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# Resonant-Based Identification of the Poisson's Ratio of Orthotropic Materials

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**Abstract** The resonant-based identification of the in-plane elastic properties of orthotropic materials implies the estimation of four principal elastic parameters: $E_1$, $E_2$, $G_{12}$, and $\nu_{12}$. The two elastic moduli and the shear modulus can easily be derived from the resonant frequencies of the flexural and torsional vibration modes, respectively. The identification of the Poisson's ratio, however, is much more challenging, since most frequencies are not sufficiently sensitive to it. The present work addresses this problem by determining the test specimen specifications that create the optimal conditions for the identification of the Poisson's ratio. Two methods are suggested for the determination of the Poisson's ratio of orthotropic materials: the first employs the resonant frequencies of a plate-shaped specimen, while the second uses the resonant frequencies of a set of beam-shaped specimens. Both methods are experimentally validated using a stainless steel sheet.