

## Analysis of High-Velocity Impacts on Concrete

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**Abstract :** This research analyses the response of two distinct types of concrete blocks, each possessing an approximate unconfined compressive strength of 30MPa, when exposed to high-velocity impacts produced by an Explosively Formed Penetrator (EFP) traveling at an initial velocity of 1200 m/s. Given the scarcity of studies exploring high-velocity impacts on concrete, the primary aim of this research is to scrutinize how concrete behaves under high-speed impacts, ultimately contributing valuable insights to the development of protective structures. To achieve this objective, a comprehensive numerical analysis was carried out in LS-DYNA to delve into the fracture mechanisms inherent in concrete under such extreme conditions. Subsequently, the obtained numerical outcomes were compared and validated through eight experimental field tests. The methodology employed involved a robust combination of numerical simulations and real-world experiments, ensuring a comprehensive understanding of concrete behavior in scenarios involving rapid, high-energy impacts.

**Keywords :** high-velocity, impact, numerical analysis, experimental tests, concrete

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