



OSAC Research Needs Assessment Form

Title of research need: Assessment of Examiners' Toolmark Categorization Accuracy

Keywords: Toolmarks, firearms, class characteristics, subclass, elimination criteria

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

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

Background information:

1. Description of research need:

We are unaware of any study that assess the overall firearm and toolmark discipline's ability to correctly/consistently categorize evidence by class characteristics, identify subclass marks, and eliminate items using individual characteristics.

2. Key bibliographic references relating to this research need:

n/a

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

- Past validation studies have focused on the firearm and toolmark disciplines overall ability to correctly identify items using individual toolmarks. We are unaware of any studies that focused on the discipline to correctly characterize class characteristics and eliminate samples.
-Additionally, we are unaware of any studies that assess examiner accuracy in recognizing true subclass characteristics.
-Additionally we are unaware of any studies that assess the interpretation of individualizing features from a lay person or a trained and experienced examiner.
-Finally it is recognized differences of individual marks can be a basis for eliminations. However well-defined criteria for this type of elimination are not found in the literature. The accuracy of these eliminations as well as developing criteria could be conducted in parallel with this study.

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

Understanding the overall accuracy of class characteristic categorization and eliminations will help the subcommittee determine how much detail is necessary when writing our testing procedures and examination standards. Understanding training and experience levels would allow the committee to write standards defining experience needed and assist in developing entrance exams to assess a potential hire's aptitude for pattern recognition.

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

Further studies assessing and documenting the accuracy of examiners will help the justice system assess the overall error rates of the toolmark examinations.

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

I

	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.)