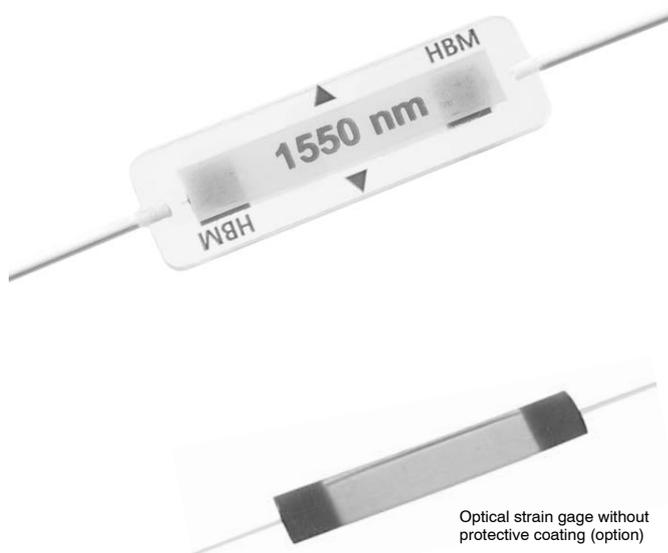


# OL

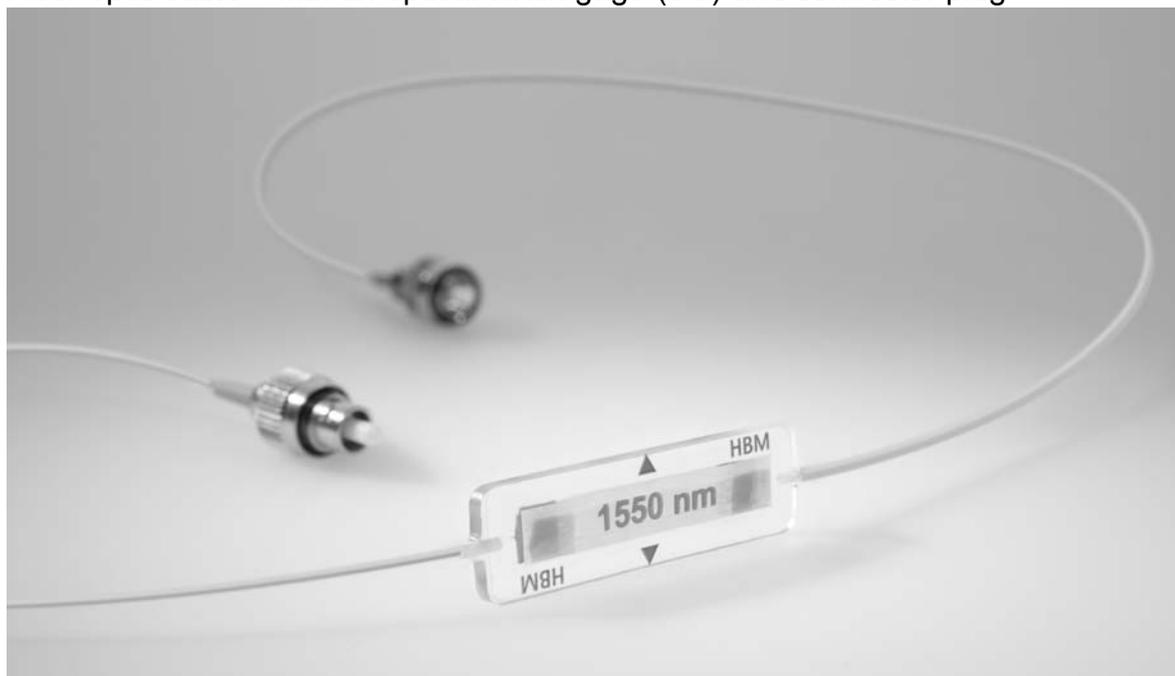
## Optical Strain Gage (SG)



### Special features

- Optical SG – based on fiber Bragg grating
- Up to 13 optical strain gages per glass fiber
- Installation similar to electrical SG
- All relevant data has been determined and specified, e.g. gage factor
- Insensitive to electromagnetic interference
- For use in potentially explosive atmospheres
- Reduced wiring effort compared to electrical SG
- Light weight of glass fiber compared to conventional connecting leads

Fiber optic cable<sup>1)</sup> with an optical strain gage (SG) and connector plug<sup>1)</sup>



<sup>1)</sup> Spliced fiber optic cable with connector and buffer is available as an option.

