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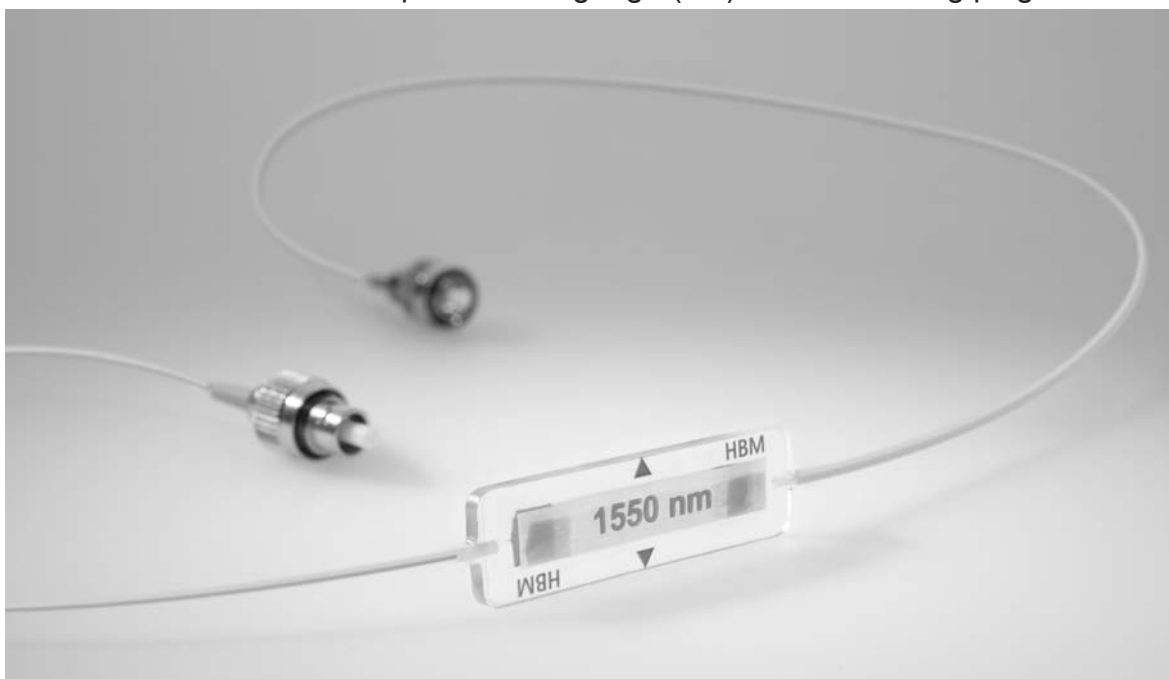
## Optical strain gauges (SG)

### Characteristic features



- Optical strain gauges – Based on fiber Bragg grating
- Up to 13 optical strain gauges per glass fiber
- Installation like electrical strain gauges
- All relevant data determined and provided, e.g. gauge factor
- Insensitive to electromagnetic interferences
- Application in Ex-areas possible
- Lower wiring outlay compared to electrical strain gauges
- Lower mass of glass fiber compared to standard connecting cables

Glass fiber cable<sup>1)</sup> with an optical strain gauge (SG) and connecting plug<sup>1)</sup>



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

## Specifications

<b>Design</b>		OptiMet-OMF-Fiberglass symmetrically embedded in modified acrylic resin, with a Bragg grating; potted in plastic material
<b>Core diameter of glass fiber, approx.</b>	μm	6
<b>Diameter of fiber cladding, approx.</b>	μm	125
<b>Outer diameter of coating, approx.</b>	μm	195
<b>Diameter with jacket, approx.</b>	mm	1.5
<b>Dimensions</b>		
<b>Length</b>	mm	40 ± 1
<b>Width</b>	mm	12 ± 0.5
<b>Thickness</b>	mm	2.0 ± 0.5
<b>Connector (plug) <sup>1)</sup></b>		FC/APC
<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>Gauge factor, approx.</b>		0.78 (stated on the packaging)
<b>Gauge factor tolerance</b>	%	± 2
<b>Maximum degree of reflection</b>	%	15
<b>Transverse sensitivity <sup>2)</sup></b>	%	0
<b>Reference temperature</b>	°C	23
<b>Operating temperature range</b>	°C	-10 ... +80
<b>Storage temperature range</b>	°C	-20 ... +100
<b>Temperature response</b> (thermal expansion coefficient of measurement object 0 μm/m/K) Temperature response as function of wavelength variation $\Delta\lambda/\lambda_0$ per K	μm/m/K ppm/K	7.0 5.5
<b>Tolerance of temperature response</b>	μm/m/K	± 1
<b>Maximum elongation</b> at reference temperature when using <b>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</b> at reference temperature when using <b>Z70 adhesive</b>		
<b>Achieved no. of load cycles <math>L_w</math> at</b> Alternating strain $\epsilon_w = \pm 1000 \mu\text{m/m}$ and variation of zero point $\epsilon_m\Delta \leq 30 \mu\text{m/m}$		>>10 <sup>7</sup> (aborted after 10 <sup>7</sup> load cycles)
Alternating strain $\epsilon_w = \pm 3000 \mu\text{m/m}$ and variation of zero point $\epsilon_m\Delta \leq 60 \mu\text{m/m}$		>>10 <sup>7</sup> (aborted after 10 <sup>7</sup> load cycles)
<b>Fatigue life</b> at reference temperature when using <b>X280 adhesive <sup>3)</sup></b>		
<b>Achieved no. of load cycles <math>L_w</math> at</b> Alternating strain $\epsilon_w = \pm 5000 \mu\text{m/m}$ and variation of zero point $\epsilon_m\Delta \leq 100 \mu\text{m/m}$		>>10 <sup>7</sup> (aborted after 10 <sup>7</sup> load cycles)
<b>Minimum radius of curvature longitudinal and transverse</b> at reference temperature	mm	25
<b>Applicable bonding materials</b> Cold curing adhesives		Z70, X60, X280

<sup>1)</sup> Spliced fiber optic cable with plug and protective cover is available as an option (length as requested by customer).

<sup>2)</sup> As per VDI/VDE/GESA 2635. A tolerance cannot be given as the transverse sensitivity is 0.

<sup>3)</sup> Contact pressure when using X280 with optical strain gauge: 1 N/cm<sup>2</sup>  
Achievable number of load cycles dependent on quality of installation and fatigue life of component under investigation.

Subject to modifications.

All product descriptions are for general information only.  
They are not to be understood as a guarantee of quality or durability.

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