

## PIEZO COPOLYMER COAXIAL CABLE

### SPECIFICATIONS

- ◆ Coaxial Design Piezo Sensor
- ◆ Shielded Construction
- ◆ Ideal for Linear Application
- ◆ Rugged
- ◆ Water Resistant
- ◆ Piezo Film Technology

**Piezo Cable** is another form of Piezo polymer sensors, designed as a coaxial cable, the Piezo polymer is the “dielectric” between the center core and the outer braid. When the cable is compressed or stretched, a charge or voltage is generated proportional to the stress.

Piezo cable has a number of advantages in certain applications. Due to its coaxial design, the cable is self-shielded, allowing its use in a high EMI environment. The Piezo cable can be spliced to passive coax, using standard coax splice techniques. It is extremely rugged and will stand up to heavy loads. Its linear format makes it ideal for monitoring large areas.

Two versions of the Piezo cable are offered, copolymer and spiral. With the copolymer version, a special version of the piezo material is extruded directly onto the inner conductor and then polarized. With the spiral wrap, strips of the PVDF film are double helically wound around the inner conductor. The copolymer is a much more expensive raw material and is available on a more limited basis than the standard PVDF.

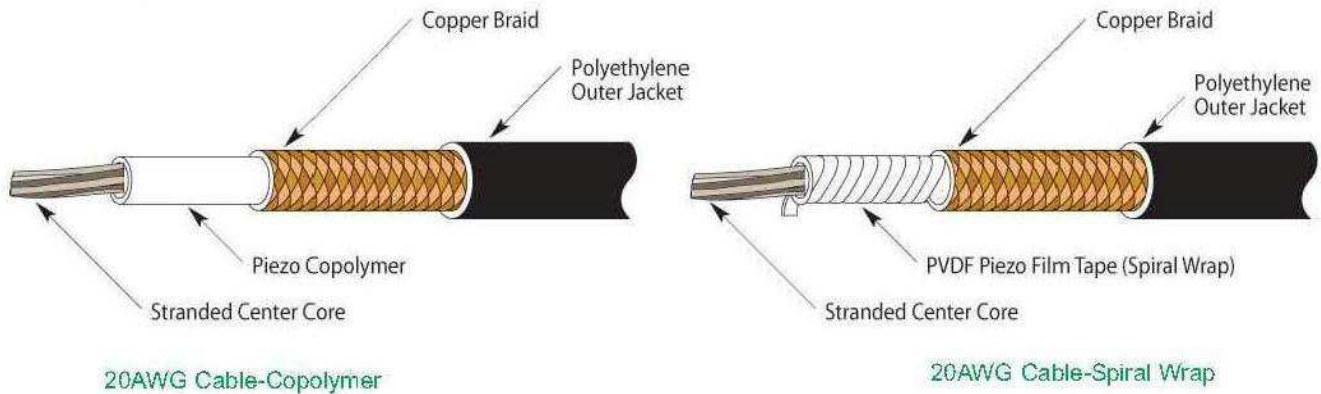
### FEATURES

- ◆ Passive, long length sensor
- ◆ Very tough, water resistant and flexible
- ◆ Temperature stability to 85°C
- ◆ Self-shielded coaxial construction
- ◆ High voltage response
- ◆ Low impedance per unit length
- ◆ Field repairable
- ◆ Simplified interconnections

### APPLICATIONS

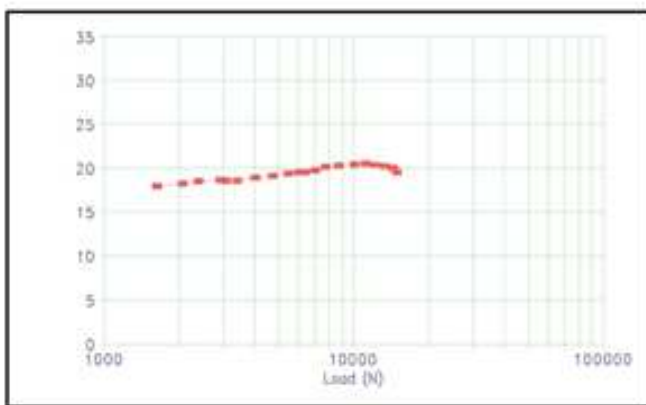
- ◆ Perimeter intrusion detection
- ◆ Safety and security fencing
- ◆ Door edge / vehicle bumper switch
- ◆ Cable tampering detector
- ◆ Traffic classification / counting
- ◆ Weather sensing (rain & hail)
- ◆ Structural NDT, strain, vibration
- ◆ Underwater acoustics
- ◆ Patient mattress monitor
- ◆ Sports scoring & foul line detection

