Technical Procedure for Rhodamine 6G

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 One of the most effective ways to recover latent prints from items of evidence is to use a fluorescent dye followed by a laser or alternate light source examination. Rhodamine 6G is one the most effective laser dyes in recovering latent prints on various non-porous surfaces. This dye is normally used on non-porous surfaces, but may, under certain conditions, be used on porous or semi-porous surfaces. Rhodamine 6G is extremely efficient as it is highly fluorescent and can be used with various alternate light sources.

3.0 Definitions

- **Alternate light source (ALS)** - Any of the multiple forensic light sources readily available in the Latent Evidence Section including, but not limited to, the CrimeScope, Mini-CrimeScope, TracER Laser, and Ultra-Lite ALS.
- **CE** - Cyanoacrylate ester (also known as super glue)
- **R6G** - Rhodamine 6G

4.0 Equipment, Materials and Reagents

4.1 Equipment and Materials

- Orange filter (goggles and/or camera lens filter)
- Alternate light source
- Fume hood
- Gloves
- Face shield and/or safety goggles
- Plastic applicator bottles or tray for submersion

4.2 Reagents

- Rhodamine 6G (powder)
- Methanol

5.0 Procedure

5.1 Mixing Procedure

5.1.1 Place approximately 0.005 gram of Rhodamine 6G (powder) in 500 mL of methanol. (Dampen the tip of an unfolded paperclip with methanol and insert it into the chemical bottle. The powder that adheres to the paperclip can then be transferred into the methanol.)

5.1.2 Thoroughly dissolve the R6G powder in the methanol. Solution is ready for use.

5.2 Application Procedure

5.2.1 First apply cyanoacrylate ester to the item of evidence. R6G adheres to the chlorosis (white/grey buildup) that occurs after processing with CE.

5.2.2 Non-porous items: Using the fume hood and gloves, spray or completely submerge the item of evidence in the methanol/R6G solution. Allow to dry.

5.2.3 When completely dry, view the item using the CrimeScope, Mini-CrimeScope or TracER Laser. Use goggles to view any fluorescence. Latent prints will fluoresce bright yellow.

Note: R6G will preferentially adhere to super glued prints, but a certain amount may adhere to the item surface. If too much dye is used, the entire surface will fluoresce and mask the latent print. In this case, rinsing the item with methanol will cause the excess dye to wash away and, in most cases, the dye adhering to the latent print will remain.

5.2.4 Porous/semi-porous items: Follow the above directions for R6G preparation as in 5.1, substituting purified water for the methanol.

5.2.5 Once the item has been sprayed or submerged, it should be rinsed with clear water immediately and scanned with an ALS or Laser.

Note: Porous/semi-porous items shall be super glued prior to treatment; however, these items pose a problem when using R6G as a solution stain. The dye penetrates the pores of the item, causing overall fluorescence. The latent prints will be masked in this instance and rinsing the excess dye is difficult. The best way to solution stain porous/semi-porous items is to use the water based R6G solution.

5.2.6 Any latent prints shall be preserved using photography. Camera shall be equipped with an orange filter for print visualization.

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 Uncertai**nty of Measurement -**N/A

6.0 Limitations – Rhodamine 6G is for use in the processing of non-porous evidence. Some porous/semi-porous items may be processed using this technique.

6.1 The cyanoacrylate fuming process is vital to the success of Rhodamine 6G processing.

6.2 Rhodamine 6G powder has an indefinite shelf life; however, once prepared it has a shelf life of 6 months.

6.3 All prepared solution shall be stored in dark, shatter-proof bottles. Working solution may be stored in clear spray bottles.

6.4 Rhodamine 6G powder shall be stored in the original shipping container.

7.0 Safety – The safety concerns regarding Rhodamine 6G have not been thoroughly investigated and there are varied opinions on the associated health effects of this chemical. The chemical solution shall be applied and treated with extreme care until the full effects are known. It may cause irritation when in contact with the eyes or skin and may be harmful if inhaled or ingested. The methanol used in this solution is flammable and shall be handled with extreme care.

8.0 References

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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 5.2.1 & 5.3 - Moved requirement for test print to "Standards and Controls."
02/01/2019	5	3.0: lowercase "light source"; add abbreviation for ALS 5.1.1: added "approximately" 5.2.1: added description of "chlorosis" 5.2.4: changed distilled to purified 6.2: used numeral instead of spelling out number