

EFFECT OF PATCH LENGTH RATIO OF IN-PLANE LOADING ON THE POST BUCKLING BEHAVIOR OF RECTANGULAR THIN PLATE

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ABSTRACT

The present study investigates the problem of post buckling of thin steel plates subjected to in-plane patch compression loading. Finite difference method was used to treat the stability problems. The geometrically nonlinearity was considered. The present procedure is general and applicable to the buckling, post buckling and free vibration of thin rectangular plates. The influences of initial imperfection, thickness variation, plate aspect ratios, boundary conditions, and length of patch loading on the post buckling behavior are shown graphically. The plate was analyzed with different tapering ratios (t_d/t_o) (1.0, 1.25, 1.5, 1.75 and 2.0) so different patch length ratio (S) (0.0-0.3) were taken. A comparison with previous works is made. Finally, it is shown that the post buckling behavior very sensitive for some effects such as initial imperfection, tapering ratio, and patch length ratio.

KEYWORDS: Thin Plates, Tapered Plates, Large Displacement, Post Buckling Behavior, Patch Compression Loading, Finite Difference Method