

Examination of Bullet Holes Produced with Non-Jacketed Ammunition using Digital Radiography¹

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Introduction

The identification of bullet holes is important in reconstructing shooting incidents. After attending this presentation, participants will be familiar with: (1) examining bullet holes using a NOMAD X-ray device; (2) reviewing radiographs for the presence of residual bullet metal in plasterboard, wood and plastic substrates and (3) some factors that affect the transfer of bullet metal to bullet holes. Portable X-ray equipment may be used at the scene to examine suspected bullet holes for the presence of residual metal. The use of this equipment could be an alternate to chemical testing for the presence of lead in suspected bullet holes.

Experimental Methods

Sections of plasterboard, wood and plastic with different thicknesses were prepared as substrates for producing bullet holes. The materials represented various types of wall sections. One hundred and twenty bullet holes were examined in the following types of substrates. Sections of substrates and thickness used for the study included: plaster board (15.88 mm), attached to pine boards (19.05 mm), pine (44.45 mm), plywood (15.88 mm), particle board (9.53 mm), Luan (3.18 mm), plastic (2.0 mm) and sections of laminated veneer lumber (44.45 mm). A muzzle-to-target distance of one meter was used to produce the bullet holes for examination. The handguns used to produce the bullet holes included a .22 caliber revolver, .38 caliber revolver and a 9 mm pistol. The types of ammunition included .22 caliber lead round nose, .22 caliber lead coated round nose, .38 caliber round nose and 9 mm lead round nose bullets.

Results, Discussion and Conclusion

Out of 120 bullet holes examined in seven different substrates, 80 had traces of metal in the bullet holes that were visible on radiographs. Of 70 bullet holes in wood sections, 57 had traces of metal in the bullet holes that were visible on radiographs. The Luan and particle board substrates yielded the least number of radiographs with traces of metal. Only 9 out of 40 bullet holes produced radiographs with metal. As a nondestructive test, the NOMAD X-ray device could be used at scenes to test bullet holes for the presence of non-jacketed and coated lead bullets for traces of lead.



¹ Abstract for paper presented at the 7th European Academy of Forensic Sciences, Prague, Czech Republic, September 2015