A microphone is an acoustic-to-electric transducer or sensor that converts sound into an electrical signal. Most microphones use the change of capacitance caused by the diagrapham mechanical vibration to produce an electrical voltage signal. In a condenser microphone, the diaphragm acts as one plate of a capacitor, and the vibrations produce changes in the distance between the plates. There are two types of microphones of this kind: Pre-polarized Microphones and 200V Polarized Microphones.

Pre-polarized Microphones

A nearly constant charge is maintained on the capacitor. As the capacitance changes, the charge across the capacitor does change very slightly, but at audible frequencies it is sensibly constant. Pre-polarized Microphones do not need a bias-voltage supply.

200V Polarized Microphones

There is no charge maintained on the capacitor, while there would be 200V bias-voltage between the plates. It would be necessary to have a 200V bias-voltage supply for the microphone. This type of microphone cannot tolerant high humidity. It is expected to be stored in the package to prevent humidity. But this type of microphone is much more stable and its operating temperature could reach up to 150 ℃.

Measurement microphones can be divided into three groups: Free-field, Pressure-field, and Random-incidence.

The difference of the testing results by three types of measurement microphones would be smaller than 0.3 dB when the frequency to be measured is lower than 5000Hz; while the difference could be larger than 10 dB if the frequency to be measured is higher than 16000 Hz. So it is crucial to choose the right microphone to get an accurate measurement result.

Free-field Microphones

A microphone can change the sound field in which it is placed. A free-field microphone is designed to compensate for the influence of its presence in the sound field. So it can measure the sound pressure as it exists before the microphone is introduced into the sound field and can be used in such environments as outdoors, anechoic room, or reverberation room.

Pressure-field Microphones:

A pressure-field microphone can measure the sound pressure existing on the diaphragm of the microphone. It can be used in a coupler environment such as an ear simulator or to test the sound pressure on a surface.

Random-incidence Micophones

Only ANSI stnadards request for random-incidence microphones. A random-incidence microphone may be required to make the measuremnts according to ANSI standards.