

Ultrasonic Measurement of Elastic Properties of Fiber Reinforced Composite Materials

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Abstract : In this study, elastic constants, Young's modulus, Poisson's ratios, and shear moduli of orthotropic composite materials, consisting of E-glass/epoxy and carbon/epoxy, were calculated by ultrasonic velocities which were measured using ultrasonic pulse-echo method. 35 MHz computer controlled analyzer, 60 MHz digital oscilloscope, 5 MHz longitudinal probe, and 2,25 MHz transverse probe were used for the measurements of ultrasound velocities, the measurements were performed at ambient temperature. It was understood from the data obtained in this study that, measured ultrasound velocities and the calculated elasticity coefficients were depending on the fiber orientations.

Keywords : composite materials, elastic constants, orthotropic materials, ultrasound

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