

4.7.1: Introduction

Loudness is the human perception of sound pressure level (SPL). While there is a broad, general correlation between the two (a higher SPL is generally deemed to be “louder” than a lower SPL), this is strictly true only for tones of the same frequency and timbre. When comparing different frequencies, it is possible for one tone to be deemed louder than another even though its SPL may be lower. This is due to the varying sensitivity of the human hearing response across the range of audible frequencies. In general, humans are very sensitive to sounds in the upper midrange (1 to 5 kHz) and much less sensitive to bass frequencies, particularly deep bass well below 100 Hz. This effect can be investigated by comparing the perceived intensity of a reference tone (typically 1 kHz) to that of a secondary tone, adjusting the SPL of the second tone so that it is perceived to be “just as loud” as the reference tone. Early work this area was performed by Fletcher and Munson in the 1930s and then re-evaluated by Robinson and Dadson in the 1950s. The current ISO standard (ISO 226:2003) draws from the work of several researchers from around the world.

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