

Primer Gunshot Residue (pGSR)

Nebraska State Patrol Crime Laboratory

Introduction

Primer gunshot residue (pGSR) is expelled during the discharge of a firearm. It is formed from the explosion of the primer at the base of the cartridge. The residues escape through openings in the firearm and the end of the barrel. pGSR kits are designed to collect these particles and the Trace Evidence section uses SEM/EDS for analysis. **pGSR analysis cannot determine whether or not an individual has discharged a firearm.**

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

- The subject discharged a firearm.
- The subject was in close proximity to the discharge of a firearm.
- The subject was in contact with an object/surface with pGSR on it.

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

- The subject did not discharge a firearm.
- The subject discharged a firearm but pGSR was not deposited in detectable amounts or deposited on the sampled area.
- The subject discharged a firearm but pGSR was removed by wiping or washing prior to the collection of the primer gunshot residue kit.

Interpretations regarding the number of particles on the right versus left hand, specific areas of clothing, or comparing the number of particles between pGSR kits cannot be made due to factors including the variability of transfer and movement after discharge.

GSR examinations will only be conducted in cases where significant information may be obtained. At a minimum, all submissions should meet the following criteria:

Sampling and submission criteria

- **Do not submit kits or clothing from shooting victims (suicide, homicide, assault, etc.)** A shooting victim is known to have been in the environment of a discharged firearm.
- **Do not submit kits collected more than 8 hours after the shooting in question.**
- **Only NSPCL approved kits will be accepted and analyzed.**
- **Do not submit a kit if the subject is found in the possession of or claims to have handled a firearm.** Analysis cannot distinguish between someone having discharged a firearm or simply handling a firearm.
- **pGSR kits/clothing must be individually packaged and submitted separate from other evidence.** Do not package with firearms evidence or any other evidence.
- **Permission must be granted by the Trace Supervisor to submit clothing items for pGSR analysis. pGSR kits must be submitted before clothing when both are available.**
- **Do not submit items for pGSR analysis unless they are associated with an individual.**

- **Testing of pGSR evidence will be limited to cases involving crimes against a person, such as the following offenses:**
 - Homicide
 - Attempted homicide
 - Aggravated assault
 - Aggravated robbery
 - Questioned death or death investigations (suspect, elimination only)
 - **The date and time for the shooting incident and kit collection must be recorded on the pGSR analysis information form.**
 - **Samples should be taken immediately after contact with the subject in the field.** To minimize the risk of contamination and/or loss of pGSR, sample before handcuffing, transporting, or fingerprinting (as soon as situation is safe to do so).
 - **The maximum number of stubs that may be submitted from a vehicle is four.**
 - **Provide a brief summary of the case so an evaluation of pGSR testing suitability may be done (put on submittal form – NSP750).** Include on the submittal who the kit/clothing is from and the timeframe between shooting and collection for kits.
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Cases returned without analysis

The following types of pGSR cases will be returned without analysis:

- Victim kits and clothing (suicide, homicide, assault, etc.)
- Cases involving a felon in possession of a firearm
- pGSR kits other than the NSPCL approved kit
- Kits collected more than 8 hours after the shooting incident
- Kits in which the date and time of incident and collection are not provided
- Kits contrary to the above listed submission criteria

The Trace Evidence Supervisor will evaluate the information provided by the customer. If the lab determines pGSR analysis will not yield results with useful interpretations, the evidence will be returned and a no examination report issued.

pGSR collection kits

Only the collection kit approved by the NSPCL will be analyzed.

- NSPCL will provide an initial allotment of pGSR kits free of charge to agencies
- Initial kits may be obtained from the laboratory or NSP Troop areas
- NSPCL pGSR kits are checked for quality before dissemination to agencies.

NSPCL pGSR kits can be purchased from Tri-Tech Forensics if more are needed

- **Order number: GSR-SEM(Q)NE**
 - May take 4-6 weeks for order to be filled, plan accordingly
 - 800-438-7884, call to order, minimum order – 1 case (10 kits)

Follow the instructions provided with the pGSR kit and fill out GSR analysis information form when submitting a kit.

For further information

Please contact the NSPCL Trace Supervisor Amanda Neely with any further questions.

402-471-8950, Amanda.Neely@nebraska.gov