

Conducting Duct Tape Sourcing Searches in the National Forensic Tape File (NFTF) Using Spectral Library Identification and Classification Explorer (SLICE)

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1 INTRODUCTION

The National Forensic Tape File (NFTF) is a collection of various tapes collected by FBI Laboratory personnel from tape manufacturers or retail outlets. Acquisition information, physical characteristics, and analytical data about each tape sample are compiled in a searchable database known as Spectral Library Identification and Classification Explorer (SLICE). This collection can be utilized in duct tape sourcing investigations to develop manufacturer and product information about duct tape evidence. The NFTF can also be used in conjunction with information available from industry contacts.

2 SCOPE

This general procedure applies to Chemistry Unit caseworking personnel who utilize the NFTF reference samples and SLICE database for duct tape sourcing.

3 EQUIPMENT

- NFTF
- PC capable of running the SLICE software program or of connecting to the virtual machine
- SLICE software (xk, Inc., EDAX)

4 PROCEDURE

- A. Utilizing guidance provided in PP-800, evaluate the physical characteristics and chemical composition of a tape specimen. Not every technique need be conducted before searches commence.
- B. Conduct searches through SLICE using the physical characteristics and/or chemical composition of the tape specimen. It is recommended that the search criteria be limited to duct tapes.
 1. A best fit search can be conducted using the spectrum of the tapes' adhesive or backing. The candidate list will be provided in order of best to least fit.
 2. Drop down menus for certain physical characteristics (e.g., weave, backing color) can be selected and searched. If a best fit search has not been indicated, any reference tape that meets the criteria selected will be included in the candidate list. If a best fit search has been selected, the candidate list will be in order of best to least fit and will only include references tapes that meet all selected criteria.
 3. A range for the scrim count can be searched. Results will be displayed as in 4B.2.

4. A text-based search (e.g., organic composition) can be selected to further narrow the search results. Results will be displayed as in 4B.2.

C. One possible search procedure is as follows:

1. Perform a best fit search of the tape's adhesive. Compare the spectrum of each successive candidate until the spectra no longer compare favorably with the questioned sample spectrum. If the list of candidates is still too numerous to manage, repeat the search with additional physical characteristics included. Determine if any possible candidates can be eliminated by comparing the remaining information available for the samples in the candidate list.
2. Perform a best fit search of the tape's backing. Compare the spectrum of each successive candidate until the spectra no longer compare favorably with the questioned sample spectrum. If the list of candidates is still too numerous to manage, repeat the search with additional physical characteristics included. Determine if any possible candidates can be eliminated by comparing the remaining information available for the samples in the candidate list.
3. Cross-reference the candidates remaining from the search described in 4C.1 to the candidates remaining from the search described in 4C.2. Any candidates found in common can be directly compared to the questioned tape specimen.

D. Compare the color, appearance, and the acquired Fourier transform infrared spectroscopy (FTIR) and X-ray diffraction (XRD) data of the evidentiary tape specimen to the selected tape standards.

E. If a particular manufacturer or product cannot be eliminated as a candidate, contact the manufacturer to see if the information can be corroborated.

5 ACCEPTANCE CRITERIA

If a duct tape reference standard compares favorably in physical characteristics and chemical composition to the evidentiary duct tape specimen, record as a candidate.

6 LIMITATIONS

- A. Not every duct tape product is represented in NFTF.
- B. Sample condition can preclude conducting certain examinations, such as color assessment.
- C. Some data entry errors may exist in the database. Verify search results using orthogonal resources when practicable.

D. Color differences (adhesive or backing), thickness, and width can occur between questioned and reference samples, which may not eliminate the reference tape as a potential candidate.

7 REFERENCES

PP-200, FBI Laboratory, Chemistry Unit

PP-800, FBI Laboratory, Chemistry Unit

PP-500, FBI Laboratory, Chemistry Unit

PP-202, FBI Laboratory, Chemistry Unit

PP-203, FBI Laboratory, Chemistry Unit

8 REVISION HISTORY

Revision	Issued	Changes
03	09/15/2022	Reformatted to conform with LAB-100 requirements and to account for searches using a virtual database platform.