

# OS4300

## Non-metallic Temperature Sensor

### APPLICATIONS

- Continuous lifetime health monitoring of bridges, dams, buildings, tunnels, ships, aircraft, trains, and other complex structures.
- Core building block for fiber optic transducers for strain, temperature, displacement, pressure, and acceleration.
- Measurement of absolute temperature on a structure's surface.
- Measurement of relative temperature for compensation of strain measurements.



### FEATURES

- Fast response time.
- Qualified to same rigorous standards used for comparable electronic gages.
- Cable integrated with sensor package for fiber protection and strain relief.
- Non metallic construction.
- Fast, simple, repeatable installation.
- Connector protection fittings available for harsh environment.
- Armored fiber cable and rugged sensor package.
- Several package options for field and laboratory applications.
- Calibrated for high absolute accuracy.
- Double ended design supports multiplexing of many sensors on one fiber.
- Applied Geomechanics' patented micro opto-mechanical technology.

### DESCRIPTION

The os4300 Non-metallic Temperature Sensor is a family of gages designed to make fiber handling easy and sensor installation fast and repeatable. It is based on fiber Bragg grating (FBG) technology. The os4300's body is a sealed,

alumina ceramic tube that protects the FBG. Since there are no epoxies holding the fiber to the tube, long term stability is ensured by design.

Three packaging options provide for installation that mimics that of conventional thermocouples with armored cables and protected connectors, and small sensors that provide the user with both installation flexibility and sub second response.

In side by side comparisons with conventional thermocouples, the os4300 is equally accurate, while providing for much faster response, wider operating range, no calibration, and less noise. The os4300 temperature sensor is qualified for use in harsh environments and delivers the many

advantages inherent to all FBG based sensors.

This sensor can be used alone or in series as a part of an FBG sensor array. Installation and cabling for such arrays is much less expensive and cumbersome than comparable electronic gage networks.

With each sensor, Applied Geomechanics provides a Sensor Information Sheet listing the gage factor and calibration coefficients needed to convert wavelength information into engineering units. Applied Geomechanics' ENLIGHT Sensing Software provides a utility to calculate and then record, display, and transmit data for large networks of sensors.



SPECIFICATIONS <sup>1</sup>	os4310 NON-METALLIC	os4330 NON-METALLIC EPOXY MOUNT	os4350 ARMORED CABLE, FLANGE MOUNT
<b>THERMAL PROPERTIES</b>			
<b>OPERATING TEMPERATURE RANGE</b>	-40 to 120°C		
<b>TEMPERATURE SENSITIVITY</b>	~10pm/°C (±1.7pm/°C)		
<b>CABLE TEMPERATURE RANGE</b>	-40 to 250°C (FC/APC Connectors: -40 to 80°C)		
<b>RESPONSE TIME<sup>2</sup></b>	0.7 seconds	4.6 seconds	4.2 seconds
<b>STANDARD CALIBRATION<sup>3</sup> (INCLUDED)</b>	Long Term Accuracy <sup>4</sup> Short-Term Accuracy <sup>5</sup>	1.0°C 0.6°C, Typical	
<b>PREMIUM CALIBRATION<sup>3</sup> (OPTIONAL)</b>	Long Term Accuracy <sup>4</sup> Short Term Accuracy <sup>5</sup>	0.5°C 0.2°C, Typical	
<b>PHYSICAL PROPERTIES</b>			
<b>DIMENSIONS (L X W X H)<sup>6</sup></b>	18.8 x 3.2 Dia mm	31.8 x 7.6 x 7.6 mm	31.5 x 15.0 x 7.6 mm
<b>WEIGHT (INCLUDING CABLE)</b>	2.6 g	4.3 g	38 g
<b>HOUSING MATERIAL</b>	Alumina	Alumina	Anodized Aluminum
<b>CABLE LENGTH</b>	1 m (± 10 cm)		
<b>FIBER TYPE</b>	SMF28-Compatible		
<b>CABLE BEND RADIUS</b>	≥ 17 mm		
<b>CABLE TYPE</b>	0.9 mm Fiberglass Braid	0.9 mm Fiberglass Braid	3mm Armored Cable
<b>FC/APC CONNECTORS</b>	Optional	Optional	Both connector and protection fittings optional
<b>FASTENING METHODS<sup>6</sup></b>	Bond Strain Reliefs only	Epoxy type	#6 Self Drilling Screws or Epoxy
<b>OPTICAL PROPERTIES</b>			
<b>PEAK REFLECTIVITY (Rmax)</b>	> 70%		
<b>FWHM (-3 dB POINT)</b>	0.25 nm (± .05 nm)		
<b>ISOLATION</b>	> 15 dB (@ ± 0.4 nm around center wavelength)		

Notes:

1. Denotes Beta product. For more details see [www.micronoptics.com/product\\_designation.php](http://www.micronoptics.com/product_designation.php).
2. Time to reach 63% of total temperature drop in water (100°C).
3. Absolute accuracy of sensor is dependent on capability of interrogation instrument.
4. Based on 120°C soak for 1,000 hours.
5. Four (4) thermal cycles from min to max temperature. Max. accuracy error ±0.4°C without data averaging.
6. See [http://www.micronoptics.com/support\\_downloads/Sensors/](http://www.micronoptics.com/support_downloads/Sensors/) for sensor drawings and installation details.

**ORDER CODES:**

**USEFUL ACCESSORIES:**

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