

Impact response of multi slotted square column

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ABSTRACT

This work investigates the impact response of multi slotted square hollow section column. Abaqus Explicit finite element code was used to simulate the response of this structure subjected to varying impact speeds. A comparative study with the standard plain square column was carried out and it was found that the slotted column exhibited lower initial peak force (IPF) as compared to the plain column. Mean forces for both types of columns remained the same. Both types of columns exhibited different IPFs with different impact speeds. The number of slots on the slotted column also influenced the formation of folds during the progressive crushing. The low IPF is an important feature when designing for occupant and critical goods safety. Based on these preliminary findings, it is believed that impact performance of standard square column can be improved over a wider range of impact speeds and impact mass by correct placement of slots.

KEYWORDS:

Structural crashworthiness, impact response, square column, non-linear explicit finite element

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