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Experimental and Numerical Investigation on the Ballistic Resistance of Double-Layered Steel Plates XINKE XIAO, WEI ZHANG, ZITAO GUO, GANG WEI — The ballistic perforation resistance of double-layered steel plates impacted by flat-nosed projectiles was investigated both experimentally and numerically. In the tests, 10 mm thick (intact or spaced by 200 mm gap space) targets of Q235A steel were impacted using a gas-gun at sub-ordnance velocity, and the ballistic limit velocity of the different target configurations was obtained. The Johnson-Cook strength and fracture models were used in the finite element simulations, where the model constants were calibrated by preliminary material tests and taken from open literature. In general, good agreement was obtained between the numerical simulations and the experimental results. It was found that the ballistic resistance of spaced targets suffers from large divergence due to the projectile's different residual attitude after perforation of the front plate, and that it seems the initial-residual velocity data yield to two groups and therefore give birth to two ballistic limit velocities. However, the overall ballistic resistance of the spaced targets is less than that of the in contact ones.

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