

عنوان مقاله:

Numerical Investigation of Aluminum Honey Comb Filled High Strength Steel Crash Box for the Effect of Honey Comb Physical Parameters on
Crashworthiness Constant

محل انتشار:

مجله علم مهندسی خودرو، دوره 7، شماره 4 (سال: 1396)

تعداد صفحات اصل مقاله: 17

نویسندگان:

K. ANNAMALAI

G. BALAJI

خلاصه مقاله:

Fillers can be employed as reinforcement in the design of automobile crash boxes to improve its performance in terms of energy absorption, expected crushing fashion and initial peak force magnitude. The current research focuses on the investigation of crashworthiness of the high-strength steel (HSS) columns filled with reinforced aluminium honeycomb fillers. The crashworthiness of HSS steel crash boxes embedded with aluminium honeycomb of varying thickness and cell sizes are investigated. Five variants of honeycomb thickness, namely; Thickness-1, Thickness-2, Thickness-3, Thickness-4, Thickness-5 and six variants of honeycomb cell size, namely; CellSize-1, CellSize-2, CellSize-3, CellSize-4, CellSize-5 and CellSize-6 are considered for the crash box analysis. Numerical crash analysis is performed for the novel reinforced sandwich honeycomb separated by steel plates in HSS crash box. A further study is also performed by inducing V-Notch triggers in the honeycomb to evaluate the effect of crashworthiness parameters. A comparative numerical investigation is performed to realize the effect of geometric parameters on the crashworthiness variables of crash boxes for low-velocity impact. The force versus displacement curves were derived and analyzed for each parameter variations and detailed comprehension of deformation pattern and energy absorption are provided. The objectives of the present work is to showcase the effect of honeycomb geometric parameters like thickness and cell size on crashworthiness parameters for low-velocity impact and also to represent the effect of sandwich honeycomb and honeycomb with V-Notch triggers methodology on the crashworthiness parameters like initial peak force (IPF), energy absorption (EA), specific energy absorption (SEA) and crush force efficiency (CFE)

کلمات کلیدی:

Crashworthiness, crash box, aluminum honeycomb, V-Notch triggers and energy absorption

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1865390>

