



B128 A Validation Study for Electrical Tape End Matches

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After attending this presentation, attendees will understand the design and results of a study to evaluate the validity of conducting tape end match examinations.

Few published studies exist to support admissibility challenges such as *Daubert* and *Frye* for fracture matches (physical matches). This study is the second in a series that will impact the forensic community and/or humanity by evaluating the validity of conducting end match examinations on different types of tapes submitted to forensic laboratories.

Tape end match examinations have been conducted in crime laboratories for decades; however, few publications exist to support admissibility challenges such as *Frye* and *Daubert*. The Chemistry Unit of the FBI Laboratory has embarked on a series of studies to address the validity of conducting end matches on different types of tapes submitted as evidence to crime laboratories. In 2004, the first phase of the FBI Laboratory's validation study, which addressed conducting end matches on duct tape, was presented at the American Academy of Forensic Sciences meeting in Dallas, TX. Phase two, a study that addresses conducting end matches of vinyl electrical tape, will be the subject of this presentation.

Poly(vinyl chloride) electrical tapes are often submitted to crime laboratories in association with an improvised explosive device (IED). The objective of the analysis is to establish a possible evidentiary link between a suspect and a crime or crimes. A logical first step is to attempt end matches of physically consistent pieces of tape. This study was designed to determine the validity of conducting end matches on vinyl electrical tapes and to evaluate the error rate associated with such an examination.

The study involved ten different test designs where the source roll of tape, mode of separation from the source roll, and/or test set preparer varied. Seven different rolls of vinyl electrical tape were used to prepare the sets. All were commercially-available at common retail stores, black in color, and nominally 3/4 inch wide. The rolls varied in price, product grade, and manufacturer. For the purpose of the study, the modes of separating the electrical tapes from the source rolls were tearing, nicking with a sharp implement and then tearing, or using a dispenser provided with the roll. Cut ends were not evaluated in this study. As an additional variable, two different people prepared the test sets.

A total of 30 test sets, three sets from each of the ten test designs, were prepared for administration to the three test participants. For each test set, ten (10) strips of tape were separated from the source roll as prescribed in the test set design and placed sequentially on a plastic sheet. After documenting the original sequential order of the tape strips, three or four of the pieces were removed at random from each of the test sets. The test sets administered to the test participants potentially contained one to six tape end matches.

The test participants were instructed to evaluate whether end matches existed among the strips of tape in each set. The results of the initial distribution of the test sets were evaluated by the test administrator. In cases where an end match was unidentified or misidentified, the test set was reevaluated independently by the other test participants and each rendered his or her opinion. During this reevaluation phase, the results of the initial administration of the test set were not revealed to the analysts conducting the reevaluation.

The results of this study will be presented in detail. Discussion will include the number of correctly identified tape end matches and whether variables such as product grade and mode of separation from the roll have an apparent effect on the ability to conduct these examinations.

End Match, Validation Study, Electrical Tape