



Applications

Long-term Monitoring, Risk and Damage Assessment of:

- ♦ **Civil Structures/Civionics** (bridges, dams, tunnels, buildings)
- ♦ **Energy** (wind turbines, pipelines, nuclear reactors)
- ♦ **Aerospace Vehicles** (composite structures, wind tunnels, dynamic tests)
- ♦ **Oil & Gas** (platform structural health monitoring)
- ♦ **Marine Vessels** (hull, mast, rudder, submarine pressure tests)
- ♦ **Transportation** (railways, roadways)



Description

The **os300-100 Surface-Mount Strain Gage Patch with Temperature Compensation** is designed to provide an optical alternative to a conventional foil strain gage (see advantages). Installation is easy as the **os300-100** is mounted using conventional techniques and is designed for use as a single sensor or in series. The **os300** line of sensors offers great flexibility and can be configured in "tension only", "compression only", or "tension and compression" designs. Temperature compensation in the **os300-100** is accomplished in application software when the sensor is bonded to a similar CTE material as the sensor substrate. All **Micron Optics** sensors have excellent compatibility with **Micron Optics** sensing instruments and maximize performance.

Advantages of FBG Sensors

- ♦ **Multi-Sensor Arrays** - easily facilitates many sensors on a single fiber
- ♦ **Remote Sensing** - long distances between sensors or between sensors and instrument
- ♦ **Small Physical Size** - can be embedded directly into concrete or composite structures
- ♦ **Simple, Low Cost Installation** - due to multi-sensor array feature
- ♦ **Passive Sensor** - eliminates ESD and spark hazard, and immune to electromagnetic interference
- ♦ **Insensitive to Corrosion**
- ♦ **Hard to Detect** - small in size, made of glass fiber, uses lightwaves not visible to the naked eye, no electromagnetic field generation by the sensor
- ♦ **Variety of Sensors Available** - strain, temperature, displacement, pressure, etc...

Specifications

Optical

Fiber Type	SMF-28, Polyimide
FWHM Bandwidth	0.25 nm
Side Mode Suppression	15 dB
FBG Wavelength Range	See Table Below

Mechanical

Gage Type	Surface Mount Patch (Temperature Compensated)
Temperature Compensation	Coefficient of Thermal Expansion (CTE) 12.2um/m-°C
Connector Type	FC/APC
Gage Factor	1.21pm/microstrain +/- 1.0% at 21°C
Operating Temperature Range	-20° to 80°C
Strain Limits ¹	+/- 1500 microstrain Tension & Compression
Dimensions	135 mm x 13 mm x 2 mm
Pigtail Length	>80 cm
Weight	5.5 g
Recommended Adhesive	100%-Solids Epoxy Such As M-Bond AE10

¹ Also available in the following configurations: +3000 microstrain Tension Only; -3000 microstrain Compression Only

Strain Measurement Using Temperature-Compensated Gages:

Fiber Bragg grating-based sensors respond to temperature-induced strain as well as mechanically-induced strains. The temperature-induced strain is a combination of two factors. First, the relative difference in coefficients of thermal expansion (CTE) between the gage and the substrate on which it is mounted produces strain in response to changes in temperature. Second, the index of refraction of a Bragg grating is a function of temperature causing the center wavelength to shift with temperature changes. Temperature-compensated gages comprised of two gratings (one active strain grating, and one temperature-compensating grating) are used to factor out temperature-induced strain.

Sensor I.D.	Wavelength Range
A	1510nm to 1518nm
B	1518nm to 1526nm
C	1526nm to 1534nm
D	1534nm to 1542nm
E	1542nm to 1550nm
F	1550nm to 1558nm
G	1558nm to 1566nm
H	1566nm to 1574nm
I	1574nm to 1582nm
J	1582nm to 1590nm

