Deviation Request Form (DRF)

Directions: The Initiator will complete Sections A through C. Additional continuation pages can be included if necessary.

Initiator	Adrianne Reeve	**Date**	3/4/2021

A. Requested deviation applies to (Technical Procedure – include specific section):

Technical Procedure for Ninhydrin HFE-7100

B. Requested deviation:

Add "Heat/" to Humidity Chamber-Change humidity chamber to heat/humidity chamber
Change (See Technical Procedures for porous processing reagents for guidelines for the use of a humidity chamber) to (See Instructions for Use of the Heat/Humidity Chamber).

C. Necessity for the deviation:

To have a reference on how to use this piece of equipment.

D. Technical review and Authorization (to be completed by the Quality Manager and/or Technical Leader)
Comments(to include merits and impacts):

This is an extension of the DRF that originally authorized on March 6, 2020.

Approved	☑	Yes	☐	No	Duration	One year
Signature	Adrianne Reeve Digitally signed by Adrianne Reeve DN: CN=Adrianne Reeve, O=North Carolina State Crime Laboratory, E=areeve@ncdoj.gov, C=US Reason: I am the author of this document Location: your signing location here Date: 2021-03-04 13:55:47 Foxit PhantomPDF Version: 10.0.0				Date	3/4/2021

E. Quality Assurance Authorization (to be completed by the Quality Manager, Forensic Scientist Manager or designee)

Acceptable within general QA guidelines and good laboratory practice?	☑	Yes	☐	No
Significant negative impact to Crime Laboratory Quality System?	☐	Yes	☑	No

Restrictions/limitations:

☑	Authorized	☐	Rejected	Signature	Karen W. Morrow Digitally signed by Karen W. Morrow Date: 2021.03.04 15:08:43 -05'00'	Date	3.4.2021

Technical Procedure for Ninhydrin HFE-7100

1.0 Purpose - This procedure describes how to make the Ninhydrin HFE-7100 solution and apply it to items of evidence.

2.0 Scope - This procedure applies to porous items of evidence that are to be examined for the presence of latent prints. Ninhydrin reacts to the amino acids present in fingerprint residue and turns the amino acids purple when the reaction is complete.

3.0 Definitions – N/A

4.0 Equipment, Materials and Reagents

4.1 Equipment and Materials

- Laboratory coat and gloves
- Face shield visor and/or safety goggles
- Magnetic stir bar and magnetic retriever
- Glass beakers
- Graduated cylinders
- Dark, shatter-proof container
- Forceps
- Fume hood
- Glass tray, paint brush, or aerosol sprayer (for application)
- Camera/scanner
- Dust or mist respirator (for application outside of fume hood)
- Humidity equipment

4.2 Reagents

- Ninhydrin crystals
- Ethanol (ethyl alcohol)
- Ethyl acetate
- Glacial acetic acid
- HFE-7100

5.0 Procedure

5.1 Chemical Preparation

5.1.1 Concentrate Solution

5.1.1.1 Place 25 grams of ninhydrin crystals and a magnetic stir bar into a 500 mL beaker.

5.1.1.2 Add 225 mL of ethanol to the beaker and stir until the ninhydrin crystals have completely dissolved. Do not use heat.

5.1.1.3 Add 10 mL of ethyl acetate while stirring.

5.1.1.4 Add 25 mL of glacial acetic acid to the mixture. Continue stirring until clear yellow solution is produced.

5.1.1.5 Transfer the concentrate solution to a clean, dark, shatter-proof container.

5.1.2 Working Solution

5.1.2.1 Measure 52 mL of the concentrate solution and place in a 2 L glass beaker with a magnetic stir bar.

5.1.2.2 Measure 1000 mL of HFE-7100 and add to the concentrate solution while stirring.

5.1.2.3 Transfer the resulting working solution to a clean, dark, shatter-proof container.

5.2 Processing Procedures

5.2.1 Chemical Application

5.2.1.1 Dipping Method –Completely submerge the item in the working solution for 5-10 seconds.

5.2.1.2 Brush Method – Dip the brush into the working solution and brush directly onto the item.

5.2.1.3 Spray Method – Spray the item with the working solution to completely saturate the item.

5.2.1.4 Allow the item to dry completely prior to proceeding.

5.2.2 Latent impressions will develop over time at room temperature. Several methods are available to enhance the development process.

5.2.2.1 Plastic Bag – Place the item in a sealed plastic bag until latent impressions develop.

5.2.2.2 Steam Iron – The iron is used to provide heat and moisture to the item. Hold the iron above the item and steam it, taking care to avoid contact between the item and the iron.

5.2.2.3 Microwave – Heat a tray or beaker of water in the microwave to produce steam. Place the item in the microwave for approximately 5 minutes, or until impressions develop. Do not turn on the microwave with the evidence inside and do not allow the evidence to contact the hot water bath.

5.2.2.4 Humidity Chamber –Items may be placed in a humidity chamber to assist in latent print development (See Technical Procedures for porous processing reagents for guidelines for the use of a humidity chamber). .

5.2.3 Preservation of Developed Impressions – Preserve the developed impressions through photography (see photographic equipment procedures) and/or by electronic recording (see Section Image Processing Procedure).

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

6.1 The ninhydrin crystals shall be stored in the original shipping container until needed.

6.2 Ninhydrin solutions shall be stored in dark, shatter-proof containers at all times to avoid direct exposure to sunlight.

6.3 Shelf Life

6.3.1 Ninhydrin crystals – indefinite.

6.3.2 Concentrate and working solution - 1 year.

7.0 Safety

7.1 The process shall be performed in a fume hood as the fumes may cause some irritation when in contact with the eyes or skin and may be harmful if inhaled or ingested.

7.2 Protective goggles, gloves and lab coats shall be worn during processing as the solution will stain skin and clothing.

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 5.2.11 & 5.3 - Moved requirement for test print to "Standards and Controls." 5.2.4 – Added technical procedure reference for the use of a humidity chamber.
02/01/2019	5	Changed number references to be numerals only instead of spelled out throughout document 4.2: removed chemical amounts 5.2.2.4: corrected spelling