

Response Characteristics of Polymer Bonded Explosive in Compression and Shear Test

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Abstract: To study the response characteristics of polymer bonded explosive (PBX) under the effect of compression and shear, the response test for PBX-932 and PBX-C43 with same dimension of $\phi 20$ mm \times 40 mm in the impact velocity of 22–57 m \cdot s⁻¹ were performed by a designed compression / shear test device. The pressure change process in the experiments was measured by pressure gauges. The impact process was analyzed by high-speed motion pictures. The reaction overpressure of explosive was measured by shock wave overpressure sensor. The response characteristics for two explosive were analyzed. Results show that the damage of PBX increases with impact velocity rising. The impact velocity threshold of PBX-C43 and PBX-932 under the action of pressure range of 160–400 MPa and pulse width of 1.5 ms is 25.5–27.7 m \cdot s⁻¹ and 22.7–24.4 m \cdot s⁻¹, respectively. The reaction degree for two explosive is basically identical.

Key words: compression and shear; reaction response; polymer bonded explosive (PBX)

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