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Shure Earphone Technology Glossary

Balanced Armature Speaker (SE210, SE310, SE420, SE530)	A type of speaker in which the diaphragm is moved by a small drive pin. This design has very low moving mass which allows it to respond more quickly to changes in the signal (called transient response). Balanced armature speakers typically offer smaller size, higher output, extended high frequency response and better high frequency detail when compared to dynamic speakers.
Crossover (SE420, SE530)	An electronic device that divides the audio signal into separate streams consisting of different frequency ranges. In the most typical two-way configuration, one stream consists of only the low frequencies, while the other consists of the midrange and high frequencies. The low-frequency stream is routed to a speaker whose size and performance characteristics have been optimized for bass. The mid/high-frequency stream is sent to a speaker that is smaller, with better response to signal transients.
Driver (single) (E2c, SE210, SE310)	An earphone design in which one speaker reproduces the entire range of frequencies for each ear.
Driver (dual) (SE420)	An earphone design with two speakers in each ear. One speaker is optimized to reproduce bass and the lower portion of the midrange, while the other is optimized for the upper portion of the midrange and the treble.
Driver (triple) (SE530)	An earphone design with three speakers in each ear. In the SE530 Sound Isolating Earphones, two small woofers take the place of one larger woofer and work together to reproduce bass and the lower portion of the midrange. The third speaker (the tweeter) reproduces the upper portion of the midrange and the treble.
Dynamic Speaker (E2c)	A speaker that uses a diaphragm, magnet and wire coil to convert an electrical signal into sound. The coil is attached directly to the back of the speaker diaphragm, so that when the coil moves, the diaphragm moves with it. Dynamic speakers are used in the majority of headphones, earbuds and loudspeakers.



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Earbuds	Earbuds are miniature headphones that fit into the contours of your outer ear. The body of the earbud is usually round, but sometimes a plastic or rubber appendage is attached to minimize the discomfort of the hard plastic shape.
Earphones	Earphones actually fit into your ear canal and are held in place by a soft sleeve made of rubber, foam or plastic. Some earphones offer a choice of sleeves in different sizes or materials to increase wearing comfort.
Fit Kit	The assortment of interchangeable sleeves included with Shure Sound Isolating Earphones. By selecting from sleeves that are different sizes, shapes and materials, the user is able to achieve a secure and comfortable fit that results in optimum sound quality and allows the earphones to stay in place during exercise.
Frequency Response	The range of frequencies (measured in Hertz) that a pair of earphones can reproduce, within a specified tolerance envelope. Human hearing is limited to a range of 20 Hertz to 20,000 Hertz.
Headphones	Headphones usually use speakers that sit on the outside of your ear, held in place by padding and some sort of headband, neckband or earclip.
Hi-Definition MicroSpeaker (SE210, SE310, SE420, SE530)	An alternative to the dynamic speaker, offering both superior performance and smaller size. The Hi-Definition MicroSpeaker has significantly lower mass than a dynamic speaker, resulting in superior transient response for better high-frequency clarity and detail. The audio signal flows through a coil of wire which causes a magnetized metal bar (shaped like a diving board) to vibrate up and down. A pin connected to the bar pushes a diaphragm in and out which creates sound waves.
Highs/Treble	The higher portion of the audible frequency range (from 10,000 Hertz to 20,000 Hertz) which includes cymbals and the high-frequency components of other sounds. These “overtones” provide texture, accuracy and detail in vocals and instruments. A lack of treble causes music to sound flat and dull, while too much treble is like too much light – dazzling at first, but soon fatiguing and annoying. Generally, a speaker that reproduces treble well will not be as good at reproducing bass.



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Impedance	<p>The opposition to the flow of an audio signal, measured in ohms. Earphones with low impedance (less than 40 ohms) play louder at a given volume setting, but they make the headphone amplifier work harder. At high volume settings, this may cause the amplifier to “run out of gas” and produce distorted bass. Earphones with high impedance don’t make the headphone amplifier work so hard, so there is less chance of distorted sound, but they don’t play as loud at a given volume setting. Shure earphones combine low impedance (20-40 ohms) for compatibility with portable devices, plus high sensitivity so comfortable listening levels can be achieved when the device is operating in the middle of its volume setting range.</p>
Lows/Bass	<p>The lower portion of the audible frequency range (from 20 Hertz to approximately 300 Hertz) which includes deep tones such as drums. A lack of bass causes music to sound thin and uninteresting, while too much bass sounds boomy and dark and obscures the mids and highs. Generally, a speaker that reproduces bass well will not be as good at reproducing delicate high frequency details.</p>
Microphonics	<p>The tendency for a component to convert mechanical vibration into sound, thus behaving like a microphone. The term is most often used to describe the tendency for a cable or electronic component to generate audible noise through the earphones when it is handled or tapped. Microphonics can be minimized through careful selection of the cable and attention to the connection between the cable and the earphone speakers.</p>
Mids	<p>The middle portion of the audible frequency range (from 300 Hertz to approximately 10,000 Hertz) which includes vocals and the fundamental tones of most instruments. A lack of midrange content makes music sound lifeless, robbing vocals and instruments of their character and making them sound unnatural. Too much midrange makes the music sound nasal, almost like a paging system.</p>
Noise-canceling (or Noise Cancellation)	<p>An electronic process that reduces noise in an audio signal. A microphone located inside of each headphone earcup samples the ambient noise.</p>



