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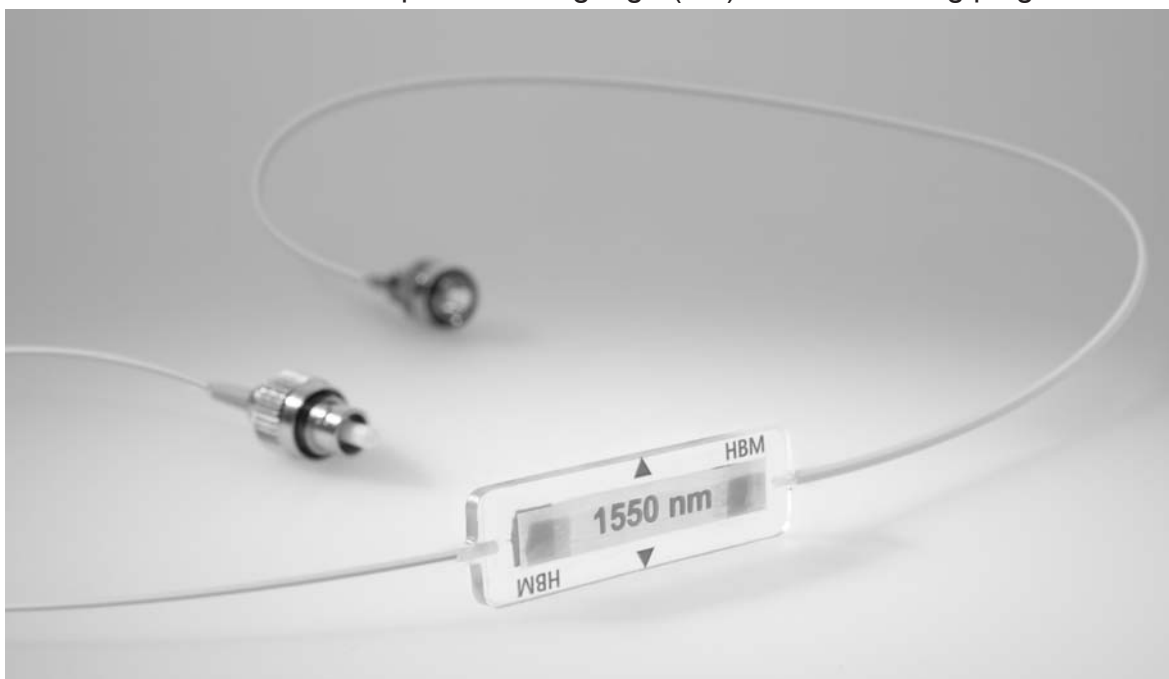
Optical strain gauges (SG)

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 cable¹⁾ with an optical strain gauge (SG) and connecting plug¹⁾



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

Specifications

Design		OptiMet-OMF-Fiberglass symmetrically embedded in modified acrylic resin, with a Bragg grating; potted in plastic material
Core diameter of glass fiber, approx.	µm	6
Diameter of fiber cladding, approx.	µm	125
Outer diameter of coating, approx.	µm	195
Diameter with jacket, approx.	mm	1.5
Dimensions		
Length	mm	40 ± 1
Width	mm	12 ± 0.5
Thickness	mm	2.0 ± 0.5
Connector (plug) ¹⁾		FC/APC
Available Bragg wavelengths	nm	1520, 1525, 1530, 1535, 1540, 1545, 1550, 1555, 1560, 1565, 1570, 1575, 1580
Bragg wavelength tolerance	nm	± 1
Gauge factor, approx.		0.78 (stated on the packaging)
Gauge factor tolerance	%	± 2
Maximum degree of reflection	%	15
Transverse sensitivity ²⁾	%	0
Reference temperature	°C	23
Operating temperature range	°C	-10 ... +80
Storage temperature range	°C	-20 ... +100
Temperature response (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
Tolerance of temperature response	µm/m/K	± 1
Maximum elongation at reference temperature when using Z70 adhesive		
Absolute strain value for positive direction	µm/m	10.000 (1%)
Absolute strain value for negative direction	µm/m	10.000 (1%)
Fatigue life at reference temperature when using Z70 adhesive		
Achieved no. of load cycles L_w at Alternating strain $\epsilon_w = \pm 1000$ µm/m and variation of zero point $\epsilon_m\Delta \leq 30$ µm/m		>>10 ⁷ (aborted after 10 ⁷ load cycles)
Alternating strain $\epsilon_w = \pm 3000$ µm/m and variation of zero point $\epsilon_m\Delta \leq 60$ µm/m		>>10 ⁷ (aborted after 10 ⁷ load cycles)
Fatigue life at reference temperature when using X280 adhesive ³⁾		
Achieved no. of load cycles L_w at Alternating strain $\epsilon_w = \pm 5000$ µm/m and variation of zero point $\epsilon_m\Delta \leq 100$ µm/m		>>10 ⁷ (aborted after 10 ⁷ load cycles)
Minimum radius of curvature longitudinal and transverse at reference temperature	mm	25
Applicable bonding materials Cold curing adhesives		Z70, X60, X280

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

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

³⁾ Contact pressure when using X280 with optical strain gauge: 1 N/cm²
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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