

عنوان مقاله:

A Numerical Study on Aluminum Plate Response under Low Velocity Impact

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خلاصه مقاله:

In the present paper, a numerical study is performed to investigate the response of different plates aluminum alloys subjected to low velocity impact condition. In this regard, the square AA5083-H116 aluminum plates with dimensions 300×300 and 3 and 5 mm thick under low velocity impact are modelled, and a mesh convergence study is carried out to decide the appropriate number of elements. In this research, the influence of strain rate effects in low velocity impact response is examined by doing a comparative study using the isotropic elasto-plasticity and the Johnson-cook material models. The response to impact events of models including deflection history and maximum and permanent deflection is extracted and validated by available numerical and experimental data in literature. The results indicate that the strain rate has a significant influence on time histories and increases the accuracy of the predicted data. Then, using the developed modeling procedure, the behavior of three aluminum alloys under low velocity impact is investigated based on Johnson-Cook model. The results show that 7075-T6 and 6061-T6 alloys have the highest and lowest stiffness, respectively. Also, the lowest rate of absorbed energy to mass is observed in the 7075-T6 alloy

کلمات کلیدی:

Low Velocity Impact, Finite Element Modeling, Aluminum Plate, Johnson-cook Model, Strain Rate Effects

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