

MIC SPECS IN PLAIN ENGLISH (a simplified guide)

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TYPE: Condenser, dynamic or ribbon.

These terms refer to the way the microphone converts sound into an electrical signal. Each type has its own "sound" and application.

Condenser: High-fidelity, detailed sound with lots of clean high frequencies. Popular for studio vocals, stage vocals, acoustic instruments and cymbals. Can be miniaturized.

Condenser microphones require special power to operate, either a battery or phantom power. Phantom power is 12 to 48 volts DC, and is supplied by a mixer or by a phantom power supply. Phantom power is sent to the mic on its mic cable; no extra wiring is needed.

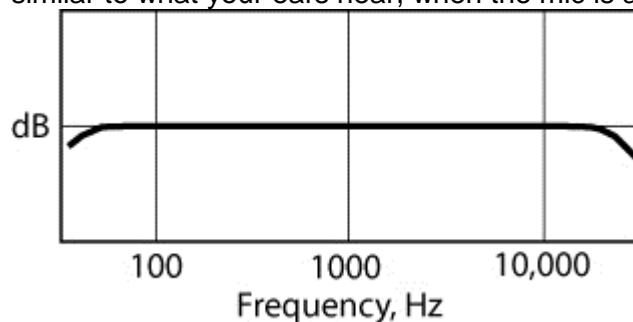
Dynamic: Good sound quality, rugged. Popular for guitar amps and drums. Does not require phantom power.

Ribbon: Warm, smooth sound quality. Delicate. Popular for horns and guitar amps. Does not require phantom power.

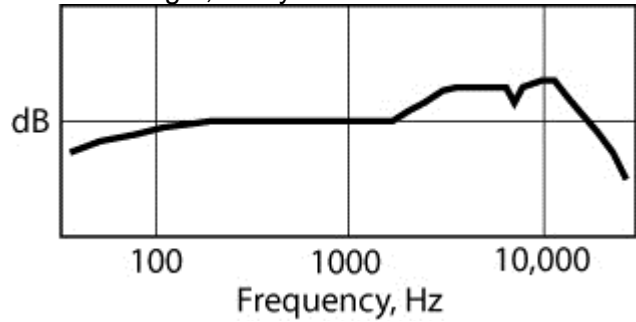
FREQUENCY RESPONSE: The lowest and highest frequencies that the mic can pick up well. A frequency response from 20 Hz to 20,000 Hz covers all the frequencies we can hear. 80 Hz to 15,000 Hz is adequate for most instruments and vocals. 40 Hz to 10 kHz is adequate for bass instruments.

If the mic's data sheet shows a frequency response graph, the shape of the dark line or "curve" on the graph indicates how the mic responds to bass, midrange and treble frequencies. The right area of the graph is treble; the left area is bass, and the middle area is the midrange. On the graph, the center horizontal line is called "0 dB".

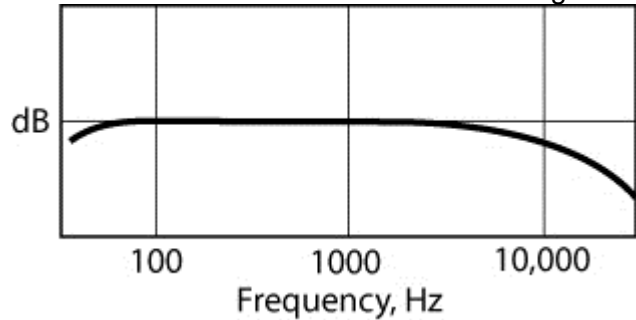
A curve that is mostly a horizontal line is called "flat". It tends to sound accurate, natural or similar to what your ears hear, when the mic is about 2 feet away.



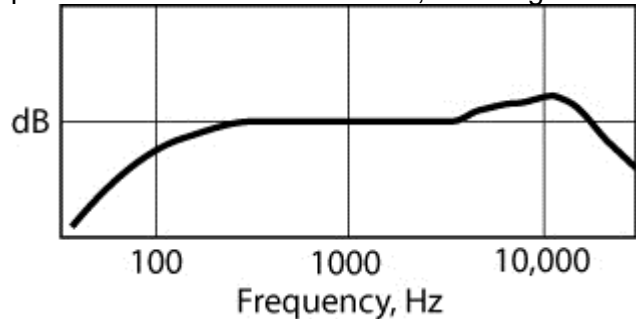
A curve that rises above 0 dB toward the right side of the graph has a "presence peak". It tends to sound bright, trebly or articulate.



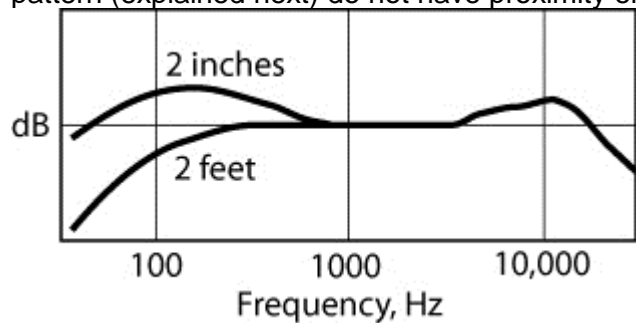
A curve that falls below 0 dB toward the right side of the graph tends to sound mellow.



