

Thermoplastic explosive compositions explosion resistance at the impact of cumulative charge jet

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The work presents the results of the investigation into explosion resistance of thermoplastic TATB- and HMX-based explosive compositions at the impact of cumulative jet. The study was conducted using cylindrical samples with the diameter of 120 mm and 60 mm high, packed into the steel case. The cumulative charge was a HMX-based charge sealed in the steel casing with a spherical cumulative cladding. Cumulative charge height was 48 mm and the diameter—38 mm. The fact of the explosive transformation was registered via radiowave technique, with the help of scanning waveguide, and electric-contact technique, using electriccontact sensors made as a twisted-pair. If there was no explosion transformation, cumulative jet propagation speed was determined in the HE samples, and in case the explosion transformation took place, the detonation speed and the detonation depth were assessed. HE sample cumulation resistance was assessed according to Held criterion. The results showed that in case of cumulative jet impact on the TATB-based sample there was an absence of the HE explosion decomposition, at the same time a through-hole was formed with the diameter of 20 mm. The average cumulative jet speed in the sample was 1.8 km/s. At the cumulative jet impact against the HMX-based sample, detonation transformation takes place almost from the sample surface. In this case detonation wave velocity exceeded 8 km/s.