

SMART LAYER® SENSORS

Our patented SMART Layer® is a thin flexible dielectric film with an embedded network of pre-positioned piezoelectric actuator/sensors. Lighter than traditional wiring, it is easy to install on new or existing structures. The SMART Layer® can incorporate additional sensor types such as strain and temperature, making it ideal for multimodal sensing (MMS). The SMART Layer® can either be surface-mounted on existing structures or integrated into composite structures during fabrication, providing built-in nondestructive assessments of the internal and external state of the structure.



STANDARD SMART LAYER®

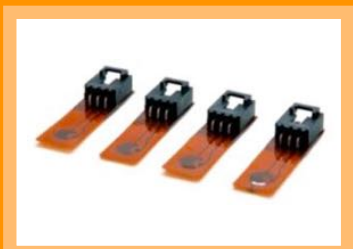
Multi-sensor SMART Layer® strips have predetermined sensor spacing, allowing for easy installation and precise sensor spacing.



GRADE SPECIFICATION TABLE



| | FEATURES | UNITS | VALUES |
|------------------------------|--------------------------------------|---------------------|------------------------|
| BASIC PROPERTIES | Dimensional stability, max., percent | % | 0.1 |
| | Solder resistance | 10 sec at 288 °C | Pass |
| | Peel strength (as received) | Kg/cm | 1.8 |
| | Temperature survivability | F | 390° high and -65° Low |
| | Fatigue | % strain | < 0.2 |
| ELECTRICAL PROPERTIES | Capacitance | pF | 1750 |
| | Maximum input | | 50 ~70 VAC, VDC ~2x |
| | Volume resistivity | megohm-cm (ambient) | 10 ⁹ |
| | Surface resistivity | megohm-cm (ambient) | 10 ⁸ |
| | Insulation resistance | megohm | 10 ⁵ |



References: SMART Layer Encyclopedia (includes tests conducted for Salt Fog, temperature, humidity etc, and other Mil-Std tests)

Acellent SMART Layer® sensors have the following characteristic features:

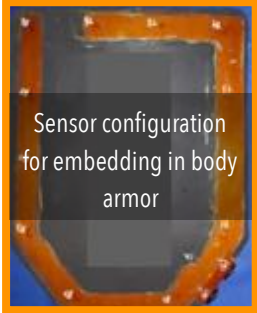
- Thin, dielectric film with embedded pre network of sensors/ actuators
- Precise sensor positioning with consistently repeatable signals
- Mil-standard connector option for robust connection to hardware
- Incorporation of multiple types of sensors (Piezoelectric, Strain gages, fiber-optic etc.)
- Durable and reliable under variable and harsh environments
- Embedded in composite structures or surface mounted on existing metal and composite structures
- Flexible and adaptable to any structure and geometry
- Multiple-path wiring option to enhanced survivability
- Flight-tested, Mechanical and Electric Fatigue Tested
- Adapts to virtual any structural geometry
- Shielding option to reduce EM noise
- Excellent electrical insulation properties



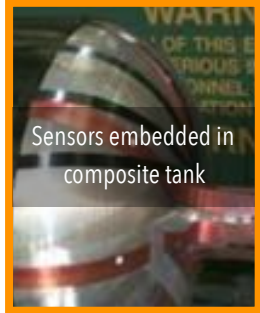
Sensors for configuration for aircraft bay



Multi-layer cascading sensor network for single lap and double lap joints



Sensor configuration for embedding in body armor



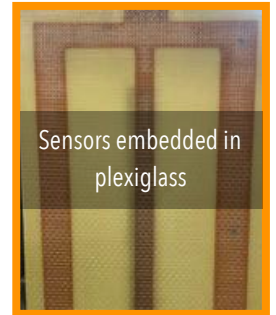
Sensors embedded in composite tank



Sensors for bolt-loosening and impact detection



Sensors for corrosion/erosion monitoring in pipelines



Sensors embedded in plexiglass

CUSTOM SMART LAYER®

Custom SMART Layer® sensor networks provide the utmost flexibility in design, allowing them to conform to challenging geometries with precise sensor placement for consistent reliable damage detection results.

INSTALLATION

KIT



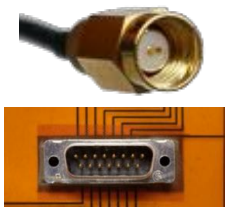
Sensors can be individually surface-mounted with permanent epoxy adhesive or permanent mounting tape, followed by pressure and heat to cure and seal the epoxy, and coated to meet environmental requirements. The installation kit depicted can be obtained from us to ease your installation process.

SERVICE

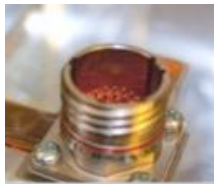


Acellent provides custom on-site or off-site installation services depending on the need of the install.

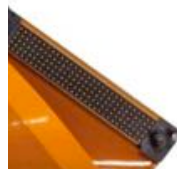
CONNECTOR TYPES



Standard



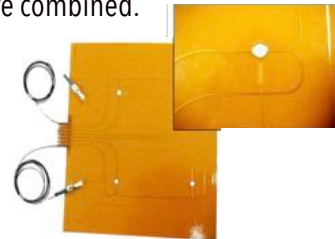
MIL-Grade

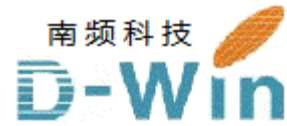


Custom

MULTI-MODAL SENSING

Custom Hybrid SMART Layer® sensor networks can include any number of sensor types. In this case, PTZ and Fiber Brag Grating optical sensors are combined.





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