

Approved by Director: Dr. Guy Vallaro

Title: SEM sample collection on clothing for gunshot residue (GSR) analysis

A. Purpose: To collect samples for the presence of gunshot residue (GSR)

B. Responsibility: GSR analyst or designee

C. Procedure:

1. Preparation: All evidence is handled in accordance with GL-13: general evidence handling
 - a. Clothing evidence is checked out of the Evidence Control Unit with appropriate bar code label.
 - b. Clothing evidence is stored in the examiner's evidence locker or chemistry section evidence closet until the analysis can be conducted.
 - c. Upon starting examination, document all label information on an appropriate worksheet(see attached) and check the integrity of the seal on the outside of the package.
2. If there is a presence of a bullet-type hole, microscopically examine the periphery of the hole for a presence of gunpowder-like particles:
 - a. If there are gun powder-like particles present, take a photograph. Remove the particle(s) using a fine forceps from the clothing onto a glass slide, if the particle(s) dissolve in acetone and react positive with diphenylamine (DPA) reagent, the presence of gunpowder-like particle is determined.
 - b. If there is an absence of particles, use a blank SEM disc to sample the periphery area of the hole (see the following SEM sample collection).
3. Drawing a sketch on the worksheet or using pre-drawn diagram attached to the work sheet (see attached) for the evidence you are examining, Mark the areas where the SEM samples are taken.
4. General SEM sample collection using adhesive covered SEM stubs

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- a. Long pants: take SEM samples from the outside/inside areas of all outside pockets, respectively.
 - b. Long sleeve shirt/jacket: take SEM samples from the areas of sleeve cuffs and all outside pockets, respectively.
 - c. Short sleeve shirt/T-shirt: take SEM samples from the front area.
 - d. Shoes and hat: take SEM samples from the areas of the outside surfaces of these items.
 - e. Inside shirts/underwear: No SEM samples are collected unless a special request is made by the submitting agency.
5. Re-pack and seal evidence for return to the submitting agency or transferring to different unit(s) for further analysis if there is an additional examination request.

D. Equipment list

1. Scanning electron Microscope with energy dispersive X-ray spectrometry detection (SEM/EDS)
 - a. Hitachi S-3700N
 - b. EDAX Genesis system
2. Carbon coater(when necessary)
Denton vacuum DV-502

E. References

SOPGL013