



Physical Evidence Bulletin

Gunshot Residue (GSR) Collection

Purpose

The Physical Evidence Bulletin (PEB) is a guideline intended for law enforcement agencies to follow in order properly sample, preserve, and to submit gunshot residue evidence to BFS Laboratories. Physical Evidence bulletins are not intended to be used in lieu of training in the collection of evidence.

This PEB pertains to sampling and examination for the presence of GSR. For guidelines pertaining to distance determination, please refer to PEB 12 (Firearms Examination).

Introduction

The Bureau of Forensic Services (BFS) provides analytical support to law enforcement agencies through the examination for gunshot residue. Gunshot residue (GSR) results from the discharge of a firearm. The residue escapes through openings in the weapon and the end of a barrel and is deposited on nearby surfaces. The amount of residue detected varies with the type of weapon, ammunition, conditions of discharge, and post-shooting activity. **GSR analysis does not determine whether or not an individual has discharged a firearm.**

The presence of gunshot residue may occur for the following reasons:

- The individual may have discharged a firearm.
- The surface/individual may have been in the vicinity of a firearm when it was discharged.
- The surface/individual may have been in contact with a firearm or ammunition.
- The surface/individual may have been in contact with an object or individual bearing gunshot residue.

The absence of gunshot residue may occur for the following reasons:

- The surface/individual was not in the vicinity of a firearm when it was discharged.
 - The surface/individual was in the vicinity of a firearm when it was discharged, but no GSR particles were deposited on the sampled area.
 - GSR particles were removed by washing, wiping, or other activity before the samples were collected.
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Sample collection

Some GSR collection kits contain swabs. Please do not use the swabs. BFS is unable to examine swabs and using them before sampling with adhesive discs may remove GSR particles if they are present.

In order to ensure proper GSR evidence collection, BFS recommends the following:

- **Hand samples should be collected immediately after contact with the subject in the field.** To minimize the risk of contamination and/or loss of potential GSR, sample before handcuffing, transporting, or fingerprinting whenever possible.
- **Samples should be collected by an individual who has not recently handled a firearm.** At minimum, the individual collecting GSR samples should wash their hands prior to collecting the samples and wear the gloves provided in the GSR kit.
- **Follow the instructions provided in the GSR kit.** Each tube should be properly labelled to identify the collection surface. A dabbing motion should be used to collect the sample – do not rub or slide the adhesive across the surface.

Submission criteria

All GSR cases must receive BFS approval before submission to the laboratory. GSR examinations will only be conducted in cases where probative information may be obtained. Contact your local BFS laboratory to discuss your case prior to submitting any evidence.

BFS does not examine the following sample types:

- **Hand samples collected more than 6 hours after the shooting incident.** GSR is readily shed from the hands during even minor physical activity. The likelihood of finding GSR after a time lapse greater than 4-6 hours is remote. Sampling for GSR should be performed as soon as possible after the shooting.
- **Samples from a subject who was found in the possession of, or is known to have recently handled, a firearm.** This analysis cannot distinguish between discharging or handling a firearm.
- **Samples from a subject who has washed his/her hands or bathed since the shooting incident.** Washing the hands is likely to remove all GSR.
- **Samples from subjects with gunshot wounds or surfaces with bullet impacts.** If an individual (or object) has been shot, then they are known to have been in an environment of GSR. The absence of GSR also does not rule out the possibility that the individual handled or discharged a firearm. Additionally, GSR analysis cannot determine whether a victim's death was the result of a homicide or a suicide.

BFS may examine the following sample types:

- **Hand samples** (see above for acceptance criteria).
 - **Clothing or GSR samples from clothing may be accepted if hand samples are not available and there is a reasonable expectation that the clothing was worn during the shooting incident and has not been laundered.**
 - Shirts, sweatshirts, and jackets are preferred. The outermost article of clothing worn during the incident should be sampled or submitted. Other items of clothing may be accepted depending on the circumstances.
 - Samples of the cuffs/sleeves and front of the garment are preferred.
 - Each tube should be labelled with the specific area of the garment that was sampled.
 - **GSR samples from vehicles may be accepted if hand or clothing samples are not available.**
 - The samples should be collected prior to latent print and/or trace DNA evidence collection.
 - Sample(s) of the vehicle headliner are ideal if it is suspected that a firearm was discharged from within the vehicle.
 - Each tube should be labelled with the specific area of the vehicle that was sampled.
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**Preferred
GSR
collection kits**

Preferred GSR collection kits contain two stubs with carbon adhesive. The following manufacturers provide GSR kits with two stubs and other similar kits may be acceptable.

- Arrowhead Forensics: <https://arrowheadforensics.com>
 - GSR Kit – SEM 2 Carbon Disks: Part # A-7210-2SB (box) or #A-7211-2SE (envelope)
 - Sirchie: www.sirchie.com
 - 2 Stub Forensic Gunshot Residue Field Kit: Product #GRA300
 - Trittech Forensics: www.tritechforensics.com
 - GSR Collection Kit: Product # GSR-2SEM
 - Surface GSR Collection kit: # GSR-SEM/SUR(C)
 - Evident: <https://www.shopevident.com>
 - GSR Collection Envelope kit – SEM – 2 Carbon Disks: Product #36542E
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**For further
information
and additional
resources**

Please contact your regional BFS laboratory with any further questions that you may have.

For a list of regional laboratories please go to:
<https://oag.ca.gov/bfs/services>

To locate the most current Physical Evidence Bulletins please go to:
<https://oag.ca.gov/bfs/peb>
