MICRON OPTICS Sensor Information Sheet

os3150 | Optical Strain Gage

Part # os3150- w-1xx-1yy

Serial #

Nominal Wavelength, λ_0 (nm) @22°C 0000.0

Certified by: _____

Variable	Description	Value	Units
F_G	Gage Factor	00.000 @ 22°C	-
C_1	Gage Constant 1	6.156 @ 22°C	µm/m-°C
C_2	Gage Constant 2	0.70	µm/m-°C
ΔT	Temperature Change	Measured	°C
CTE_S	CTE of Test Specimen	User Defined	µm/m-°C
$\Delta\lambda$	Wavelength Shift	Interrogated	nm
λ_0	Nominal Wavelength	Initial Value	nm

Strain (mechanically induced µm/m):

$$\varepsilon = (\Delta\lambda/\lambda_0)\, 1x10^6 / F_G - \varepsilon_{TO}$$

Thermal Output (thermally induced apparent strain, µm/m):

$$\varepsilon_{TO} = \Delta T\, [C_1 / F_G + CTE_S - C_2]$$

Thermal Output and Temperature Compensation

Fiber Bragg grating (FBG) based strain gages respond to both strain and temperature. Temperature induced strain results from a combination of two factors.

1) Thermal expansion of the substrate on which the gage is mounted.
2) Thermally induced index of refraction changes in the FBG.

Both factors affect the FBG's center wavelength.

Several methods are available to decouple strain and temperature components in measurements using this gage. Popular methods involve using FBGs to measure change in temperature or employing dummy FBG strain gages (as with conventional electronic strain gages).

For additional information about temperature compensation techniques and converting wavelength values to strain and temperature, see*:*

http://www.micronoptics.com/support_downloads/Sensors/

Micron Optics Quality and Performance

TUNED

Products displaying the "Micron Optics Tuned" logo include Micron Optics tunable technologies thus ensuring high quality and performance. Certified sensors have been tested and qualified for use with Micron Optics Sensing Instruments.

Qualification Statement

This sensor has been manufactured using procedures and materials documented under Micron Optics, Inc's ISO 9001:2008 quality management system.

Patent Certification


MICRON OPTICS, INC.
INTERNATIONAL CERTIFICATION FOR FIBER OPTIC SENSING

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Installation Information

The os3150 Strain Gage is designed to be spot welded to steel using a capacitive-discharge spot welder having 50-100 watt-seconds of energy. The spot welder should be equipped with a spherical tip electrode with a diameter of approximately 0.03 inches (0.76 mm). Practice welds using a blank os3150 gage may be helpful in developing proper technique.

Use firm pressure on the electrode. After making a practice weld, pull the gage off of the surface. A properly formed weld will result in a small piece of the specimen or gage surface to break away. If needed, adjust the weld energy and electrode pressure until a satisfactory weld is obtained.

Detailed installation instructions and welder recommendations are available at:

http://www.micronoptics.com/support_downloads/Sensors/

This Sensor Information Sheet is verification of conformance.