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Title: Interior Ballistic Performance of the Sheet Multilayer Propelling Charge

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关键词: [多层发射药](#); [内弹道性能](#); [燃烧性能](#); [密闭爆发器实验](#); [阻燃剂](#)

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摘要: 制备了片状多层发射药, 内层选用燃速较高的高能发射药, 外层为含有高分子阻燃材料的低燃速配方发射药。对不同阻燃剂含量和不同厚度比的片状多层发射药进行了密闭爆发器实验和30mm模拟弹道炮试验。结果表明, 外层阻燃剂含量不同的MD1和MD2多层发射药均有较好的燃烧渐增性, 外层阻燃剂含量较高的MD2多层发射药的燃烧渐增性要优于MD1多层发射药; 在保证最大膛压基本不变的情况下, 外内层厚度比为1:10的MD1发射药的初速较5/7单基药的初速提高77.4m/s, 外内层厚度比为1:5的MD2初速较5/7单基药的初速提高108.7m/s。因此得出, 通过调节多层发射药外层阻燃剂含量和外内层的厚度比, 可以实现增加装药量、提高炮口初速而保持最大膛压不变。

Abstract: The sheet multilayer propelling charge was made. The inner of the charge was made of high energy propellant with higher burning rate and the outer one was made of low burning rate propellant containing macromolecular deterrent material. The sheet multilayer charge with different content of deterrent material and different layer constructions was investigated by closed bomb test and 30mm simulation gun shootong. The experimental results show that MD1 and MD2 multilayer charge containing different contents of deterrent both have good progressive combustion performance and MD2 is better than MD1, the muzzle

velocity of MD1 with outer to inner layer thickness ratio of 1 : 10 increases 77.4m · s⁻¹ than that of 5/7 single base propellant, the muzzle velocity of MD2 with thickness ratio of 1 : 5 increases 108.7m · s⁻¹ than that of 5/7 single base propellant while keeping max pressure almost constant. The results also show that by changing deterrent content in the outer layer and the ratio of the outer to inner layer thickness of the sheet multilayer propellant, the effect of increasing the total charge mass and so as to raise the muzzle velocity without maximum pressure increment could be expected.

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