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Md. Muslim Ansari, Anupam Chakrabarti

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Md. Muslim Ansari[1, *], Anupam Chakrabarti[2]

[1] Department of Civil Engineering, Indian Institute of Technology Roorkee, INDIA, 247667

* Corresponding Author; Tel: No. +91 9997365104

muslimdecivil@gmail.com

[2] Department of Civil Engineering, Indian Institute of Technology Roorkee, INDIA, 247667

achakfce@iitr.ac.in

Abstract

This paper presents a numerical investigation of penetration and perforation behavior of FRP composite plate under impact. The reported numerical investigation is carried out using AUTODYN hydro code in which the shock effect due to impact has also been incorporated in the modeling. Here the study has been focused on the progressive damage behaviour and modes of damage evolution in laminated FRP composites under impact. The variation of ballistic limit, residual velocities, damage pattern in the target as well as in the bullet, depth of penetration, contact force, deflection and radius of damaged area are also studied. The effects of boundary conditions, thickness to span ratio, span of target plate and thickness of lamina on ballistic limit, residual velocity and damage pattern have been presented in this paper. The present numerical results are compared with the results available in the literatures showing close agreements. Many new results are generated to highlight the three dimensional progressive damage patterns and perforation behavior of laminated composite plates under impact.

Keywords

FRP composite, Impact load, Finite element model, Damage modes, Boundary conditions