



A144 The Evaluation of Chemical Interferences in Forensic Tape Analysis From FreeZ-It[®], Un-Du[®], and Super Glue[®] Fuming

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After attending this presentation, attendees will have a better understanding of the possible chemical interferences contributed from three techniques commonly used by latent print examiners in the beginning stages of latent print examinations on pressure-sensitive tapes.

This presentation will impact the forensic science community by clarifying potential chemical interferences that latent print processing techniques can have on the analysis of pressure-sensitive tapes. The collaboration between trace evidence examiners and latent print examiners in regard to handling the forensic examinations of these tapes is critical in promoting the development of probative information.

Pressure-sensitive tapes are commonly encountered in forensic science casework in the form of restraints, ligatures, blindfolds, mail fraud, and in improvised explosive devices. The potential exists, in cases involving pressure-sensitive tapes warranting both trace evidence examinations and latent print examinations, for one's examination to hinder or impede the other's examination(s). This potential "trade-off" is case specific and must result in close collaboration between examiners from each discipline and investigators and/or litigators. Is there a workflow that would allow for both disciplines to minimize the potential effects that each examination can have on the other? Does the processing conducted by the United States Army Criminal Investigation Laboratory's (USACIL) Latent Print Branch to protect any potential latent print(s) and DNA evidence hinder trace evidence chemical comparison examinations? Is it pertinent that trace evidence sample prior to any latent print processing or can latent prints take steps to preserve any potential latent prints (and DNA evidence associated with latent prints) up to the step of Super Glue fuming?

This research examined the possibility of minimizing the "trade-offs" that exist between trace evidence and latent prints in regard to the examination of pressure-sensitive tapes by determining if there are any chemical interferences observed in tape processed with FreeZ-It[®], Un-Du[®], and Super Glue fuming (cyanoacrylate) for three types of tape commonly encountered in casework (duct tape, vinyl/electrical tape, and clear packing tape). The processed tapes and neat samples were analyzed by Fourier Transform Infrared Spectroscopy (FTIR) and X-ray Fluorescence (XRF). All treated and neat samples were analyzed by Attenuated Total Reflectance (ATR). In addition to ATR, the duct tape samples were also evaluated by transmission FTIR (microscope) allowing for evaluation between the techniques. All treated and neat samples for the three different types of tapes were analyzed by XRF in triplicate. Statistics were applied to the XRF data to assist in determining if any significant differences occur in the spectral data.

There is evidence that suggests chemical interferences are present in tapes processed with super glue and analyzed by ATR. Also, there is evidence that supports significant differences in elemental data in duct tape adhesive and duct tape backing treated with FreeZ-It[®], Un-Du[®], and Super Glue when compared to the neat samples.

Trace Evidence, Latent Prints, Tape