Exhibit Submission Guidelines

investigationsgroup.

ph. 02 4628 6420
fax. 02 4628 6440

PO Box 612 Campbelltown
NSW 2560 Australia

admin@gkaig.com.au

Release date: 20 October 2015 (updated 11 February 2022)
Issued by: Alexander Visotin, Laboratory Manager

Introduction

Different types of exhibits must be packaged appropriately to ensure they are preserved properly for analysis, whether that be chemical analysis, physical examination, electrical testing, or other types of testing. Improper packaging may produce incorrect testing results or, at worst, render the item wholly unexaminable. This Technical Bulletin aims to provide guidance for the packaging and sealing of items that are to undergo examination or testing.

Items received for testing by GKA Analytical Services that are not packaged and sealed in line with these guidelines may not be accepted for analysis. Our exhibit handling processes are aligned with the strict chain of custody requirements of ISO/IEC 17025 as well as the requirements of our accrediting body, NATA. If, after reading this document, you are still unsure of the appropriate packaging or labelling requirements for your specific exhibit, please contact our office for advice.

Labelling requirements

Applies to ALL items submitted

All items must have complete and legible labels attached to them. This label must contain enough information to identify the exhibit. Affix exhibit labels to the exterior of the exhibit or exhibit container in a visible location. If the exhibit label cannot easily be attached to the exhibit container surface, it may be attached directly to the exhibit using a piece of string or similar device.

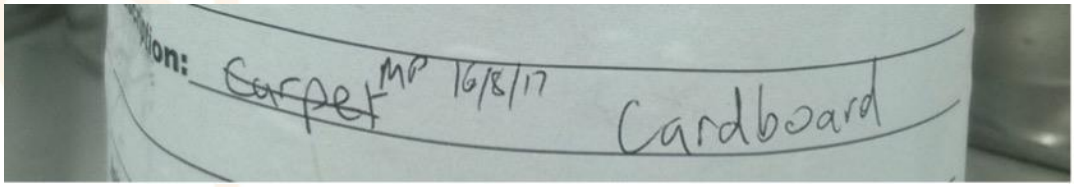
At minimum, the exhibit label must contain:

- Time and date of collection
- Location of collection (including room or general area of the premises)
- Description of the exhibit or material
- Exhibit collector's signature
- Exhibit number
- Case number

Please ensure that the description of the exhibit contains enough information to positively identify the exhibit. For example, avoid using general and unspecific descriptions such as "fire debris". Instead, specify the type of material present.

If a complete exhibit label cannot be attached to the exhibit, the required information must be submitted to the laboratory electronically. This can be done via the Exhibit Transmittal Form on the GKA Analytical Services website. Ensure all necessary fields are filled in before submitting the form. Note that some form of identifying information must still be present on the exhibit to associate it with the information sent electronically.

If a mistake is made when filling out an exhibit label, a new label must be applied to the exhibit, or the mistake must be eliminated (crossed out) with a single horizontal line through the unwanted text. It is important that the unwanted text is still legible after it has been crossed out. Eliminations must be initialled and dated. Continue writing on the label as normal after the elimination.



Example of properly corrected text on an exhibit label, including date and initials

If the exhibit is packaged in a dirty container, wipe down the container after it has been sealed.

If exhibits are collected from a scene containing friable asbestos, include text on the exhibit label specifying that asbestos may be present (e.g., “MAY CONTAIN ASBESTOS”).

Packaging guidelines for general exhibits

Applies to items sent for physical examination (electrical, mechanical, metallurgical, etc.)

Exhibits must be packaged in such a way as to protect them from damage during transport and the environment. Small items may be packaged into cardboard boxes, tins, or bags. Larger items such as whitegoods can be packaged using garbage bags, plastic wrap, or tarpaulin, and secured with tape or rope.

Secure any loose parts inside the largest piece of the exhibit, or package them as separate exhibits.

Ensure that the packaging is robust enough to withstand environmental effects such as rain and wind, and that it will reasonably contain the exhibit. Exhibits with sharp edges should be packaged in a container that will withstand puncture. Alternatively, the sharp edges can be protected with material such as foam.

Packaging must be sealed such that items will not be able to enter or exit the packaging during transport.

Packaging guidelines for fire debris samples

Applies to items sent for chemical analysis (ignitable liquid residues, organic oils, etc.)

