



Young Forensic Scientists Forum—2020

Y4 Recovering Latent Fingerprints From Duct Tape After Removal From Various Surfaces Using Dry Ice

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Learning Overview: The goal of this presentation is to provide criminal insight on the most advantageous method for recovering latent fingerprints from duct tape.

Impact on the Forensic Science Community: This presentation will impact the forensic science community by providing latent print examiners an alternative method of removing duct tape and will assist in determining which latent fingerprint development method works best after applying the dry ice/acetone slush.

Duct tape is a common item of physical evidence found at many crime scenes. Duct tape has been used to facilitate different crimes, and the criminal population utilizes duct tape in a variety of ways. Some victims of violent crime are restrained or bound with duct tape, and duct tape is used to package items related to criminal activity. While there has been research in the area of preserving and recovering latent fingerprints from duct tape, very few studies have examined the use of dry ice for separation from various surfaces. The purpose of this study was to examine how dry ice reduces the adhesive properties of tape, specifically duct tape, and how the removal affects the quality of recovered latent fingerprints.

The researcher in this study examined the quality of recovered fingerprints separated from various surfaces using a dry ice/acetone slush. Initially, a series of preliminary experiments were conducted to observe how specific physical states of dry ice successfully separated tape from wood, metal, and glass. Dry ice was applied in blocks, crushed, powdered, and in an acetone slush. The following brands of duct tape used on each surface included Gorilla® Tape, 3M® Super Tough Duct Tape, 3M® All-Weather Duct Tape, Shurtape®, and 3M® Tough Duct Tape. All of the forenamed duct tapes were separated from wood, metal, and glass. A dry ice/acetone slush (-78.5°C) provided the most successful method for separation.

A latent print development method was used on each of the duct tapes after removal from the surfaces. The various developing methods that were used to recover latent fingerprints included cyanoacrylate fuming followed by Ardrox™ dye, ninhydrin, 1,8-Diaza-Fluorenone (DFO), Wetwop™, and crystal violet. The quality of recovered latent fingerprints was determined by using a grading system based on ridge detail and minutiae points. Preliminary results have shown that cyanoacrylate fuming followed by Ardrox™ dye, Wetwop™, and crystal violet yielded identifiable fingerprints. Additionally, it was observed that the texture of duct tape could interfere with the quality of developed prints, making the ridge detail difficult to see.

The final results of this study will assist latent print examiners by providing an alternative method of removing duct tape and will assist in determining which latent fingerprint development method works best after applying the dry ice/acetone slush.

Latent Fingerprints, Dry Ice/Acetone, Duct Tape