

OSAC RESEARCH NEEDS ASSESSMENT FORM



Title of research need: Discrimination and evidential value of architectural and maintenance paints

Keyword(s): forensic science, trace evidence, paint, discrimination studies

Submitting subcommittee(s): Trace Materials **Date Approved:** 6/12/2025

Background Information:

1. Does this research need address a gap(s) in a current or planned standard? (ex.: Field identification system for on scene opioid detection and confirmation)

Different standard documents (e.g., ASTM E1610-18 Standard Guide for Forensic Paint Analysis and Comparison, ASTM WK57479, and Revision of ASTM E2809-13 Standard Guide for Using Scanning Electron Microscopy/X-Ray Spectrometry in Forensic Paint Examinations) cover the analysis of paint specimens. One of the current gaps related to these documents is current available knowledge about the ability of these methods to differentiate modern coating systems of non-automotive sources (i.e., architectural and maintenance).

2. Are you aware of any ongoing research that may address this research need that has not yet been published (e.g., research presented in conference proceedings, studies that you or a colleague have participated in but have yet to be published)?

No. All previous studies are (relatively) outdated.

3. Key bibliographic references relating to this research need: (ex.: Toll, L., Standifer, K. M., Massotte, D., eds. (2019). Current Topics in Opioid Research. Lausanne: Frontiers Media SA. doi: 10.3389/978-2-88963-180-3)

- Buzzini, P., Massonnet, G., Birrer, S., Egli, N. M., Mazzella, W., & Fortini, A. (2005). Survey of crowbar and household paints in burglary cases—population studies, transfer and interpretation. *Forensic science international*, 152(2-3), 221-234.
- Castle D.A., Curry C.J., Russell L.W., A survey of case-openers, *Forensic Sci. Int.* 1984, 24, 285–294.
- Dolak E., Weimer R., The physical and chemical characterization of multipurpose architectural paint, *J. Am. Soc. Trace Evid. Exam.* 2015, 6, 21–45.
- Krausher C.D.J., Characteristics of aerosol paint transfer and dispersal, *Can. Soc. Forensic Sci. J.*, 1994, 17, 125–142.
- Lambert D., Muehlethaler C., Esseiva P., Massonnet G. Combining spectroscopic data in the forensic analysis of paint: Application of a multiblock technique as chemometric tool. *Forensic Science International* 2016, 263, 39-47.
- Ryland S.G., Infrared microspectroscopy of forensic paint evidence, in: Humecki H.J. (Ed.), *Practical Guide to Infrared Microspectroscopy*, CRC Press, Boca Raton, FL 1995, 177–258.
- Wright D., Bradley M.J., Mehlretter A.H. Analysis and discrimination of single-layer white architectural paint samples. *Journal of Forensic Sciences* 2013, 58(2), 358-364.

4. Review the annual operational/research needs published by the National Institute of Justice (NIJ) at <https://nij.ojp.gov/topics/articles/forensic-science-research-and-development-technology-working-group-operational#latest>? Is your research need identified by NIJ?

No.

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

Information gathered from this research is expected to help trace evidence examiners gaining knowledge on potential changes of physical and chemical properties (i.e., composition) of modern coating products, knowledge about new trends in the current market, information about the most discriminating features that can be collected from paint specimens and used during comparative examinations, and behavior of the studied materials to transfer and persist. Other relevant aspects may be the use of analytical information for investigative purposes (i.e., investigative leads or case linkage).

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

The subcommittee would benefit from the research in two primary ways: 1) Research leading to a) the development of new approaches for characterization, b) the refinement or improvements of existing ones, or c) a deeper understanding on how various methods can be applied within an analytical sequence; 2) provide practitioners with sound guidance on how to qualify association types in the context of comparative examinations. Both ways are critical during the revisions of current standard documents.

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

Trace evidence examiners will be in a better position to characterize, discuss limitations, and interpret paint systems that are widely occurring in our environments given that research on their properties is currently inexistent or outdated.

8. 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.