

SUMMARY

STEFANUS SUGIANTO, Mechanical Engineering, Faculty of Engineering, University of Brawijaya, Mei 2016, Crash Box Deformation Pattern and Energy Absorption Analysis on Configuration of Bead Placement and Beads Number Using Frontal Crash Test. Advisors : Moch. Agus Choiron and Sofyan Arief Setyabudi

Increased in traffic intensity have made vehicle safety one of the major research areas in engineering. The largest proportion of car accidents estimated about 60%, occurred on frontal direction of the vehicle. According to GAIKINDO in 2015, total MPV car sales was 545.055 units and its dominates in share market with 53,8%. Crash Box is passive system safety which located in between bumper and frame. The purpose of crash box is to absorb the kinetic energy from the collision in car accidents therefore the damage will not affect the passenger.

Objective in this study is to determine the optimum deformation pattern and energy absorption of square cross section Crash Box with beads. The function of beads is to trigger the folding on Crash Box's deformation process. Finite Element Method software is used to simulate in this study. Crash Box's Variation in this study are configuration on beads placement and number of beads on Crash Box's face. Crash Box will be crashed by impactor, where the impactor's mass is 103 kg and the velocity is 7670 mm/s.

Based on the simulation result, the optimum Crash Box with beads design is beads placement on 4 faces and number of beads is 4 beads. Deformation pattern that occurred on optimum Crash Box is mixed mode and the energy absorption is 6949,3 Joule.

Keywords : Deformation Pattern, Energy Absorption, Configuration of Beads Placement, Beads Number, Frontal Crash Test