

## Typical Applications of PVDF Sensors

### Computers

Keyboard keypad  
Interactive touch screen  
Ink-jet printer — ink drop generation and detection  
Copier paper path switch

### Flow/Level Sensors

HVAC air flow  
Solid-state fluid level

### Security

Passive infrared sensor  
Glass break detector  
Floor/mat sensor

### Weather Sensors

Rain intensity  
Hail detection  
Wind velocity

### Oil Exploration

Hydrophone  
Seismic geophone

### Medical Diagnostics

Apnea monitor  
Blood-pressure cuff  
Pulse counter  
Respiratory air flow

### Ultrasound

Prostate  
Transdermal  
Coronary arterial  
Breast

### Implants

Pacemaker activity monitor  
Vascular graft monitor  
Micropump

### Automotive

Air-bag crash sensor  
Occupancy seat sensor  
Active suspension  
Keyless entry

### Music/Audio Equipment

Guitar pickup (transmits vibrations to amplifier)  
Drum trigger (transmits vibrations to amplifier)  
Tweeter  
Microphone

tray to make sure the product, such as a can of soda, is being dispensed properly. The absence of an object hitting the sensor triggers the “out of order” sign to light up.

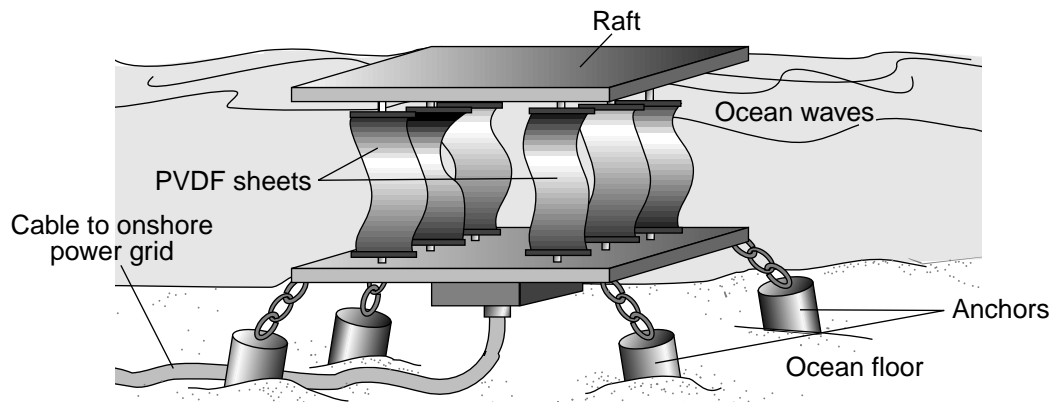
### Future Applications

The table at right summarizes many of the current applications of PVDF film. In addition to these, researchers are continually developing new uses for the material. For instance, one researcher has developed a tiny, solar-powered, ant-size robot. The legs of this tiny robot are made of piezoelectric materials. Armies of these robots could be released into pipes to detect hazardous materials or in hospital radiation labs to monitor radiation levels.

The diagram below illustrates another promising innovation: a power station that harnesses the

energy of ocean waves. A series of giant PVDF sheets is attached to a raft that is anchored to the ocean floor. The motion of the waves bends the sheets, and the resulting voltage is relayed to an onshore power station. Hydro-

piezoelectricity, as it is called, shows considerable potential as a low-cost, renewable, non-polluting source of energy. Other benefits of piezoelectric sensors may be limited only by the imagination.



Giant sheets of PVDF can be used to harness the energy of ocean waves.