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Nonlinear delamination analysis of multilayered functionally graded circular shafts in torsion. (English. Russian original) [Zbl 1458.74131](#)

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Summary: Cylindrical delamination in a multilayered functionally graded circular shaft loaded in torsion is analyzed assuming a nonlinear mechanical behaviour of the material by using the Ramberg-Osgood equation. The shaft is made of an arbitrary number of adhesively bonded concentric layers of different thicknesses and material properties. In each layer, the material is functionally graded in both radial and longitudinal directions. A solution for the strain energy release rate is derived by analyzing the energy balance. The solution is used to perform parametric investigations of the delamination behaviour.

MSC:

74R99 Fracture and damage

74E30 Composite and mixture properties

74E05 Inhomogeneity in solid mechanics

Keywords:

Ramberg-Osgood material; analytical solution; energy balance; strain energy release rate

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