

Electric Burst Characteristic of Exploding Foil before and after Aging

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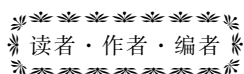
Abstract: In order to study the storage characteristic of exploding foils, the accelerated life test at high temperature of 90 °C and high temperature and humidity of 80 °C, RH 95% were carried out. The appearance, morphology, burst characteristic and flyer velocity were studied by photograph, SEM, fire test and photonic doppler velocimetry (PDV) method. Results show that after aging at 80 °C, RH 95%, the surface of exploding foil is oxidized, and the surface color changes significantly due to the Cl element and humidity, and the average resistance obviously increases from 30.3 mΩ (before aging) to 66.8 mΩ (after aging). There is no remarkable influences of high temperature (90 °C) on burst current, burst voltage and explosion time of exploding foil. While the burst voltage and explosion time significantly decrease after aging at 80 °C, RH 95%. The performance of exploding foil adhesion to polyimide film becomes poor after aging. The PDV test results show that with the increasing of acceleration time, the flyer velocity decreases from 3600 m · s⁻¹ to 2100 m · s⁻¹ at 90 °C and 1200 m · s⁻¹ at 80 °C, RH 95%. The ability to drive slapper decreases after aging. The storage condition of high temperature and humidity has a stronger effect on flyer velocity than that of high temperature.

Key words: initiator; exploding foil; aging; electric burst characteristic; flyer velocity

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