

Performances of Two-Segment Crash Box with Holes under Oblique Load

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Abstract : Crash box design has been developed to obtain optimum energy absorption. In this study, two-segment crash box design with holes is investigated under oblique load. The deformation behavior and crash energy absorption are observed. The analysis was performed using finite element method. The crash test components were impactor, crash box, and fixed rigid base. Impactor and the fixed base material are modelled as a rigid, and crash box material as bilinear isotropic hardening. The models consist of 2 and 4 holes laid within $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ from first segment length. 100 mm aluminum crash box and frontal crash velocity of 16 km/jam were selected. Based on simulation results, it can be concluded that 2 holes located at $\frac{3}{4}$ has the largest crash energy absorption. This behavior associated with deformation pattern, which produces higher number of folding than other models.

Keywords : crash Box, two-segments, holes configuration, oblique load, deformation pattern

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