Technical Procedure for Cyanoacrylate Ester Fingerprint Development Kits

1.0 Purpose – This procedure is a non-porous development procedure.

2.0 Scope – This procedure is a step in the processing of non-porous evidence that may contain impressions that require developing/enhancing.

2.1 The Cyanoacrylate Ester Fingerprint Development Kit is a commercially prepared product that polymerizes the latent impression using cyanoacrylate. Numerous materials, including plastic bags, weapons, metals, and various other substrates, may be processed using the Cyanoacrylate Ester Fingerprint Development Kit. Cyanoacrylate shall be used as a preliminary process for subsequent processing techniques. Fluorescent dye staining, in conjunction with laser examinations, is dependent on the proper use of cyanoacrylate fuming techniques.

3.0 Definitions

- **Alternate light source:** Any of the multiple forensic light sources readily available in the Latent Evidence Section including, but not limited to, the CrimeScope (CS), Mini-CrimeScope (MCS), and TracER Laser.
- **Ambient light:** Light that is readily available in the office environment (i.e., natural light or light that emanates from an office lighting source).
- **CE:** Cyanoacrylate ester, also known as super glue.
- **Cyanoacrylate Ester Fingerprint Development Kit:** A commercially prepared cyanoacrylate ester fuming kit that assists in the processing of non-porous items of evidence with the assistance of cyanoacrylate ester. Commercial products currently used include Hot-Shot by Lynn Peavey and Cyano-Shot by Sirchie.

4.0 Equipment, Materials and Reagents

4.1 Equipment and Materials

- Cyanoacrylate Ester Fingerprint Development Kit

4.2 Reagents – N/A

5.0 Procedure

5.1 Hot-Shot (Lynn Peavey Product):

5.1.1 Items to be processed with the Hot-Shot shall first be examined visually in ambient lighting conditions and then with the use of an alternate light source (CS, MCS).

5.1.2 Remove the contents of the Hot-Shot and empty the activator packet into the base of the plastic containment vessel.

5.1.3 Make a hole in the bottom of the supplied canister and place (hole side down) in the containment vessel.

5.1.4 Open the cyanoacrylate ester container and empty into the top of the metal cap area of the canister.

5.1.5 Place vessel within the area to be fumed. Frequently check the item(s) of evidence to avoid over processing.

5.1.6 Allow the item and/or area processed to dry or set for an extended period of time prior to subsequent processing techniques.

5.1.7 Remove Hot-Shot and discard.

5.2 Cyano-Shot (Sirchie Product):

5.2.1 Items to be processed with the Cyano-Shot must first be examined visually in ambient lighting conditions and then with the use of an alternate light source (CS, MCS).

5.2.2 Remove the contents of the Cyano-Shot and empty the activator packet into the base of the plastic containment vessel.

5.2.3 Place the Cyano-Shot activator canister (hole side down) into the vessel containing the activator solution. Remove plastic covering hole prior to placing within vessel.

5.2.4 Open the cyanoacrylate ester container and empty into the top of the metal cap area of the canister.

5.2.5 Frequently check the item(s) of evidence to avoid over processing.

5.2.6 Allow the item(s) and/or area to dry or set for an extended period of time prior to subsequent processing techniques.

5.2.7 Remove Cyano-Shot and discard.

5.3 Standards and Controls – Forensic Scientists shall produce a self-made test print to be processed concurrently with items of evidence.

5.4 Calibration – N/A

5.5 Sampling – N/A

5.6 Calculations – N/A

5.7 Uncertainty of Measurement - N/A

6.0 Limitations – Cyanoacrylate Ester Fingerprint Development Kit is for use in the processing of non-porous evidence.

6.1 The cyanoacrylate ester tubes provided in some commercially prepared kits may harden over time. Other approved cyanoacrylate ester products and procedures used for developing latent prints may be substituted.

