

# Microstamping Guns Feasible but Flawed, Study Finds

May 3 2007

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New technology to link cartridge cases to guns by engraving microscopic codes on the firing pin is feasible, but does not work well for all guns and ammunition tested in a pilot study by researchers from the forensic science program at UC Davis. More testing in a wider range of firearms is needed to determine the costs and feasibility of a statewide program of microstamping, as called for by proposed state legislation, the researchers said.

The technology developed by ID Dynamics of Londonderry, N.H., uses a laser to cut a pattern or code into the head of a firing pin. The method is similar to that used to engrave codes on computer chips. When the trigger is pulled, the firing pin hits the cartridge case or primer and stamps the code onto it. In principle, the spent cartridge can then be matched to a specific gun.

If successfully implemented, microstamping would be one additional piece of evidence for investigators to gather in building a criminal case, said Fred Tulleners, director of the forensics program at UC Davis. Tulleners was formerly director of the California Department of Justice crime lab in Sacramento, as well as the Sacramento and Santa Rosa county crime labs.

UC Davis graduate student Michael Beddow tested firing pins from six different brands of semi-automatic handguns, two semi-automatic rifles and a shotgun. The firing pins were engraved with three different types of code: a letter/number code on the face of the firing pin; a pattern of

dots or gears around the pin; and a radial bar code down the side of the pin.

To test the effects of repeated firing, Beddow fitted engraved firing pins into six Smith and Wesson .40-caliber handguns that were issued to California Highway Patrol cadets for use in weapons training. After firing about 2,500 rounds, the letter/number codes on the face of the firing pins were still legible with some signs of wear. But the bar codes and dot codes around the edge of the pins were badly worn.

"They were hammered flat," Beddow said.

Tests on other guns, including .22, .380 and .40-caliber handguns, two semi-automatic rifles and a pump-action shotgun, showed a wide range of results depending on the weapon, the ammunition used and the type of code examined, Beddow found. Generally, the letter/number codes on the face of the firing pin and the gear codes transferred well to cartridge cases, but the bar codes on the sides of the firing pin performed more poorly. Microstamping worked particularly poorly for the one rimfire handgun tested.

The researchers did not have access to information allowing them to read the bar- or gear-codes, and so could not determine if these remained legible enough to be useful.

Codes engraved on the face of the firing pin could easily be removed with household tools, Beddow found.

The researchers estimated that setting up a facility to engrave the firing pins of every handgun sold in California would cost about \$8 per firing pin in the first year, falling to under \$2 per firing pin in subsequent years, Tulleners said.

Tulleners said that a larger test of about 3,000 firing pins, from a wider range of guns, would allow for a more "real-world" test of the technology. About 650 brands of handguns are sold in California, compared with the nine tested, Beddow estimated in the study. A bigger study would also help show how useful this technology might be in detecting and preventing crime.

The study was commissioned by the California Policy Research Center at the request of the California Legislature.

"We want to make sure that the legislature has good information if they are going to make decisions about this," Tulleners said.

David Howitt, professor of chemical engineering and materials science and chair of the Graduate Group in Forensic Science at UC Davis, supervised the project. Howitt said that while the technique tested here has limitations, there are other possible ways to implement microstamping. For example, an ultra-hard ceramic that would be extremely difficult to file off could be used to make the impression, instead of the relatively soft firing pin.

More university involvement is needed to address these sorts of forensic science issues from their inception, Howitt said.

Source: UC Davis

Citation: Microstamping Guns Feasible but Flawed, Study Finds (2007, May 3) retrieved 10 April 2024 from <https://phys.org/news/2007-05-microstamping-guns-feasible-flawed.html>

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