



MATERIAL CHARACTERIZATION OF POLYCARBONATE UNDER GLASS TRANSITION TEMPERATURE

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The aim of this study is was to identify the material characteristics of Polycarbonate (PC) under glass transition temperature. For this purpose, a series of uniaxial thermotensile tests and regression analysis were adopted for this study. The thermotensile experiments were conducted under a wide range of glass transition temperatures and elongation rates, to demonstrate the temperature and strain rate effects of PC. Based on experimental results, we confirmed the ideal manufacturing parameters for the process of thermoforming PC. Following the experiments, the reliability of general hyperelastic models was examined and compared through regression analysis. The results of this analysis indicated that only a limited number of hyperelastic models accurately describe the mechanical behavior of PC at its glass transition temperature. By combining the results of the experiment and analysis, a more comprehensive and accurate description of the material behavior of PC at glass transition temperatures was proposed. Criteria for evaluating material characterization was also suggested. The results of this study could be applied to improving PC thermoforming techniques.