6.2 The cyanoacrylate fuming process is vital to any subsequent treatment with fluorescent dyes and laser and/or alternate light source examinations (see Fluorescent Dyes and Laser/Alternate Light Sources).

7.0 Safety – Proper ventilation of work area is required as the fumes may cause irritation when in contact with the eyes or skin and may be harmful if inhaled or ingested. Protective goggles, gloves, and apron/lab coat shall be worn during processing. Additionally, cyanoacrylate ester is an adhesive/glue; care shall be taken to avoid application to unintended surfaces.

7.1 This process may be used in larger open areas. Extreme care must be taken when conducting this procedure. When a large area (e.g., interior of a vehicle, etc.) is processed, ensure that the area is tightly secured. Once the fuming of the area is complete, open all windows and/or doors and let the area completely air out before proceeding.

8.0 References

Bessman, C.W., et al. "A Comparison of Cyanoacrylate Fuming in a Vacuum Cabinet to a Humidity Fuming Chamber." *Journal of Forensic Identification*. Vol. 55, 1: 10 – 35 (2005).

Cummings, H., M. Hollars and T. Trozzi. "Getting the Most from Cyanoacrylate Dyes." *Journal of Forensic Identification.* Vol. 43, 1: 37-43 (1993).

Day, K.J. and W. Bowker. "Enhancement of Cyanoacrylate Developed Latent Prints Using Nile Red." *Journal of Forensic Identification.* Vol. 46, 2: 183-187 (1996).

Deobald, G.W. "The Effect of Cyanoacrylate Fuming on Firearms Examinations." *Identification Canada.* (1992): 4-13.

Fallano, J.F. "Alternatives to Alternate Light Sources: How to Achieve a Greater Print Yield with Cyanoacrylate Fuming." *Journal of Forensic Identification.* Vol. 42, 2: 91-95 (1992).

Fertgus, R.E. "Latent Print Destruction and Superglue Stabilization." *Florida Division of the International Association for Identification.* (1993): 7.

Kendall, F.G. and B.W. Rehn. "Rapid Method of Super Glue Fuming for the Development of Latent Fingerprints." *Identification News.* (June 1982): 3-4.

Kendall, F.G. "Superglue Fuming for the Development of Latent Fingerprints." *Identification News.* (May 1982): 3-5.

King, W.R. "The Effects of Differential Cyanoacrylate Fuming Times on the Development of Fingerprints on Skin." *Journal of Forensic Identification.* Vol. 59, 5: 537 – 544 (2009).

Kobus, H.J., R.N. Warrener and M. Stoilovic. "Two Simple Staining Procedures Which Improve the Contrast and Ridge Detail of Fingerprints Developed with "Super Glue" (Cyanoacrylate Ester)." *Forensic Science International.* Vol. 23: 233-240 (1983).

Mazzella, W.D. and C.J. Lennard. "An Additional Study of Cyanoacrylate Stains." *Journal of Forensic Identification.* Vol. 45, 1: 5-18 (1995).

Mock, J.P. "Cyanoacrylates and Heat – A Word of Caution." *The Identification Section.* Vol. 3, 3 (June 1985).

Sahs, P.T. and R.J. Wojcik. "Moisture Catalyst for Cyanoacrylate Fuming." *Identification News.* (September 1984): 9.

Weaver, D.E, and E.J. Clary. *A One Step Fluorescent Cyanoacrylate Fingerprint Development Technology.* State of Alaska Scientific Crime Detection Laboratory Research Team.

9.0 Records – N/A

10.0 Attachments – N/A

Revision History		
Effective Date	Version Number	Reason
09/17/2012	1	Original Document
10/31/2013	2	Added issuing authority to header
03/30/2017	3	Header Update – Removed Digital reference.
01/19/2018	4	Updated issuing authority in header 5.0 & 5.2 - Moved requirement for test print to "Standards and Controls."
02/01/2019	5	3.0: Added abbreviation for CrimeScope, and Mini-CrimeScope; removed UltraLite ALS