

Effect of Expanding Angle and Initiation Position on the Performance of Axial-expanding Directional Warhead

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Abstract: To study the damage efficiency of axial-expanding directional warhead, AUTODYN software was systematically used to analyze the influence of the expansion angle and the initiation position on the fragment performance of axial-expanding directional warhead. The influence law of the axial expansion angle and the initiation position of warhead on the formation of fragment mass distribution, flying dispersion velocity and flying dispersion angle was obtained. Results show that the velocity of the forward explosively formed projectile (EFP) decreases with the increase of the axial expansion angle, while increasing the length-diameter ratio of EFP, taking the wing-diameter ratio of about 4.2, increasing the axial expansion angle of the warhead can improve the percentage of effective fragment mass, and the maximum flying dispersion velocity of the fragment appears at about 33.33% from the initiation end. The percentage of effective fragment of warhead at the outer side of the charge is up to 67.57%. Selecting the axial expansion angle of the warhead as about 60°, and the initiation point located at the outer side of the charge, can realize the effective damage function of directional and convergent strike of axial-expanding directional warhead.

Key words: axial expansion angle; directional warhead; fragment mass distribution; flying dispersion velocity; flying dispersion angles

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