



## Implementation of Improved Transverse Shear Calculations and Higher Order Laminate Theory Into Strain Rate Dependent Analyses of Polymer Matrix Compos

By Lin-Fa Zhu

BiblioGov. Paperback. Book Condition: New. This item is printed on demand. Paperback. 32 pages. Dimensions: 9.7in. x 7.4in. x 0.1in. A numerical procedure has been developed to investigate the nonlinear and strain rate dependent deformation response of polymer matrix composite laminated plates under high strain rate impact loadings. A recently developed strength of materials based micromechanics model, incorporating a set of nonlinear, strain rate dependent constitutive equations for the polymer matrix, is extended to account for the transverse shear effects during impact. Four different assumptions of transverse shear deformation are investigated in order to improve the developed strain rate dependent micromechanics model. The validities of these assumptions are investigated using numerical and theoretical approaches. A method to determine through the thickness strain and transverse Poissons ratio of the composite is developed. The revised micromechanics model is then implemented into a higher order laminated plate theory which is modified to include the effects of inelastic strains. Parametric studies are conducted to investigate the mechanical response of composite plates under high strain rate loadings. Results show the transverse shear stresses cannot be neglected in the impact problem. A significant level of strain rate dependency and material nonlinearity is found in the deformation response...



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