The Use of Light Armours for Protection Against Shaped Charge Projectiles

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Abstract

The article describes various examples of protection of light fighting vehicles armoured with additional reactive armours. The ways of protecting of these vehicles with use of the compositereactive armours against penetration with HEAT projectiles (with a penetration ability of 300 mm RHA) and against small calibre (up to 14,5 mm) armour-piercing bullets are shown on the example of the BWP-1. Technical parameters of the CERAWA-1 armour and its assembly on BWP-1 are presented. The work also includes results of static tests of several versions of reactive-passive panels of the light fighting vehicles against PG-7 projectiles perforation at the angles of 60° and 72° from normal to the cassette surface. The panels contained ERAWA-1 cassettes made of aluminium alloy.

The best protection was provided by the reactive-passive armour in the one version and the shaped charge jet did not pierce the plate 1 of 500×500 mm size for both the angles of $\alpha = 72^{\circ}$ and $\alpha = 60^{\circ}$. There was also no deflection of the steel armour witness plate of $600 \times 500 \times 8$ mm size as a result of the initiation of the explosive of the shaped charge jet projectile and the ER-AWA-1 cassette.

For the other versions the deflections of the steel armour witness plates occurred for $\alpha = 60^{\circ}$ and $\alpha = 72^{\circ}$ setting angles of the shaped charge jet of PG-7 projectile from normal to the cassette surface; the deflections were caused by the smaller distances between the plates 1 and 2.

After the perforation of the reactive-passive armour on the surface of the hull of the protected vehicle, small craters with a depth of several millimetres and traces of dispersed copper from the shaped charge jet of PG-7 can occur.

Depending on the surface mass of the light reactive-passive armour panels, different levels of damage to the armour witness plate were achieved.

Keywords: explosive reactive armour, armour protection, materials technology, shaped charge projectile