CONSTRUCTION

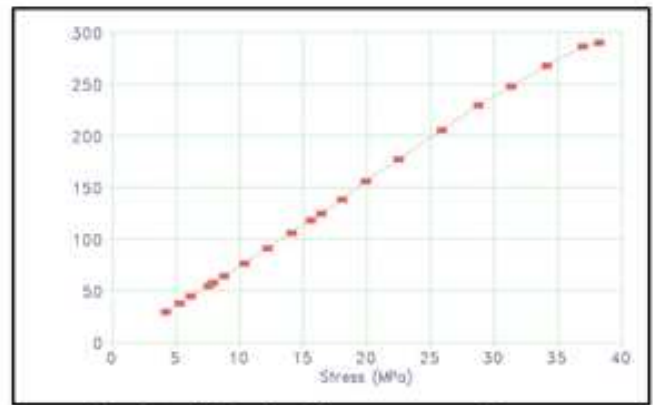


SPECIFICATIONS

Typical Properties	Units	Spiral Cable	Copolymer Cable
Outside Diameter	mm	2.69	2.72
Capacitance @ 1 kHz	pF/m	950	655
Weight	Kg/km	14.5	15.5
Resistance (Shield)	DCR/km	47	47
Tangent Delta	@ 1 kHz	0.016	0.017
Hydrostatic Piezo Coefficient	pC/N	20	15
Hydrostatic Piezo Coefficient	Vm/N		$150 \times 10^{-3}$
Resistance (Center)	DCR/km	31	31

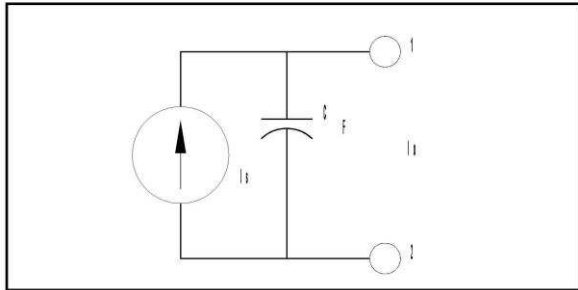


Typical Sensitivity vs. Load

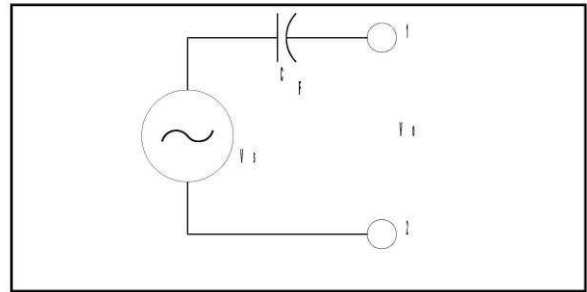


Typical Peak Charge vs. Stress

EQUIVALENT CIRCUIT



Current Source

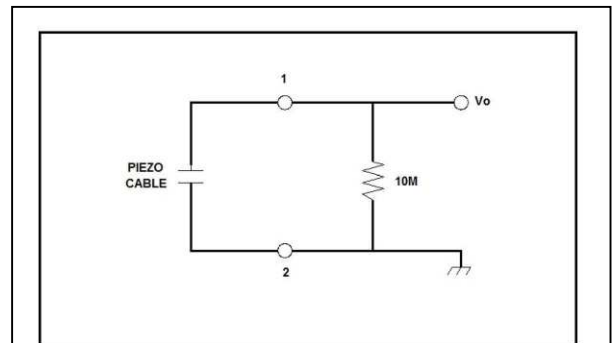


Voltage Source

TYPICAL INTERFACE CIRCUITS

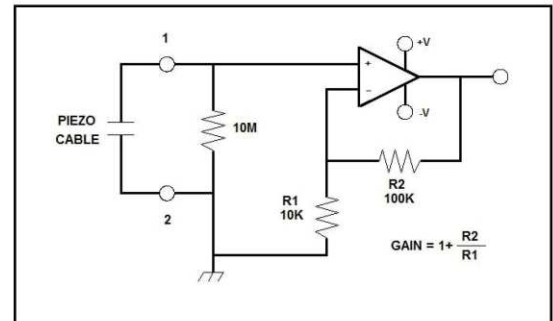
Example 1:

- Taxiway sensor (100 m cable)
- Large impact force (aircraft or truck)
- Low frequency event (0.1...10 Hz)



Example 2:

- Fence sensor (1 km cable)
- Small vibration signals (intruder)
- Higher frequency (10 Hz...10 kHz)



Example 3:

- Step switch mat (1 m cable)
- Foot pressure
- Low frequency (0.1 Hz...100 Hz)

