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Recovery of fingerprints from brass cartridge cases

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This work consists of testing and comparison of techniques to recovery fingerprints from brass cartridge cases. The tested techniques were powdering (regular powder dusting and magnetic powder application), cyanoacrylate fuming, fluorescent dying (basic yellow 40), gun blueing solutions and acidified hydrogen peroxide solutions. The tests were performed on brass discs subjected to three different temperatures (room temperature, 63 and 200°C), and on fired and unfired cartridge cases. All the samples were processed after three different periods of time (24 h, 7 and 14 days) after deposition. The best results for both fired and unfired cartridge cases were obtained by the sequential application of cyanoacrylate, gun blueing solution and basic yellow 40. Some stages of the firing process were isolated in order to identify their effects over the final amount and quality of the remaining latent fingermarks on cartridge cases. Good state fingermarks were developed on unfired cartridge cases cycled through the gun, showing that friction inside the gun without firing does not cause significant damage to the fingermarks. On the other hand, fired cartridge cases are significantly affected by the firing effects, exhibiting low quality ridge details which are mainly located next to base. An unexpected phenomenon was observed on most of the brass discs heated to 200°C and developed with gun blueing solutions; they presented a reverse development compared to the expected one, with darkening of the ridges instead of the background.

Biography

Carlos M A Girelli is completing his PhD in Physics in the Federal University of Espirito Santo State and he is also Bachelor in Law and Post Graduated in Public Safety. He is fingerprint expert and has worked for the last 11 years in the Identification Group of the Federal Police Department of Brazil in the Espirito Santo State.

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