
Basic Glossary of Terms

BL: Speaker force factor or strength of the motor. Higher BL values mean larger forces are generated by electrical current flowing through the voice coil. It is the product of B (magnetic gap field strength) x L (Length of voice coil wire in the magnetic gap field). It is often stated in Tesla-Meters (T-M). Typical speaker BL ranges from 2 T-M to 20 T-M.

Cms: Mechanical compliance of the driver suspension of stated in mm/N

dB: Decibel. A unit of signal strength, actually the ratio or difference between two signals. The decibel is a logarithmic (rather than linear) measurement. For example, doubling the output of an amplifier yields a 3 dB increase in signal strength. See: SPL

Driver: A term often used to describe the unenclosed speaker. Other terms used are transducer, loudspeaker, or speaker.

DCR (Re): The DC (direct current) electrical resistance of the voice coil (Also known as Re) measured in Ohms. A speaker rated with an 8 ohm impedance will have a D.C.R. of about 6 - 7 ohms.

Fo (Fs): Resonance frequency of a driver when the maximum amount of energy is stored in the moving mass and suspension. Coincides with maximum impedance (Zmax). A sub-woofer may have an Fo of 20 Hz while a tweeter may have an Fo of 3,000 Hz.

Frequency Response: A range of frequency that a speaker produces, expresses in hertz and often given with a tolerance. Typical ranges are: Sub-woofer: 20-100Hz; Woofer: 40-500 Hz; Mid-range: 200-3,000 Hz; Voice range: 300-3,000 Hz; Tweeter range: 3,000-20,000 Hz; Full range: 20-20,000 Hz

Impedance: A type of resistance which includes the inductance of the voice coil during operation and is measured in ohms (Q). According to Ohms Law, it's the ratio of voltage (E) to current (I in an AC circuit. ($E/I = R$).

Most speakers are categorized as either 40 or 80. Matching the load impedance of a speaker to the source impedance of an amplifier (40 to 40, for example) helps maximize power transfer. Using a speaker with a lower impedance rating than the amplifier can damage the amplifier. Using a speaker with a higher impedance rating than the amplifier will not damage the amplifier but will produce less output from the speaker.

Mms: Mechanical mass of diaphragm cone assembly, including air load and is stated in Grams. Typical Mms are 0.3 grams for a tweeter to 120 grams for a sub-woofer.

Power Rating: A complex and often mis-stated specification. It is stated in Watts (W) and often referenced to an industry standard, such as EIA-426B or AES. The best ratings are created using the type of signal or program material used in the actual application. Ratings can be defined relative to a maximum distortion, mechanical bottoming (soft parts hitting hard parts), power compression (when more power in does not create more sound out), or when the speaker "blows" (stops working altogether). Power ratings can vary from 0.1 watt for small speakers to over 1000 watts for large speakers.

Qts: Q of driver at F_s considering all driver losses. Combination of mechanical (Q_{ms}) and electrical (Q_{es}) damping that occurs in a loudspeaker. Most loudspeakers have a Q_{ts} from 0.3 to 1.0.

Sd: Surface area of the speaker cone stated in cm^2 . A 4" (100mm) speaker has an Sd of approximately 55 cm^2 .

Sensitivity: The measurement of output for a given input, usually expressed in decibels (dB) SPL with 1 Watt input measured at 1 Meter distance. This approximately correlates to the efficiency of the loudspeaker's ability to turn electrical energy (signal) into acoustic energy (sound). Most speakers have a sensitivity of 75 -100 dB SPL with 1 watt /1 meter.

Sound pressure level (SPL): Technical term for what your ears interpret as loudness or volume. Expressed in decibels (dB) above the threshold of hearing at 0 dB. Background music or a nearby conversation could have an SPL of 50-60 dB. A rock concert could get up to 120 dB.

Tolerance: Most speaker parameters are typically $\pm 20\%$ or ± 5 dB per frequency response and sensitivity.

Vas: The volume of air having the same acoustic compliance as the driver suspension. This relates to the compliance of the speaker suspension (C_{ms}) and the size of the speaker cone (Sd). It is expressed in units of ft^3 or Liters. This is an important specification in determining loudspeaker enclosure volume. A small 2" speaker may have a V_{as} of 0.2 Liters while a 12" woofer may be 150 Liters.

Xmax: The Maximum excursion of a speaker usually stated in Millimeters (mm). It is roughly equal to the amount of voice coil wire above or below the front plate of the speaker. It can vary from 0-25mm depending on the speaker type.