Understanding Specifications – A Few Basics

In audio, we need specifications to help us understand how microphones, speakers, amplifiers, and signal processors will function, operate, and perform under certain conditions within our sound systems. Specifications can be meaningful or exaggerated and often can be very confusing. For beginner audio technicians or musicians to completely understand audio-related specifications – we recommend that they perform additional research on the subject. The information and notes below will only give you a basic knowledge of what to look for when evaluating Speaker and Microphone Specifications / Frequency Response.

When looking at specifications, you may see "typical performance." This can mean a couple of things. First, this type of specification may not be "binding" and promises no guarantee of what "typical" means for this particular equipment. Secondly, the words typical performance could provide enough insight to tell you what could be expected under "typical" or "normal" conditions. See the examples below.

Below are the technical specs for an EV passive speaker cabinet. A few important specs to look for would be:

- **→ The frequency response of the cabinet is 57Hz – 16kHz**
- **→ Max SPL is 130dB (which is pretty loud)**
- **→ The Horn Coverage is 90 degrees Horizontal X 60 degrees Vertical (90 X 60).**
- **→ Power Rating – 1200 Watts (but doesn't state if you can constantly push the cabinet at 1200W or not?).**
- **→ Crossover Frequency is 1700Hz.**
- **→ Tells you the size and weight, power consumption.**

All the other specs would not be useful under most circumstances especially if you will be using the proper size power amplifier to drive this speaker cabinet.

Technical specifications

Courtesy of ElectroVoice

Frequency response (-3 dB)[1]:	57 Hz - 16 kHz
Frequency range (-10 dB)[1]:	51 Hz - 20 kHz
Maximum SPL[2]:	130 dB
Coverage (H x V):	90° x 60°
Power rating:	1200 W
LF transducer:	EVS-12M 300 mm (12 in)
HF transducer:	DH-1L 1-inch titanium compression driver
Crossover frequency:	1700 Hz
Connectors:	(1) Stereo RCA Input, (2) XLR/TRS combo jack, and (1) XLR
Enclosure:	Polypropylene
Grille:	18 AWG steel with powdercoat
Suspension:	(3) M10 suspension points
Color:	Black or white
Dimensions (H x W x D):	629 mm x 363 mm x 344 mm (24.8 in x 14.3 in x 13.6 in)
Net weight:	15.6 kg (34.4 lb)
Shipping weight:	17.7 kg (39.1 lb)
Power consumption[3]:	100 - 240 V~, 50 - 60 Hz, 1.2 - 0.6 A

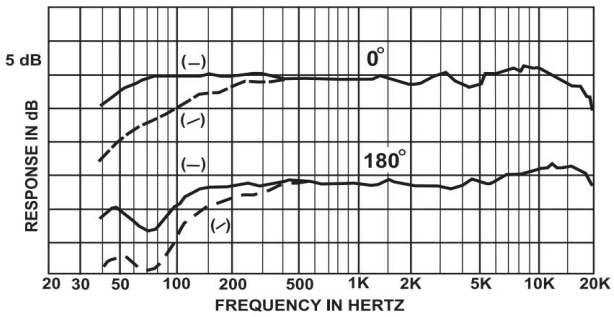
[1]Full-space measurement using music DSP preset.
[2]Maximum SPL is measured at 1 m using broadband pink noise at maximum output.
[3]Current rating is 1/8 power.

ElectroVoice Speaker Cabinet ELM-200 12P Specifications

Specifications – Electro-Voice RE-20 Microphone

What you are looking for with this Frequency Response Spec is at Zero Degrees (facing the mic element) you would get a more balanced response from the mic – a "Flatter" response, and less dipping of bass response (see 180 degrees).

Frequency Response:



Below, some of the important technical specs would be that the RE-20 mic is a Dynamic, has a Cardioid Polar Pattern, and the Frequency Response is 45Hz-18,000Hz (a great mic for vocals and instruments).

Technical Specifications:

Element Type:	Dynamic
Frequency Response:	45 Hz - 18,000 Hz
Polar Pattern:	Cardioid
Impedance:	150 ohms balanced
Sensitivity, Open Circuit Voltage, 1 kHz:	1.5 mV/pascal
Hum Pickup Level, typical (60 Hz/1 millioersted field):	-130 dBm
Polarity:	Pin 2 will be positive referenced to Pin 3 with positive pressure on diaprhagm

The polar pattern used for microphones (below) illustrates the directionality of a microphone, and the points where the microphone is the most sensitive to sounds.

Polar Patterns: More info regarding Microphone Polar Patterns – see Handouts.