



FIBER OPTICS

LIST OF CALIBRATION COEFFICIENTS - EXAMPLE

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EQUATIONS

STRAIN EQUATION

$$\Delta\varepsilon = \frac{\lambda_{act, strain} - \lambda_{0, inst, strain} - B \cdot (T_{act} - T_{0, inst})}{A \cdot \lambda_{0, inst, strain}}$$

Measurand	Description
$\Delta\varepsilon$ [$\mu\varepsilon$]	Strain shift
$\lambda_{0, inst, strain}$ [nm] **1	Initial strain wavelength
$T_{0, inst}$ [$^{\circ}\text{C}$] **1	Initial temperature
T_{act} [$^{\circ}\text{C}$] **2	Actual temperature
$\lambda_{act, strain}$ [nm] **2	Actual strain wavelength

STRING EXPRESSION

$((\lambda_{act, strain} - \lambda_{0, inst, strain}) / (\lambda_{0, inst, strain} - B \cdot (T_{act} - T_{0, inst}))) / A$

For the determination of the strain sensitivity the free fiber length was used as a basis

**1 To be measured after installation of the sensor

**2 Measured value during monitoring of the sensor

CALIBRATION COEFFICIENTS

Nr.	Serial number	FBG	Product	A [$\mu\varepsilon^{-1}$]	B [$^{\circ}\text{C}^{-1}$]
1	198126/0001		FFA-01; 1x FBG, WL: 1535nm; LCP-01: 1x2,4m, 1x0,1m, 1x FC/APC	7,758423E-07	5,892923E-06