

Birefringent Material-Based Stress Sensor

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Abstract. This paper deals with the initial design and realization of a laboratory sample of a birefringent material-based stress sensor. A cube-like sample of commercial polycarbonate (PC) with a volume of approx. 1cm^3 is used as an active medium providing information on the applied stress. The sensor uses the stress-induced birefringence of the PC sample for measuring the applied stress. The proposed sensor is calibrated by a commercial weighing element. The utilization of the element allows the conversion of the unknown applied load into a known mechanical stress value according to the known size of the sensing area. In the paper, we report the result of the calibration routine of the sensor sample and discuss the possible application areas.