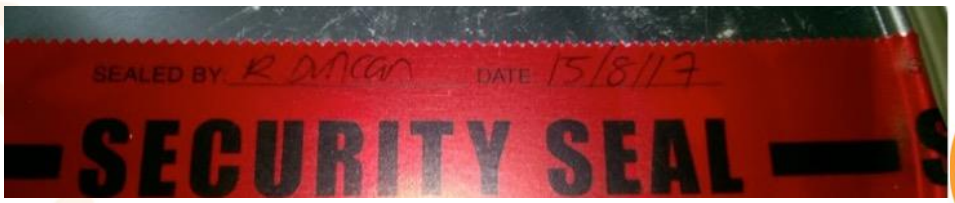
Wear sterile examination gloves when collecting and packaging fire debris samples. Dispose of each pair of gloves after collecting each sample. Do not place used gloves inside the evidence container with the fire debris. If using a consumable/disposable item to collect samples such as a disposable pipette, dispose of the item after collecting each sample. Do not place anything inside the container except for the debris to be tested.

Fire debris analysis relies on the detection of volatile organic compounds that are trapped within the sample substrate. If not properly packaged, the chemical composition of the sample can be altered, resulting in false negative results (from loss of the sample) or false positive results (from contamination).

Containers must be airtight and impermeable to gases. Containers used for fire debris must also be free of hydrocarbon contaminants, as determined by our laboratory. To assess whether your container is appropriate, submit a clean and unused container to our laboratory for testing. A list of recommended containers and collection media is presented on the following pages.

Do not submit leaking or wet sample containers. If you can smell pyrolysis products when the container is brought to your nose, the container is either improperly sealed, the exterior of the container is contaminated, or the container may be inappropriate for the debris. Discard the contaminated container and collect the sample in a new one.

A length of tamper-proof security tape must be placed across the container seal. The tape must be placed in such a way that opening the container would disrupt the tape. For metal tins, tape may be run across the top and down the sides of the tin. For bags, place a strip of tape across the knot or seal. For vials, the tape can be wrapped around the perimeter of the cap. The tape must be signed and dated by the sample collector.



Example of a signed security tape seal

Collection methodology for solid fire debris samples

Debris in the form of small items and fragments must be collected in airtight containers such as metal paint tins. We recommend submission of fire debris samples in metal tins wherever possible. Canning (mason) jars can also be used as long as they do not have a rubber sealing gasket. Food packaging companies, industrial container manufacturers, and forensic suppliers can supply these items. Whichever container is used, the lid seal must be strong and secure. Cardboard boxes and plastic food storage containers should never be used for fire debris.

Appropriate fire debris packaging: metal tins and properly sealed fire debris bags.

Inappropriate fire debris packaging: cardboard boxes and regular plastic shopping bags.

Collect the debris by physically moving the debris into the sample container using hands or tools and sealing the lid. If tools are used to assist in collection, ensure they are free of hydrocarbon contaminants by washing thoroughly with detergent and water.

Fill the container approximately three-quarters full. Do not overfill the container. If the container is too full, it may require separation into two separate samples, resulting in another analysis fee. If the debris smells strongly of a petroleum product, only a very small sample of it is required.

Do not overfill sample containers. This tin is too full.

If the container has a friction lid, seal the lid with a mallet or similar device to ensure the lid is sealed as tightly as possible. You may need to clear debris from the seal area to obtain a tight seal. Screw-top lids must be screwed tightly shut.

Items of debris that do not fit into rigid containers can be packaged in polymer fire debris bags. Special fire debris bags can be purchased from forensic suppliers for this purpose. We recommend bags manufactured by Kapak (USA) or ProAmpac (USA), which are specifically designed for fire debris analysis. Food packaging suppliers may also carry suitable bags. It is important that the selected bags are manufactured from polyester or nylon. Bags must be free of hydrocarbon contaminants, as determined by our laboratory. To assess whether your bag is appropriate, submit a clean and unused bag to our laboratory for testing.

Regular plastic shopping bags, freezer bags and sandwich bags should never be used for fire debris. Bags manufactured from polyethylene, polystyrene, and polypropylene should also never be used. The bag must be secured in such a way as to prevent volatile compounds from escaping. The best method of sealing in this regard is heat-sealing. We recommend submission of polymer fire debris bags with heat seals wherever possible. Portable heat sealers can be purchased relatively inexpensively and are ideal for sealing bags at the point of collection.

