عنوان مقاله:

Approximate Torsional Analysis of Multi-layered Tubes with Non-circular Cross-sections

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خلاصه مقاله:

In this paper an approximate formulation for torsional analysis of tubes with multi-layered noncircular cross-sections is presented. A previously presented method based on Bredt's theory is expanded to achieve these formulas. Layers are assumed to be isotropic and may possess different thicknesses and material properties. The obtained formulas for shear stress and angle of twist are applicable to moderately thin to thick cross-sections. The formulation demonstrates relative accuracy and efficacy, especially for cross-sections with thinner walls and rounded corners. It is shown that depending on the properties of the layers, maximum shear stress does not necessarily happen on the outer boundary. Furthermore, the effect of different crosssectional shapes on torsional response is studied. Using the presented method, one can achieve desirable shear stresses and angles of twist for a polygonal multi-layered tube with a proper choice of bluntness.

کلمات کلیدی:

Torsional analysis, multi-layered tubes, non-circular cross-section, imaginarystrips