

Comparison of dB(A), dB(EQL) and Loudness with respect to Environmental Noise Assessment. Klaus Genuit, Prof. (HEAD acoustics GmbH, Ebertstr. 30a, 52134 Herzogenrath, Germany), Wade Bray (HEAD acoustics, Inc., 6964 Kensington Road, Brighton, MI 48116, USA), and Georg Caspary (HEAD acoustics GmbH, Ebertstr. 30a, 52134 Herzogenrath, Germany)

A pair of related tools useful for environmental noise assessment are time-varying psychoacoustic loudness, and an expression of sound pressure level in dB[SPL] weighted dynamically according to the contours of equal loudness rather than the static A-weighting. Conventional weightings applicable to sound pressure (dB[A], etc.) are fixed in spectral shape and intended for use over certain ranges of unweighted sound pressure level. Particularly for sounds with tonal content and within the general level range of the A-weighting, the authors propose a new spectral sound pressure weighting assembled from the Phon values of the complete set of equal-loudness contours calculated for each frequency within the human auditory range. It will be shown that although giving values numerically similar to those of the A-weighting, the dB[EQL] or Equal-Loudness weighting is situation-dependent rather than fixed, and better-represents subjective impressions at all frequencies. Although based on perceived loudnesses, the dB[EQL] sound pressure weighting is not a specific loudness measurement, does not consider critical band formation nor yield masking or psychoacoustic loudness data. Developed from the same basis as psychoacoustic loudness of sounds at different frequencies, the dB[EQL] and time-varying loudness together provide a bridge between conventional and psychoacoustic techniques.

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