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DEPARTMENT OF MECHANICAL ENGINEERING

PROJECT REPORT ON

"BUCKLING ANALYSIS OF COMPOSITE PLATE WITH HOLE"

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ABSTRACT

Compressive buckling analysis was performed on metal-matrix composite (MMC) plates with central square holes and circular holes. The MMC plates have varying aspect ratios and hole sizes and are supported under different boundary conditions. The finite-element structural analysis method was used to study the effects of plate boundary conditions, plate aspect ratio & hole size, on the compressive buckling strengths of the perforated MMC plates. Studies show that by increasing the hole sizes, compressive buckling strengths of the perforated MMC plates could be considerably increased under certain boundary conditions and aspect ratios ("anomalous" buckling behavior); and that the plate buckling mode could be symmetrical or antisymmetrical, depending on the plate boundary conditions, aspect ratio, and the hole size.