



OSAC Research Needs Assessment Form

Title of research need: Study to Assess The Accuracy and Reliability of Firearm and Toolmark

Keywords: black box, toolmarks, validation, firearms, forensic science

Submitting subcommittee(s): Firearms & Toolmarks **Date Approved:** 29Jan16

(If SAC review identifies additional subcommittees, add them to the box above.)

Background information:

1. Description of research need:

A large scale study using a black box approach similar to the approach used in the cited reference.

2. Key bibliographic references relating to this research need:

- Ulery BT, et al. "Accuracy and Reliability of Forensic Latent Print Decisions" 2011 108(19) pp. 7733-7738.
-Baldwin, D.P., Bajic, S.J., Morris, M., and Zamrow, D., "A Study of False-Positive and False-Negative Error Rates in Cartridge Case Comparisons", Ames Laboratory, USDOE Technical Report #IS-5207, April 7, 20014.

3a. In what ways would the research results improve current laboratory capabilities?

-The "black box study" of latent print comparison has provided the general scientific community a good measure of the overall reliability of latent print comparison. Additionally, the forensic science discipline of latent print comparison appears to have learned a great deal of what type(s) of errors occur. This data is useful for the design of analysis protocols, casework documentation, and validation. While validation studies of firearms and toolmark analysis schemes have been conducted, most have been relatively small data sets. If a large study were well designed and has sufficient participation, it is our anticipation that similar lessons could be learned for the firearms and toolmark discipline.

-In conjunction with this study, it is our hope the researchers could assess examiner experience, and education to see if it correlates with error rates. It would also be of interest to include a population of study participants with zero experience as a comparison.

3b. In what ways would the research results improve understanding of the scientific basis for the subcommittee(s)?

This research could assist the subcommittee understand the rate of errors and what type of errors occur. Additionally, if it were learned that additional examination or validation provided protection against these errors, the subcommittee would have better information for writing analytical, documentation and case review standards.

3c. In what ways would the research results improve services to the criminal justice system?

This research would provide additional data to help the justice system assess the overall error rate of the firearm and toolmark discipline and fulfill one of the Daubert criteria (error rate).

4. Status assessment (I, II, III, or IV):

II

	Major gap in current knowledge	Minor gap in current knowledge
No or limited current research is being conducted	I	III
Existing current research is being conducted	II	IV

This research need has been identified by one or more subcommittees of OSAC and is being provided as an informational resource to the community.

Subcommittee

Approval date: 2/9/16 via Kavi Ballot

(Approval is by majority vote of subcommittee. Once approved, forward to SAC.)

SA

1. Does the SAC agree with the research need? Yes

2. Does the SAC agree with the status assessment? Yes

If no, what is the status assessment of the SAC:

Approval date: 17-Mar-2016

(Approval is by majority vote of SAC. Once approved, forward to NIST for posting.)