A curve that falls below 0 dB toward the left side of the graph is called a low-frequency rolloff. It's desirable to roll off the low frequencies below the lowest note that the instrument or vocal produces. That reduces rumble, handling noise and feedback.

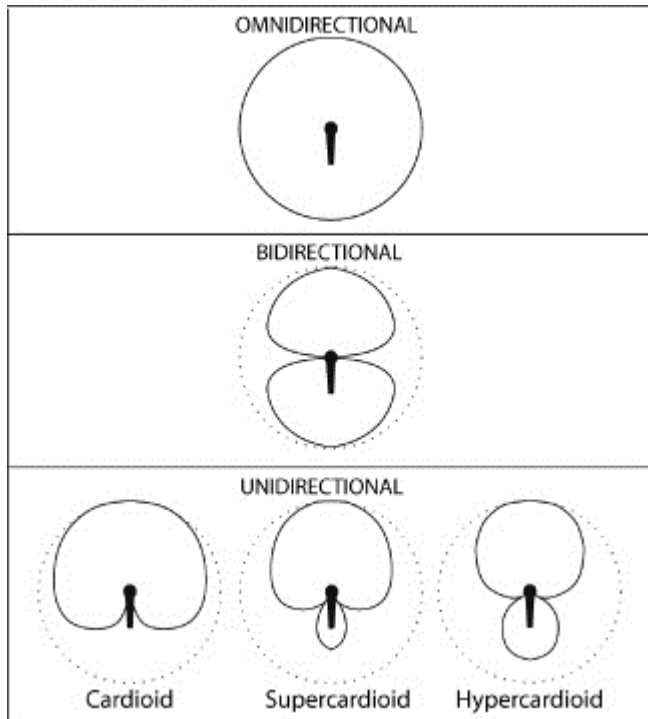


Proximity effect: Most microphones boost the bass when used up close. That adds a warm, full tone quality, but it also exaggerates the bass. Microphones with an omnidirectional polar pattern (explained next) do not have proximity effect.



POLAR PATTERN:

Also called directional pickup pattern. It's a graph of how the mic picks up sounds coming from different directions.



Cardioid: The mic picks up best in front of the mic. Partly rejects sounds approaching the sides or rear of the mic. Rejects sound best toward the rear.

Supercardioid: Picks up best in front of the mic. Partly rejects sounds approaching the sides or rear of the mic. Has a narrower or more selective pickup than cardioid.

Hypercardioid: Picks up best in front of the mic. Partly rejects sounds approaching the sides or rear of the mic. Has a narrower or more selective pickup than supercardioid.

Omnidirectional or omni: Picks up equally well in all directions. Unlike the other patterns, omni has no proximity effect (no up-close bass boost). Omni also has less pickup of mechanical vibrations and wind noise.

Bidirectional or figure-8: Picks up best in two directions -- in front of and behind the mic -- and rejects sounds to the sides.

Use cardioid, supercardioid, hypercardioid, bidirectional, or an instrument-mounted omni when you want to reject background noise, room acoustics and feedback. A mic with one of those patterns tends to pick up mostly what it is aiming at, and not so much of everything else. Use an omnidirectional mic when you want to pick up everything around the microphone.

IMPEDANCE: An electrical characteristic of a microphone. Use low-impedance microphones (under 300 ohms) to prevent hum pickup if you use mic cables over 15 feet long.

MAXIMUM SPL: The loudest sound that the mic can pick up without distorting. A maximum SPL spec of 120 dB SPL is good, 130 dB SPL is very good, and 140 dB SPL or higher is excellent. 120 dB SPL is painfully loud.

SELF-NOISE: A measure of how noisy the microphone is. A self-noise spec of 25 dBA is good, 20 dBA is very good, and 15 dBA or less is excellent. A self-noise spec of 30 dB is very good if the mic is mounted directly on an instrument because the instrument's signal is so much louder than the mic's noise.

SIGNAL-TO-NOISE RATIO: Another measure of how noisy the microphone is. A signal-to-noise spec of 69 dB is good, 74 dB is very good, and 79 or higher is excellent. A signal-to-noise spec of 64 dB is very good if the mic is mounted directly on an instrument because the instrument's signal is so much louder than the mic's noise.

CONNECTOR: Professional mics have a male XLR connector, which has 3 pins or contacts arranged in a triangle.

SIDE-ADDRESSED: The microphone picks up best from its side. You aim the side of the mic at the sound source. Most large-diaphragm condenser mics are side-addressed.

END-ADDRESSED: The microphone picks up best from its end. You aim the end of the mic at the sound source. Most "pencil" or "stick shaped" mics are end-addressed.

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