

Large Strain Creep Analysis of Composite Thick-Walled Anisotropic Cylinders

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Abstract : Creep analysis of a thick-walled composite anisotropic cylinder under internal pressure and considering large strains is presented. Using a threshold creep law for composite materials, expressions for stresses, strains, and strain rates are derived for several anisotropic cases. Numerical results, presented through several graphs and tables, depict the effect of anisotropy on the stress, strain, and strain rate distributions. Since for a specific type of material anisotropy described in the paper, these quantities are found to have the lowest values at the inner radius (the potential location of cylinder failure), it is concluded that by employing such an anisotropic material for the design of a thick-walled cylinder a longer service life for the cylinder may be achieved.

Keywords : creep, composites, large strains, thick-walled cylinders, anisotropy

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