

Fire Debris

Significance

Laboratory examination of the evidence may reveal:

- The presence and nature of an ignitable liquid. The laboratory does not perform direct comparison of ignitable liquids beyond their individual classification.
- The manner and area where the fire was set.
- The potential connection of a suspect with the arson scene through comparison of trace evidence and latent prints, or identification of similar classes of ignitable liquids.
- The presence of another crime which the fire was planned to conceal, such as a homicide or fraud.

Collection and Packaging

- Contact the crime laboratory if there are any questions concerning the procedures for collecting and packaging fire debris evidence.
- Any liquid found may be ignitable; remember to handle with care.
- Evidence suspected of containing traces of ignitable liquids must be packaged in **vapor tight containers**.
- Each container must be properly labeled and sealed. The containers must be sealed with tape extending across the top of the container and down the sides. The tape must be initialed so that the initials are across the tape onto the container.
- Do **not** place gloves used for collecting and packaging evidence in the evidence container.
- Never package ignitable liquids in a plastic container or a container with a plastic lid.
- Products designed for packaging volatile evidence may be purchased from many evidence packaging supply companies.
- Do **not** use jars without Teflon-lined lids, plastic resealable (ziplock) bags, or garbage bags to package volatile evidence.

The following are acceptable types of packaging for most ignitable liquid/volatile evidence. Exceptions may exist, contact the Crime Laboratory for more information.

Packaging Type	Use	Specifics
Screw-top glass vials with Teflon-lined lids	Liquids	Package the vial upright in a can surrounded by absorbent material such as kitty litter. No more than 5-10 milliliters is necessary.
Clean, unused, lined, metal paint-type cans	Most types of volatile evidence	Never fill more than 2/3 full. Unlined cans will rust through resulting in volatile loss. Lined cans are recommended. Do not use plastic cans or cans with plastic lids. Use a hammer or rubber mallet to tap the circumference of the lid for a proper seal. Do not step on or use excessive force when sealing the can. Debris in the can lid groove will prevent creating a vapor tight seal. Do not submit liquids directly in paint cans.

Polyester and nylon bags designed for volatile storage	Clothing or other debris that does not contain sharp or jagged edges.	The bags must be designed for volatile storage or there is risk of contamination. This is the preferred packaging for shoes. Never fill more than 2/3 full. Heat-seal or roll down the opening three times and tape to secure the bag. The tape must extend the length of the roll and wrap around to the other side of the package on both sides. Test the seal by gently squeezing the bag to ensure it stays taut. If the bag deflates the seal is not sufficient to preserve volatiles
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Special Types of Samples	
Comparison Sample	A sample of material from the fire scene which is identical to the evidence submitted but is believed to not contain an ignitable liquid residue.
Control Sample	A sample of known composition that are analyzed alongside test samples in order to evaluate influences from the sample matrix or packaging/collection material. Examples include an unused piece of gauze consistent with gauze used to mop up a suspected ignitable liquid or an unused paint can consistent with the cans used for evidence storage.
Soil	Bacteria in the soil can destroy petroleum-based products; low temperature will retard bacterial action. Freeze all soil samples after collection. Refrigerate if unable to freeze. Submit these samples to the crime laboratory as soon as possible.
Molotov Cocktails	Package ignitable liquid and wick separately from the bottle, jar, or glass fragments. If there is no visible liquid, the wick remains are more likely to contain residue than the glass. If fingerprint examination is desired, the glass should be stored so it can dry out rapidly. Fingerprints are dissolved by ignitable liquids. Preservation of this evidence for fingerprints may prevent ignitable liquid analysis. If there is insufficient liquid, seal the glass in a vapor-tight container. Separate the larger pieces, which are most likely to contain latent prints, for drying and fingerprint processing. If there is not enough glass to process for both prints and for liquid analysis, a decision must be made as to which of the analyses will be most beneficial to the case.
Burned or Charred Paper (for document examination)	Contact the Crime Laboratory for information on how to collect and package these types of evidence.
Shoes	Shoes are often too long to fit easily into a gallon-size can without significantly bending and/or distorting the sole. It is not known whether or not this will alter the individualizing characteristics of the shoe outsole. To avoid this possibility, seal shoes in a polyester or nylon fire debris bag.

Submission

- The analysis for ignitable liquids must not be delayed, since they may be lost through evaporation, weathering, or bacteriological degradation. If possible, evidence containers should be **stored in the freezer**, or refrigerator if freezing is not possible, prior to submission to the crime lab. Submission of the evidence to the crime lab should be done promptly.

- Whenever possible, submit control and/or comparison samples with every case. It is highly recommended a blank paint can be submitted with every case.
- Always contact the Crime Laboratory for advice on packaging evidence that will require analysis for **DNA and volatiles**.