dBC, etc..

$$L_P = 10.\log\left(\frac{P}{P_0}\right)^2 \qquad ...\,\text{dB}$$

where P is the root mean square (rms) sound pressure in Pascal and P_o is a reference sound pressure of 20 μPa. L_p varies with distance from a noise source.

SOUND POWER LEVEL, L_W - The Sound Power Level of a noise source is an absolute that does not vary with distance or with a different acoustic environment.

$$L_W = L_P + 10.\log A \qquad ...\,\text{dB, re}:1\text{pW}$$

where A is the measurement surface area in square metres in a free field.

STEADY NOISE. - Noise that varies in level by ± 3 dBA or less is considered as steady.

WHITE NOISE - White noise is broadband random noise whose spectral density is constant across its entire frequency range. The sound power is the same for equal bandwidths from low to high frequencies. Because the higher frequency octave bands cover a wider spectrum, white noise has more energy at the higher frequencies and sounds like a "hiss".