

Photoelastic Birefringence of Polycarbonate as a Basis for Optical Sensors of Load

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Abstract. In the paper we present the results of an experimental investigation of birefringence of polycarbonate specimens that are subject to compressive stress. A plane polariscope setup is used for investigation and the so called residual birefringence of unloaded samples is determined in VIS, first. After that a load within the range of elastic deformation is gradually applied to the specimen under investigation and the spectra of light transmitted through the polarizer – compressed sample – analyzer are recorded and the loading head displacement is measured. Normalized intensity of light as function of strain is obtained and analyzed in order to get the photoelastic birefringence as function of strain. The obtained results are discussed in terms of suitability of polycarbonate material for constructing optical sensors of load.