

RESEARCH OF THE SHOT PARAMETERS OF THE GAS DETONATION THROWING SYSTEM

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The specificity of modern military conflicts is related to the conduct of combat operations in highly urbanized areas and necessitates the installation of modern means of close combat fire damage on armored vehicles.

The report considers the difference between combustible gas systems for deflagration and detonation combustion and the dependence of the initial velocity of the projectile in the gas detonation system on the initial pressure of the detonation products [1, 2].

Therefore, the loss of the charge, which penetrates into the gaps between the projectile and the barrel, contributes to the decrease in the speed of the projectile. The peculiarity of detonation combustion is that the speed of detonation depends only on the initial thermodynamic state and composition of the reacting gas-fuel mixture [3]. In addition, the authors present the results of research under different conditions of the degree of expansion of the detonation products, the geometric dimensions of the chamber and the specific mass of the projectile.

It is shown that in order to increase the initial velocity of the projectile in the gas detonation throwing system, it is advisable to increase the degree of expansion of the detonation products in the range from 3 to 7. To limit the maximum pressure of the detonation products under the conditions of achieving high projectile velocities, it is proposed to increase the size of the chambers.

According to the calculated speeds, we have that detonation throwing systems potentially meet the requirements for systems that can be used on armored vehicles. For throwing objects weighing 5–10 kg, the device must be used on a propane-oxygen mixture with an initial pressure of 1 MPa, or on a propane-air mixture with a charge pressure of 5 MPa.

References:

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