

I. Where fingerprints come from



Level 1

A. The overall general flow or pattern (Level 1 detail) of friction ridges on human hands and feet is governed primarily by the height and position of the Volar pads formed before birth. The formation of the Volar pads is affected by inherited traits from the parents. High pads will form whorls, low pads arches, a medium height pad to one side a loop, etc. Thus twins or close relatives may have very similar ridge flow patterns (also called finger or palm print classification).

Level 2



Level 3



II. Lab Technician responsibility.

- A. Locate fingerprints.
- B. Develop the prints.
 - 1. location of processing.
 - a. at the scene.
 - b. transported to lab or other controlled environment.
 - 2. type of surface will dictate means of processing.
 - a. portable vs. non-portable items.
 - b. item to be processed for further evidence.
- C. Preserving the evidence.

1. photography.
 2. lifts.
- III. Latent prints.
- A. Perspiration.
 1. secretions from pores at or near the summits of the ridges on friction ridge skin.
 2. 98 - 99.5% water.
 3. 1/2 - 1-1/2% other substances.
 - a. amino acids.
 - b. sodium chloride.
 - B. Contaminants.
 1. oils.
 2. grease.
 3. transferable substances.
 - C. Non-living epidermal cells.
- III. Factors in leaving latent prints.
- A. Positive factors.
 1. ridges must bear transferable substances.
 2. heat / humidity.
 3. careless handling.
 - B. Negative factors.
 1. ridges clean and dry.
 2. cold weather.
 3. careful handling.
- IV. Patent prints. (visible.)
- A. Blood.
 - B. Grease.
 - C. Paint.
- V. Impressed prints.
- A. Putty.
 - B. Heated synthetics.
- VI. Etched prints.
- A. Copper.
 - B. Other metals.
- VII. Factors in recovering fingerprints.
- C. Proficiency of the examiner.
 1. training.
 2. attitude.
 3. technical materials.
 4. the utilization of other labs / experts.
 - C. Condition of the specimen.
 1. exposure to the elements.
 - a. moisture.
 - b. heat.
 - c. wind.
 2. time lapse since the specimen was handled.

- a. expedite processing.
- b. no technical method for determining the age of a fingerprint.

VIII. Identification of fingerprints: technical basis.

- D. Fingerprints are permanent.
- E. Fingerprints are unique.
- F. No specific number of ridge characteristics are required.
- G. Identification testimony given with as few as seven points.
- H. An area of as little as 1/4" square may hold enough points for an identification.

IX. Developing latent prints: types of surfaces.

A. Non-porous.

- 1. glass.
- 2. polished metal.
- 3. means of locating the prints.
 - a. visual.
 - b. Alternate Light Source (A.L.S.)
 - c. cyanoacrylate.
 - d. ardrox.
 - e. A.L.S.
 - f. powders.
 - 1. conventional.
 - 2. fluorescent.
 - e. A.L.S.
 - e. photography.
 - f. lifts.

B. Porous.

- 1. paper.
- 2. cardboard.
- 3. unfinished wood.
- 4. means of locating the prints.
 - a. iodine.
 - b. ninhydrin.
 - c. A.L.S.
 - d. zinc chloride / rhodamine.
 - e. A.L.S.
 - f. physical developer.

X. Development of prints by iodine fuming.

- A. Develops grease and oil prints on porous items.
- B. Iodine gun.
- C. Cabinet method.
- D. Shake and bake.
- E. Grease and oils absorb the iodine - latents are stained.

F. Benzoflavone on the prints add permanency.

XI. Development of prints by ninhydrin.

1. .6% solution. 6 grams ninhydrin mixed with 1 liter acetone.
2. Chemical reaction with amino acids.
3. Spray.
4. Dip.
5. Air dry (not forced) with humidity if possible.

XII. (wetted towel inside paper sack - micro waved.)

2. Luminescence of ninhydrin prints.

A. Zinc chloride.

1. 10 grams zinc chloride mixed with one liter acetone.
2. best when sprayed on the surface.

B. Rhodamine.

1. 10 grams rhodamine mixed with 300 ml. acetone.
2. poured over surface.
3. followed by washing the surface with acetone.

3. Physical Developer.

A. Development of latents on porous surface after ninhydrin.

1. 5 ml. solution A (20% silver nitrate solution) to 90 ml. solution B (reductant solution.)
2. stir working solution one minute.
3. pour into clean glass tray.
4. specimen into solution no longer than 5 minutes.
5. rinse specimen thoroughly until background PD stains are all or nearly gone.
6. optional %50 bleach tap water rinse.
7. dry completely.