عنوان مقاله:

Parametric study of nonlinear buckling capacity of short cylinders with Hemispherical heads under hydrostatic pressure

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خلاصه مقاله:

This study investigates the buckling behavior of short cylindrical shells with hemi-spherical heads subjected to hydrostatic pressure. It is assumed that the length of the cylindrical part is smaller than or equal to its diameter while its material may be dif-ferent from that of hemispherical heads. Finite element analysis was used to seek out the effect of geometric parameters such as thickness, length, and volume of the tank on the ultimate buckling load. Results indicate that the buckling load is directly pro-portional with the thickness and inversely proportional with the volume of the vessel. A close examination of the buckling modes reveals that under uniform hydrostatic pressure, the cylindrical part undergoes the most critical deformation compared with its hemispherical heads. This behavior was observed for the two loading cases of (a), a hydrostatic pressure applied to the whole structure and (b), the hydrostatic pressure was only applied to the cylindrical part of the vessel.

کلمات کلیدی:

nonlinear buckling, Shell of revolution, Hydrostatic pressure, Finite Element Analysis

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