

Numerical modeling using the LEGAK methodology of experiments on radial and end throwing of a copper shell by an explosion of aluminized explosive based on octogen

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In this work, the results of numerical modeling with the use of the LEGAK method of a series of four experiments on measuring the free surface velocity using the photon Doppler velocimetry (PDV) method during radial and end throwing of copper shells by an explosion of a plastisol composition based on octogen with 8 wt. % of Al are presented. It has been shown that using equations of state for explosion products constructed using thermodynamic calculations allows satisfactory agreement between calculated and experimental data on radial and end-on throwing. The fact that the results of thermodynamic calculations conducted under the assumption of non-reactive aluminum were used to construct the equations of state suggests that an 8 wt. % aluminum addition does not have a positive effect on the blasting action of the composition at low expansion rates. Using a special algorithm for determining the parameters of the Chapman–Jouguet point for “porous” compositions, satisfactory agreement with experimental data on the dependence of the propagation velocity of the detonation wave on the initial density of the composition was obtained.