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University of California at Davis Study – Background on Firearms Microstamping Technology

Last year, the California Legislature considered legislation (A.B. 352) similar to AB 1471. Prior to rejecting AB 352, the Legislature requested a state-funded study of microstamping technology by forensic experts and researchers at the University of California at Davis (“U.C. Davis”). The study’s results have just been released (*What Laser Machining Technology Adds to Firearm Forensics: How Viable are Micro-Marked Firing Pins as Evidence?* Howitt, Tulleners, Beddow, 2007). The goal of the study was to evaluate the micro-serialization of firing pins so that legislators could make informed decisions regarding the efficacy of this new technology for facilitating the identification of forensic evidence in firearm-related crimes. Tests were performed to determine:

- The durability and longevity of an array of micro-characters laser-machined onto firing pins;
- The legibility (reproducibility and readily decipherable) of the imprint of the micro-characters on ammunition (cartridge casing); and,
- The ease with which micro-characters can be intentionally defaced or obliterated.

The study found that micro-characters laser engraved on the ID Dynamics-supplied firing pins tested suffered varying degrees of degradation; in some cases severe degradation. The markings micro-characters laser engraved onto the tip firing pins did not reliably and consistently “copy” or imprint (impress) the information onto the primer of the expended cartridge case. The test results were also impacted by the type and brand of ammunition used in the test. The design and normal operation/functioning of the firearm tested influenced the results, i.e. depth of firing pin indentation (impression) on the primer, whether the firearm produced “firing pin drag,” whether it produced multiple firing pin strikes on the primer that obliterated or deformed some or all of the impressions of the micro-characters on the cartridge casing. The technology did not work at all on rimfire firearms and ammunition, which are very common. The results were also impacted depending on the nature of the micro-characters laser engraved on the firing pin, i.e. alphanumeric code, a “gear code” or radial bar code. Notably, due to size/space limitations and the geometry of firing pins, ID Dynamics is incapable of producing alphanumeric coded firing pins with enough micro-characters to display the name of the manufacturer, the model and serial number of the firearm on the tip of the firing pin, as called for by H. 6343. The radial bar code and dot code firing pins degraded more rapidly than the alphanumeric coded firing pins and were less reliable.

The study’s author conducted a blind test of 48 expended casings he had collected during test firings and determined the micro-characters were legible. He had other researchers who, unlike the author at the time of his examination, did not know in advance what micro-characters were present on the firing pin of the firearm used, to see if they could read the micro-characters. The results of this blind test showed that in only 20% of the time did they reach the same conclusion, establishing that subjective interpretation of the examiner is a variable impacting results.

Importantly, the study established “that the micro-characters could easily be intentionally destroyed” in less than 30 seconds using common household tools and objects readily available to the general public without effecting the ability of the firearm to function (the material removed from the firing pin did not shorten it to the point that the firearm would not fire).

The U.C. Davis study concludes: The researchers at U.C. Davis found this patented technology “flawed” and concluded that **“At the current time it is not recommended that a mandate for implementation of this technology in all semiautomatic handguns in the state of California be made. Further testing, analysis and evaluation is required.”** (Italicized in the original)