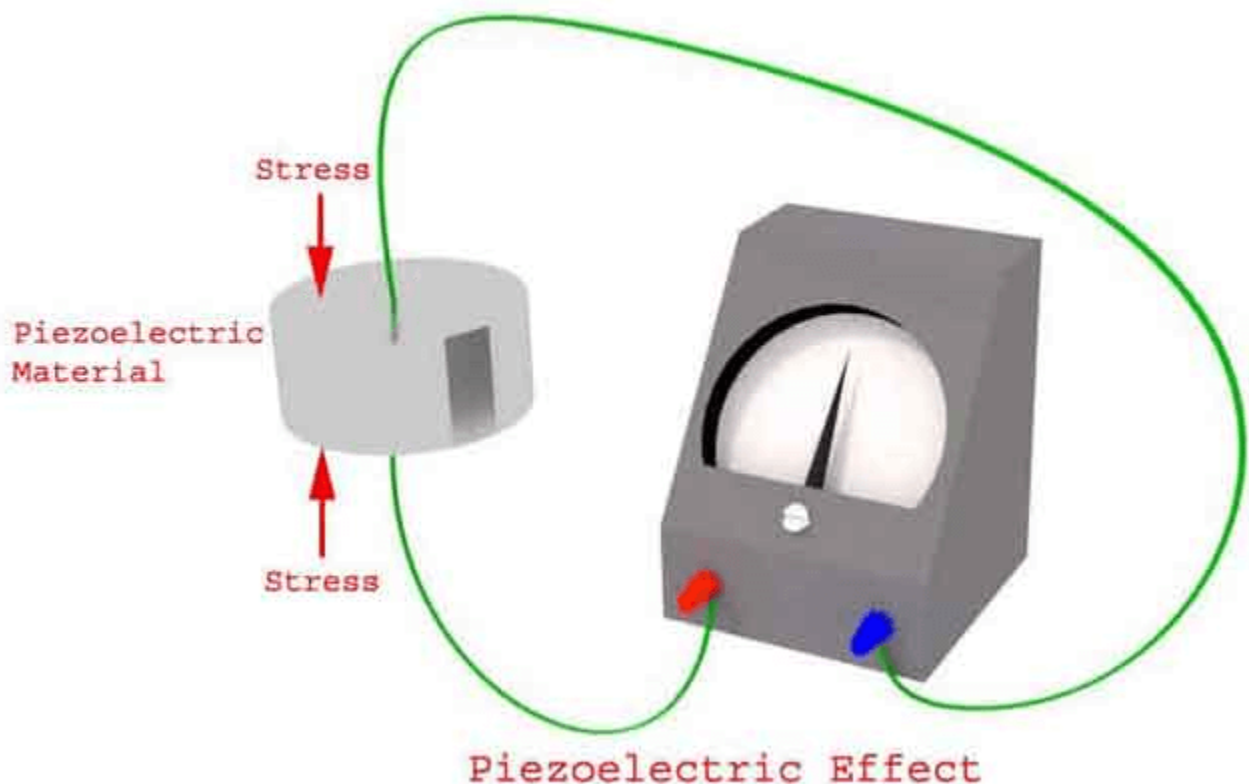


What is Piezoelectric Transducer

A **piezoelectric transducer** (also known as a piezoelectric sensor) is a device that uses the piezoelectric effect to measure changes in acceleration, pressure, strain, temperature or force by converting this energy into an electrical charge.

A transducer can be anything that converts one form of energy to another. The piezoelectric material is one kind of transducers. When we squeeze this piezoelectric material or apply any force or pressure, the transducer converts this energy into voltage. This voltage is a function of the force or pressure applied to it.

The electric voltage produced by a piezoelectric transducer can be easily measured by the voltage measuring instruments. Since this voltage will be a function of the force or pressure applied to it, we can infer what the force/pressure was by the voltage reading. In this way, physical quantities like mechanical stress or force can be measured directly by using a piezoelectric transducer.



Application of Piezoelectric Materials

Using piezoelectric materials, piezoelectric transducers can be used in a

variety of applications, including:

1. In microphones, the sound pressure is converted into an electric signal and this signal is ultimately amplified to produce a louder sound.
2. Automobile seat belts lock in response to a rapid deceleration is also done using a piezoelectric material.
3. It is also used in medical diagnostics.
4. It is used in electric lighter used in kitchens. The pressure made on piezoelectric sensor creates an electric signal which ultimately causes the flash to fire up.
5. They are used for studying high-speed shock waves and blast waves.
6. Used infertility treatment.
7. Used in Inkjet printers
8. It is also used in restaurants or airports where when a person steps near the door and the door opens automatically. In this, the concept used is when a person is near the door pressure is exerted person weight on the sensors due to which the electric effect is produced and the door opens automatically.

Examples of Piezoelectric Material

The materials are :

1. Barium Titanate.
2. Lead zirconate titanate (PZT).
3. Rochelle salt.

Piezoelectric Transducer Advantages

The advantages of piezoelectric transducers are:

1. No need for an external force
2. Easy to handle and use as it has small dimensions
3. High-frequency response it means the parameters change very rapidly

Piezoelectric Transducer Disadvantages

The disadvantages of piezoelectric transducers are:

1. It is not suitable for measurement in static condition
2. It is affected by temperatures
3. The output is low so some external circuit is attached to it
4. It is very difficult to give the desired shape to this material and also desired strength