

---

## Technical Procedure for the use of the Cyanovac

**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 cyanovac polymerizes the latent impression using cyanoacrylate in a vacuum environment. The vacuum will eliminate background moisture and allow the cyanoacrylate to attach to the components of the latent impression thereby eliminating the over-fuming that may occur with manual cyanoacrylate techniques. Numerous materials, including plastic bags, weapons, metals, and various other substrates, may be processed using the Cyanovac. Cyanoacrylate shall be used as a preliminary process when utilizing 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 Digital/Latent Evidence Section including, but not limited to, the Crime Scope, Mini-Crime Scope, TracER Laser, and Ultra-Lite ALS.
- **Ambient light:** Light that is readily available in the office environment (i.e., natural light or light that emanates from an office lighting source).
- **Short tube:** Any of the Cyanovacs located in the Digital/Latent Evidence Section that are upright in nature and designated for use with shorter items of evidence.
- **Long tube:** Any of the Cyanovacs located in the Digital/Latent Evidence Section that are horizontal in nature and designed for use with longer items of evidence.
- **CE:** Cyanoacrylate ester, also known as super glue.
- **Cyanovac:** Any of the multiple Cyanovac units (long or short tube) that assist in the processing of nonporous items of evidence with cyanoacrylate ester in a vacuum environment.

### 4.0 Equipment, Materials and Reagents

#### 4.1 Equipment and Materials

- Cyanovac (short or long tube)

#### 4.2 Reagents

- Cyanoacrylate ester (Bottle/Vial)

### 5.0 Procedure

**5.1** Forensic Scientist shall produce a self-made test print to be processed concurrently with items of evidence (See Section Technical Procedure for Ensuring Quality Control.)

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

**5.3** Remove the end cap from the Cyanovac chamber by releasing the elastic T-straps.

**5.4** Insert item(s) of evidence into chamber by hand.

**Note:** Items may touch each other and the sides of the vessel without significant effect on processing. Large flexible items such as garbage bags must be unfolded to the degree possible, but need not be fully spread. Sealed items, such as zip top plastic bags or sealed plastic or metal containers must be opened in order to prevent rupture due to vacuum environment.

**5.5** Place five (5) to ten (10) drops of cyanoacrylate (super glue) in a foil dish and place into chamber.

**5.6** Verify that the o-ring is present in the end cap. Ensure that it is not broken or dry-rotted.

**5.7** Replace end cap on the chamber and fasten using elastic T-straps.

**5.8** Verify that the chamber bleed valve is closed.

**5.9** Turn the vacuum pump to ON using the switch.

**5.10** Observe the vacuum gauge to ensure that the air in the chamber is being evacuated. Pump will automatically stop at the appropriate pressure set by the manufacturer.

**Note:** Pump will automatically restart if the vacuum pressure varies from optimum.

**5.11** Allow the item(s) to remain under vacuum for twenty (20) minutes.

**Note:** Some items may require a longer processing time; however, this period of time will not compromise the test value.

**5.12** Turn vacuum pump to OFF using the switch.

**5.13** Open the chamber bleed valve to equalize pressure.

**5.14** Remove chamber end cap and remove cyanoacrylate source.

**5.15** Leave item(s) in the chamber for approximately ten (10) minutes.

**5.16** Remove item(s) and allow to rest for twenty-four (24) hours.

**Note:** The additional twenty-four (24) hour rest allows for full setting of cyanoacrylate.

**5.17** Examine item(s) for developed latent prints using subsequent processing techniques.

**5.18** Any developed latent prints must then be preserved using the method described in the Steps for Preserving Developed Impressions.

### **5.19 Standards and Controls – N/A**

**5.20 Calibration** – See Cyanovac operating manual for further information on controls and specifications.

**5.21 Sampling** – N/A

**5.22 Calculations** – N/A

**5.23 Uncertainty of Measurement** - N/A

**6.0 Limitations** – Cyanovac is for use in the processing of non-porous evidence.

**6.1** The cyanoacrylate fuming process is vital to 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 purging of the system is necessary 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.

## **8.0 References**

Besonen, J.A. “Heat Acceleration of the Superglue Fuming Method for Development of Latent Fingerprints.” *Identification News*. (1983): 3 – 4.

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.

Froude Jr., J.H. “The Super Glue Fuming Wand: A Preliminary Evaluation.” *Journal of Forensic Identification*. Vol. 46, 1: 19-31 (1996).

Howorka, H., and K. Kretschmer. “Experimental Study of Using Cyanoacrylate Ester Vapor for Developing Latent Fingerprints.” *Forensic Science International*. Vol. 46: 31-32 (1990).

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.

Kent, T., ed. *Manual of Fingerprint Development Techniques: A Guide to the Selection and Use of Processing for the Development of Latent Fingerprints*. Police Scientific Development Branch, London (July 1992).

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. Warren, 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).

Lee, H.C. "Methods of Latent Print Development." *Proceedings of the International Forensic Symposium on Latent Prints*. (July 1987): 15 – 24.

Lennard, C.J. and P.A. Margot. "Sequencing of Reagents for the Improved Visualization of Latent Fingerprints." *Proceedings of the International Forensic Symposium on Latent Prints*. (July 1987): 141-142.

Llewellyn Jr., P.E. and L.S. Dinkins. "A New Use for an Old Friend." *Journal of Forensic Identification*. Vol. 45, 5: 498-503 (1995).

*Manual of Fingerprint Development Techniques: A Guide to the Selection and Use of Processes for the Development of Latent Fingerprints*. Scientific Research and Development Branch, London (1986).

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

Menzel, E. R., et al. "Laser Detection of Latent Fingerprints: Treatment with Glue Containing Cyanoacrylate Ester." *Journal of Forensic Sciences*. Vol. 28, 2: 307-317 (April 1983).

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

Olsen, R., and M.F. Shonberger. "A Slow-Reacting Catalyst for Cyanoacrylate Fuming." *Journal of Forensic Identification*. Vol. 45, 6: 651-653 (1995).

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

US Department of Justice. *Chemical Formulas and Processing Guide for Developing Latent Prints*. FBI Laboratory Division, Latent Fingerprint Section (1994).

Watkin, J.E., et al. "Cyanoacrylate Fuming of Latent Prints: Vacuum Versus Heat/Humidity." *Journal of Forensic Identification*. Vol. 44, 5: 545-556 (1994).

Weaver, D.E., and E. J. Clary. *A One Step Fluorescent Cyanoacrylate Fingerprint Development Technology*. State of Alaska Scientific Crime Detection Laboratory Research Team. 1-12.

Wilkinson, D.A., and A.H. Misner. "A Comparison of Thenoyl Europium Chelate with Ardrex and Rhodamine 6G for the Fluorescent Detection of Cyanoacrylate Prints." *Journal of Forensic Identification*. Vol. 44, 4: 387-406 (1994).

**9.0 Records – N/A**

**10.0 Attachments – N/A**

<b>Revision History</b>		
Effective Date	Version Number	Reason
09/17/2012	1	Original Document
10/31/2013	2	Added issuing authority to header