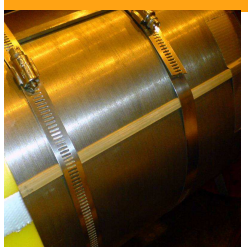
12.1061 MUST FBG MULTIPLEX SMARTPROFILE DEFORMATION SENSOR



GENERAL DESCRIPTION

The SMARTprofile strain sensors are transducers that transform a strain variation into a change in reflected wavelength of a FBG encapsulated into a surface mountable patch. These sensors are compatible with SMARTEC MuST reading units.

TECHNICAL DESCRIPTION

The SMARTprofile consists of a reinforced composite profile inside which an embedded strain-sensing FBG is installed. An additional temperature sensor can optionally be embedded in the same profile at the end of the sensor.

Small cross-section (width ~8 mm; thickness ~3 mm) and composite packaging properties make it ideal for its application in harsh on-site conditions. It features high mechanical, chemical and temperature resistance.

It can be effectively used in the following applications:

- Structural monitoring of naval structures
- Sub-sea applications; e.g. monitoring of shallow and deep-water risers, off-shore platforms, and other oil & gas structures
- Industrial and military structures etc.

The SMARTprofile can be simply bonded or clamped to any kind of surface such as steel, composite, concrete, etc.

FEATURES

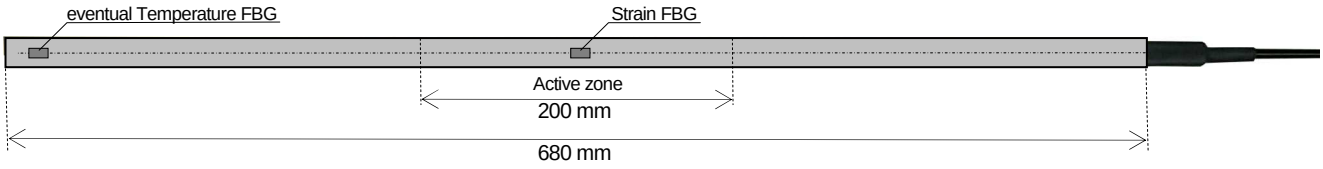
- High resolution
- Insensitive to temperature variations
- Insensitive to corrosion, vibrations and EM fields
- No calibration required
- Ideal for harsh on-site conditions
- Suitable for extreme pressure conditions
- Extended temperature range
- High chemical resistance
- Applicable in deep water
- Long lifetime

The SMARTprofile sensor is composed of an active and a passive zone. The active zone contains the composite sensing profile with embedded one or two Fiber Bragg Gratings (the second for temperature measurement and compensation). The metallic tube containing the optional temperature sensing FBG is also embedded in the same profile. The active zone serves as a measurement basis of the sensor. The passive zone is composed of the interconnection cable and a connector.

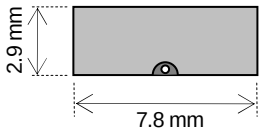
Up to 4 such sensors can be chained to form a single sensing array. The temperature sensor can only be installed in the terminal sensor of the chain. Standard E-2000 connectors with a built in protective cover are used to connect the sensor with the reading unit or extension cables.

SENSOR DRAWINGS

Side view



Cross section



TECHNICAL CHARACTERISTICS

Sensing profile dimensions	Width = 7.8 mm Thickness = 2.9 mm Length = 680 mm
Connection cable dimensions	In flexible stainless steel reinforced cable with external plastic sheath Ø 3 mm
Conditions of use	Exposed to extreme hydrostatic pressure, seawater and some chemicals as well as high and low temperatures
Number of measurement FBGs	1
Number of Temperature FBGs	0 or 1 (only in the last sensor of an array)
Max. number of sensors on same chain	4
Measurement range	0.5 % in shortening, 1.0 % in elongation
Resolution / Accuracy	Strain sensor : 2 με (0.002 mm/m) / <0.2% Temperature sensor : 0.2 ℃ / 1℃
Operating temperature	Sensing profile : -55 ℃ to +200 ℃ Connector : -40 ℃ to +80 ℃
Operating hydrostatic pressure	Sensing profile : 0 to 30 MPa (0 to 300 bar)
Temperature compensation	Using optional temperature sensing FBG
Calibration	Individual calibration is not required

ORDERING INFORMATION

12.1061 MuST FBG Multiplex SMARTProfile Deformation Sensor double-ended
12.1062 MuST FBG Multiplex SMARTProfile Deformation Sensor single-ended

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