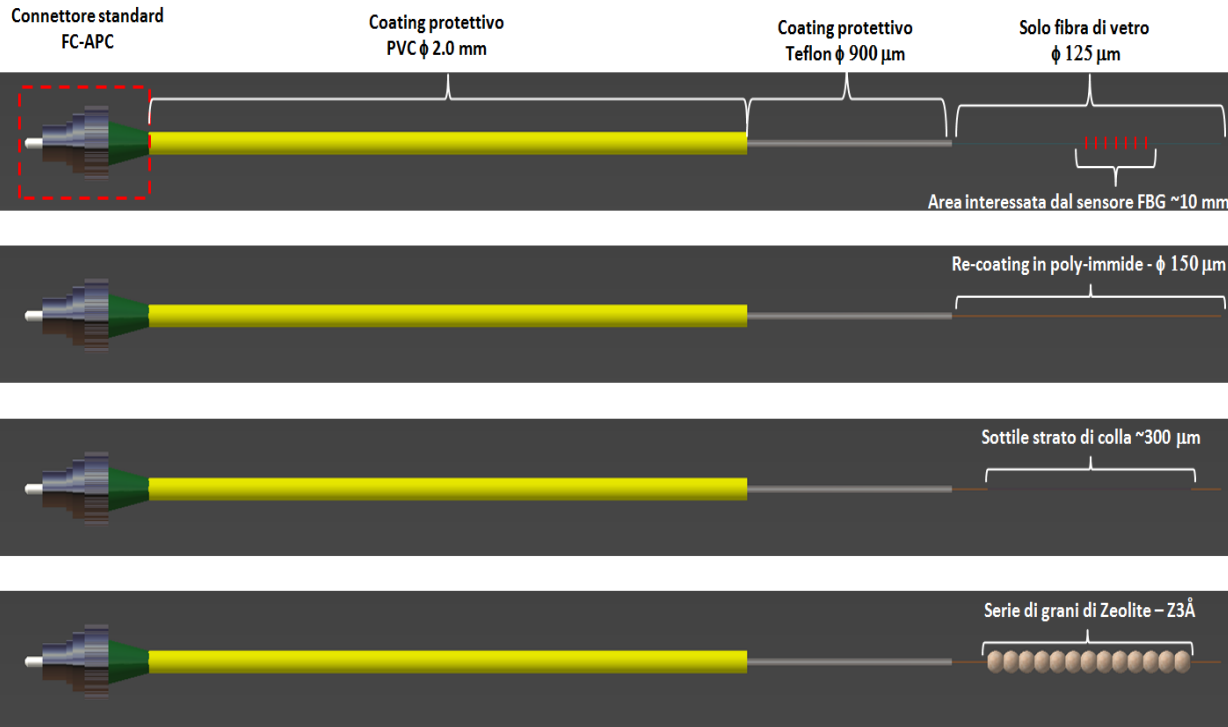


# FBG SENSOR FOR ENVIRONMENTAL MEASUREMENTS



**PRIORITY NUMBER:**

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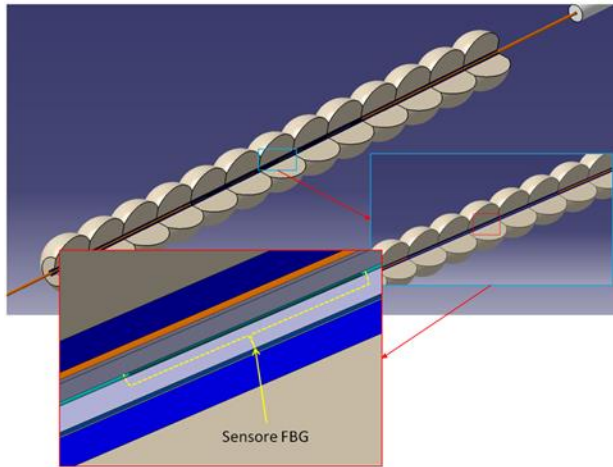
**KEYWORDS:**

Sensors  
Environment  
Optical Fiber  
Fiber Bragg Gratings  
Zeolite

Fiber-optic sensors with FBG (Fiber Bragg Gratings) technology can be used to monitor environmental parameters and measure some material properties. By exploiting the porous structure of zeolite-type materials, it is possible to correlate, with nanometric or picometric precision, the volumetric transformations of the material to the mechanical deformations applied to the FBG sensor.

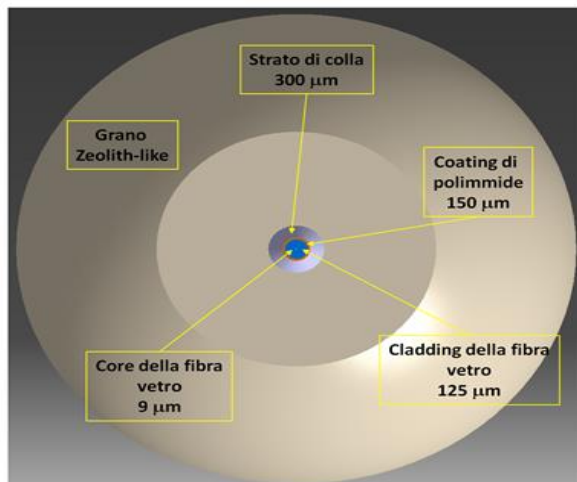


# FBG SENSOR FOR ENVIRONMENTAL MEASUREMENTS



## DESCRIPTION :

The technology enables the use of fiber optic sensors, especially of the FBG type, as monitors of physical, chemical and environmental parameters. Standard FBG sensors are strain gauges made of chemically and physically neutral materials, only able to detect the deformations induced by a signal propagating along the optical fiber. By surrounding the FBG device with microporous materials, such as zeolites, the sensors will register the strains on materials (as usual) but these will be linked to the status of materials themselves and to the environmental conditions in which the sensors are dipped. Moreover, using a single optical fiber with multiplexed sensors, it is possible to simultaneously measure several parameters such as temperature and humidity, and to evaluate the presence of some absorbed elements.



## ADVANTAGES:

- One acquisition system with real time independent measurements of several parameters
- High system design flexibility
- Higher resolution and performances than existing FBG standard technologies

## APPLICATIONS:

- Pollutant monitor
- Humidity and temperature control
- Characterization of zeolite type materials
- Characterization of absorbed materials