عنوان مقاله:

An Experimental Investigation into the Buckling of Stiffened Conical Shellsunder Axial Loading

محل انتشار:

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خلاصه مقاله:

In the present research, effects of adding grid of stiffening ribs to Filament wound conical shells on axial buckling load have been investigated by experimental. The specimen used in the experiment are made from glass/epoxy by winding continuous glass fibers wetted with epoxy on a die with helical and circumferential grooves. These structures have been manufactured adopting a novel manufacturing process that it is a simplified and cheap manufacturing process. Experimental tests were performed using a testing machine at room temperature. The diagrams of axial load versus displacement are recorded in real time during the tests. This test describe failure modes that are present in the structuressuch as rib crippling, skin buckling and general buckling. Axial buckling tests have been carried out and results are compared with finite element analysis. The results shown good agreement between experimental and numerical data. Burn-off tests were performed to obtain the fiber mass content of materials according to ASTM D3171-99 and the material properties used in modeling are determined by rule of mixtures prediction. The experimental observations and comparison with finite element analysis, conclusions are drawn on efficacies of this relatively new class of stiffened structures.

کلمات کلیدی:

Stiffened conical shells; Buckling; Filament winding