OSAC RESEARCH NEEDS ASSESSMENT FORM

Title of research need: Discrimination of Duct Tape Fibers by Fluorescence Microscopy

Keyword(s): duct tape, scrim, fluorescence microscopy, warp, weft, yarns

Submitting subcommittee(s): Chemistry 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)

Yes; The in-progress draft Standard Guide for Forensic Examination of Fibers and Textiles using Fluorescence; ASTM E3233 Standard Practice for Forensic Tape Analysis Training Program; and ASTM E3260 Standard Guide for Forensic Examination and Comparison of Pressure Sensitive Tapes

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; we are not aware of any ongoing research in this area.

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)

Mehltretter AH and Bradley MJ, "Forensic Analysis and Discrimination of Duct Tapes," JASTEE, Vol. 3, Issue 1, pp. 2-20 addresses duct tape fiber analysis at the yarn level for one wavelength region.

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?

The research would demonstrate the utility of fluorescence microscopy during the examination and comparison of duct tape fibers. The utility of different fluorescent wavelengths, in addition to the UV range, could be determined, as could the comparative value of the variation of colors that may be observed under the fluorescence between synthetic and natural fibers comprising the scrim.

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

The results of research in this area would provide more detailed knowledge not within the current scientific literature.

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

The addition of fluorescence microscopy to the process of duct tape comparison may enhance the capability of discrimination between duct tape samples.

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

	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.