# Specifications

<b>Design</b>		Glass fiber with Bragg grating, symmetrically embedded in modified acrylic resin	
<b>Outside diameter of the glass fiber</b>	μm	185	
<b>Core diameter of the glass fiber</b>	μm	5	
<b>Diameter with buffer</b>	mm	1.5	
<b>Dimensions</b>		Strain gage (Standard)	Strain gage without protective coating (on customer request)
<b>Length</b>	mm	40 ± 1	30 ± 1
<b>Width</b>	mm	12 ± 0.5	5 ± 1
<b>Thickness</b>	mm	2.0 ± 0.5	0.5 ± 0.01
<b>Connector (plug)<sup>1)</sup></b>		FC/ACP	
<b>Available Bragg wavelengths</b>	nm	1520, 1525, 1530, 1535, 1540, 1545, 1550, 1555, 1560, 1565, 1570, 1575, 1580	
<b>Bragg wavelength tolerance</b>	nm	± 1	
<b>Gage factor</b>		approx. 0.78, specified on each package	
<b>Gage factor tolerance</b>	%	2	
<b>Reference temperature</b>	°C [°F]	23 [73.4]	
<b>Operating temperature range</b>	°C [°F]	-10 ... +80 [14 ... +176]	
<b>Storage temperature range</b>	°C [°F]	-20 ... +100 [-4 ... +212]	
<b>Temperature response</b> (coefficient of thermal expansion of the test object to be added) Temperature response as function of wavelength $\Delta\lambda/\lambda$ per K	μm/m/K	7.0	
	ppm/K	5.5	
<b>Tolerance of the temperature response</b>	μm/m/K	1	
<b>Max. elongation at reference temperature using Z70 adhesive</b>			
<b>absolute strain value for positive direction</b>	μm/m	10,000 (1 %)	
<b>absolute strain value for negative direction</b>	μm/m	10,000 (1 %)	
<b>Fatigue life, at reference temperature using Z70 adhesive</b>			
<b>Number of load cycles <math>L_W</math> at</b>			
alternating strain $\epsilon_w = \pm 1000 \mu\text{m/m}$ and variation of zero point $\Delta\epsilon_m \leq 30 \mu\text{m/m}$		>>10 <sup>7</sup> (stopped after 10 <sup>7</sup> load cycles)	
alternating strain $\epsilon_w = \pm 3000 \mu\text{m/m}$ and variation of zero point $\Delta\epsilon_m \leq 60 \mu\text{m/m}$		>>10 <sup>7</sup> (stopped after 10 <sup>7</sup> load cycles)	
<b>Fatigue life, at reference temperature using X280 adhesive</b>			
<b>Number of load cycles <math>L_W</math> at</b>			
alternating strain $\epsilon_w = \pm 5000 \mu\text{m/m}$ and variation of zero point $\Delta\epsilon_m \leq 100 \mu\text{m/m}$		>>10 <sup>7</sup> (stopped after 10 <sup>7</sup> load cycles)	
<b>Minimum radius of curvature (longitudinal and transverse) at reference temperature</b>	mm	25	
<b>Bonding material that can be used</b> cold curing adhesives		Z70, X60, X280	

1) Spliced fiber optic cable with connector and buffer is available as an option (length as specified by customer).

2) Contact pressure when using X280 with optical strain gages: 1 N/cm<sup>2</sup>.

The achievable number of load cycles is dependent on the quality of the installation and the endurance strength of the component under investigation.

Modifications reserved.

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