



<b>ATF-LS-LP10</b> <b>Cyanoacrylate Ester Fuming</b>	Published Online: <b>March 2018</b>
Authority: Technical Leader	
Unofficial Copy; May Not Be Most Current Version	Page: 1 of 2

I. **Scope:** Cyanoacrylate vapor, ethyl or methyl cyanoacrylate, polymerizes with some latent print impressions to produce a white residue. The contrast of developed fingerprints may sometime be improved by the application of fluorescent dyes and/or powders.

II. **References:**

Lee, Henry C.; R.E. Gaensslen. "Cyanoacrylate Fuming"; *Identification News*, 1984, 34, 3, 8-14.

Lee, Henry C.; Gaensslen, R.E., eds. *Advances in Fingerprint Technology*; Elsevier Science Publishers, NY, 1991.

Lennard, Christopher J.; Pierre A. Margot. "Sequencing of Reagents for the Improved Visualization of Latent Fingerprints"; *Journal of Forensic Identification*, September/October 1988, 38, 5, 197-210.

Kent, Terry, ed. *Fingerprint Development Techniques*; Heanor Gate Publisher: Derbyshire, England, 1993.

Pounds, C.A.; R.J. Jones, "Physicochemical Techniques in the Development of Latent Fingerprints"; *Trends in Analytical Chemistry*, 1983, 2, 8, 180-183.

III. **Apparatus/Reagents:**

- Cyanoacrylate Fuming Chamber
- Cyanoacrylate Ester (superglue)
- MSDS Safety Sheet

IV. **Safety Precautions:** This procedure involves the use of hazardous materials. This procedure does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this procedure to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. Proper caution should be exercised and the use of personal protective equipment should be utilized to avoid exposure to dangerous chemicals. Consult the appropriate MSDS for each chemical prior to use.

V. **Procedures:** Volatilization of cyanoacrylate ester at normal room temperature is relatively slow but is a viable procedure for evidence processing. Vapors must be contained, and a tank or plastic enclosure is most often used. A ratio of two drops of adhesive for every gallon of capacity or volume with relatively high humidity is usually effective. Polymerization may be retarded or prevented by low humidity. The addition of a cup of luke warm water usually will improve the fuming results. Development time will vary with the temperature, humidity and the substrate being processed. Development of fuming cabinets which control the heat and humidity of the chamber have shown good results and can be used to more precisely control the fuming process.

Application of heat greatly accelerates volatilization. Metal blocks or a hot plate can serve as the heat source but caution must be used not to over heat to the point where cyanide vapors can be produced. An aluminum dish or shaped foil is placed on the hot surface and the adhesive poured onto the aluminum. A cup of warm water is placed in the enclosure. Volatilization can be very rapid and development may be accomplished in as little as 10 minutes. Care must be taken to closely observe the process to insure that the item is not overdeveloped.

An alternative which offers rapid development time with minimum health risk, is to use a light bulb as the heat source. A standard light receptacle is added to the processing tank with a wire loop support fashioned to hold a watch glass approximately 1-inch above the light bulb. The adhesive is dropped onto the watch glass. A cup of warm water is placed in the enclosure. Once the container is covered tightly, the light is turned on. Rapid volatilization does not begin until the heat from the bulb penetrates the watch glass. Natural convection currents aid dispersal of the fumes and development is generally accomplished in about 15 minutes.

Photographic preservation of all suitable polymerized impressions is recommended prior to any additional processing. Once the latent impressions are recorded, further processing sometimes reveals impressions in which polymerization was too indistinct for visual notice or did not occur. Powders and particulate developers are effective and often permit additional photographic and lifting preservation. Small particle reagent will sometimes adhere to faint impressions when powders will not. Laser dye and/or Ardrex P133D application is generally effective after powder, particulate, or SPR application as the liquid dye solution will normally wash away the particulate remnants. However, vinyl, rubber, oily guns, and hard plastics, especially those used in cash register drawers, may not be receptive to any powder or particulate method.

- VI. Quality Assurance/Quality Control:** For each new application of the Cyanoacrylate Ester Fuming, an oily/sweat impression should be placed on a clean microscope slide or other appropriate medium, and exposed to the Cyanoacrylate fumes during the processing phase of the evidence. If the test impression is visualized after processing, indicated by white/grayish colored ridges, the Cyanoacrylate Ester Fuming technique is working properly. The test strip may be discarded.

Polymerization may be retarded or prevented by low humidity. This processing method can interfere with forensic examinations for handwriting, ink, paper and indented impressions, body fluids, fibers and paint.