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	<p>Electronic circuitry (powered by a battery) attempts to create an accurate “mirror-image” of the noise signal and injects increasing amounts of it into the music signal. This “inverse noise” can cancel out steady or droning noise at low frequencies, although the process is far less effective at blocking midrange noise such as speech or random noise such as traffic.</p>
Sensitivity	<p>A measure of how loud the earphones will be when fed a certain audio signal level from the music player. The standard measurement for all types of headphones is at one milliwatt (.001 watt) of power. A typical specification might read “102 dB SPL/mW” which means that a Sound Pressure Level of 102 decibels is produced when the headphones are fed one milliwatt (.001 watts) of power by the music player. Earphones that can produce a higher output level with the same amount of power are said to be more sensitive or more efficient. Shure earphones are considerably more sensitive than standard earbuds and can achieve comfortable listening levels at lower volume settings.</p>
Sound	<p>Subtle, rhythmic variations in air pressure that are converted into electrical signals by the ear. The pattern of the signals is identified in the brain.</p>
Sound Isolating (or Sound Isolation)	<p>Refers to earphones that fit into the ear and form a snug seal, reducing the amount of ambient noise that reaches the ear. The material, shape and fit of the earphone and its sleeve are critical to achieving good sound isolation.</p>
Sound Signature	<p>A specific sound quality generated by audio components configured in specific ways. This results in particular sonic characteristics – ‘warmth’, ‘detail’, ‘spaciousness’, etc. – that interact with the audio characteristics of the music and the listener’s personal preferences to define the overall listening experience. Earphones that emphasize the high frequencies are often referred to as “accurate,” “bright” or “crisp.” Not enough of the high frequencies results in sound that is “dull” or “murky,” while too much might be termed “harsh.” Earphones that emphasize the midrange are often described as “forward,” while the midrange itself might be termed “smooth” or “natural.” Too much midrange sounds “honky,” while not enough sounds “lifeless.”</p>



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	<p>Earphones that emphasize the low frequencies are often referred to as “warm” or “rich.” Too much bass is usually termed “boomy,” while not enough bass results in sound that is “thin” or “tinny.”</p>
Soundstage	<p>The apparent sense of spaciousness that is often associated with live recordings. Earphones that do a better job of reproducing the subtle acoustic cues that define the room in which the music was performed are often said to have more “spaciousness” or a “wider soundstage.” A wide soundstage can add more realism to the listening experience, as if you are on stage with the performers.</p>
Speaker	<p>The part of an earphone that actually produces sound. The speaker converts the audio signal coming from the headphone jack on the music player (electrical energy) into sound waves that can be heard (acoustic energy).</p>
Spectrum	<p>The entire gamut of variations of energy of a particular type, such as light or sound. In the context of sound, the spectrum refers to the complete range of frequencies - from 20 Hertz to 20,000 Hertz - that can be detected by the human ear.</p>
Transient Response	<p>The ability of a speaker to change its speed and direction to accurately reproduce complex or rapidly-changing audio signals. This requires the speaker to have low moving mass, so that it can accelerate and decelerate faster. Earphones that offer better transient response can accurately reproduce sharp, impulsive sounds such as a drum beat in a way that is termed “tight,” and they reveal more detail in subtle instruments like the sound of fingers strumming an acoustic guitar. Poor transient response causes residual movement of the speaker after the sound has actually ended which dilutes the drum beat to sound more “boomy” and also may cover up other, more subtle sounds.</p>
TruAcoustic Speakers (SE420, SE530)	<p>Shure’s name for multiple Hi-Definition MicroSpeakers combined with a crossover. By dedicating speakers to different frequency ranges, the music becomes much more lively and dynamic. Vocals and instruments take on added texture and realism, and there is a heightened sense of spaciousness</p>



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	that makes it easier to mentally position where the players are on the stage.
Tuned BassPort (SE420)	An internal vent in the speaker assembly which improves airflow around the speaker. Specifically, the port allows air to move in behind the speaker when it pushes air toward your ear and allows air to move back out when the speaker moves away from your ear. This allows the speaker diaphragm to move in and out more freely, thus improving bass response with no increase in the size of the speaker or its enclosure.
Tweeter	A speaker that is optimized for the reproduction of the upper portion of the midrange and treble.
Woofers	A speaker that is optimized for the reproduction of bass and the lower portion of the midrange.

For More Information

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