If a heat sealer cannot be used, bags should be twisted tightly closed. After twisting as many times as possible, the twist should be folded over or knotted. Tape should then be applied over the fold or knot to trap any volatiles that may make their way through the obstruction. Finally, cable ties or rope should be installed over the knot or fold to secure it in place even further. The cable ties or rope should be tightened as much as physically possible. The more secure the bag seal can be made, the better.

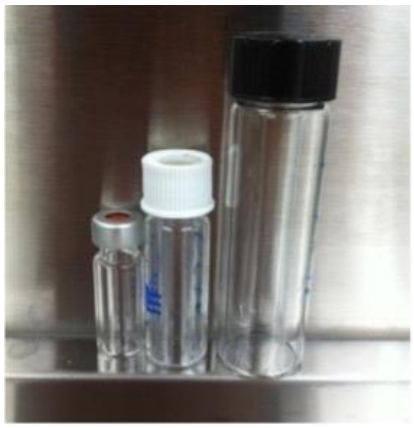
Well-sealed plastic bag: twisted shut, gooseneck tie, cable ties, and tape.

If even larger samples are required for fire debris testing that do not fit into fire debris bags, it is advisable to subdivide the item into multiple smaller samples and package these individually. Our laboratory will not accept samples submitted without appropriate packaging.

Collection methodology for liquid samples

If the liquid is in a pool, a small volume of the liquid can be subsampled and collected. These liquids can be decanted directly into glass sample vials or aspirated via pipette. Vials and pipettes may be purchased from laboratory equipment suppliers. Our laboratory can also supply liquid sampling kits containing vials, pipettes, and labels. Contact our office if you would like to order these sampling kits.

When sampling neat liquids, only a small amount is required for basic ignitable liquid identification (less than 1 mL). Secure the cap to the vial tightly after sampling. Vials must be submitted with exhibit labels containing all the necessary sample information as indicated on page 1.



Different types of glass sample vials.

Collection methodology for dry residues or stains

If the liquid has partially dried or is only present in small amounts, it can be collected by absorption. We recommend the use of Pig® Oil-Only Absorbent Mat Pads to absorb these residues, as studies have shown these pads to be the most appropriate for fire debris sampling. They are available from New Pig (USA, product no. MAT423), or Australian distributors. Pads require baking to ensure they are free of contaminants before being used and can be baked at 120 C for 16 hours for this purpose. The pads must be always kept in a sealed tin or other airtight package when not in use.

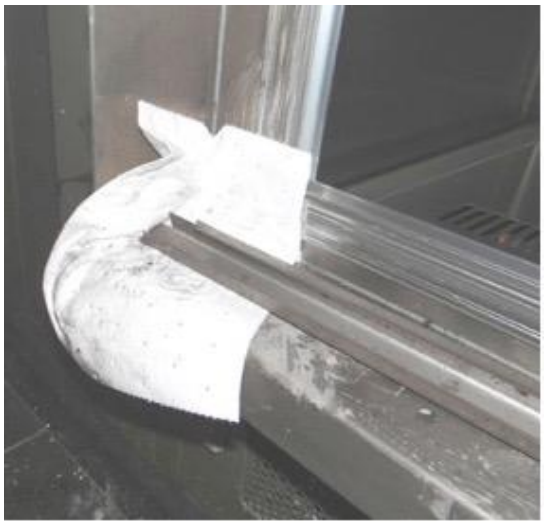
Pig Oil-Only Absorbent Mat Padding.

Alternatively, any inert, contaminant-free absorbent material may be used for sampling. To assess whether your sampling media is appropriate, submit a sample to our laboratory for testing.

To collect the sample, dab the absorbent material around the sampling area. If the residue is difficult to remove, use a wiping motion. Apply pressure if necessary. Rub the material onto the hard surface to remove small amounts of residue trapped in the substrate. Leave the pad on the sampling area until it has soaked up as much of the stain as possible.

If using the recommended Oil-Only Absorbent Mat Pads, you may use a small amount of water to mobilise the residue before applying the pad. Note that this technique will not be effective unless using the recommended absorbent pads. In all other cases, water should never be used to collect samples for fire debris analysis.

After sampling, place the absorbent into a regular sample container and label as a normal sample.



Application of an absorbent pad during sampling (Burda et al., 2016)

Bibliography

Burda, K., Black, M., Djulamerovic, S., Darwen, K., & Hollier, K. (2016). Field test kits for collection of ignitable liquids and ignitable liquid residues used by the NSW fire scene investigators. Forensic Science International , 264, 70-81.

Carlsson, G. (1993). Conserving samples of fire debris suspected of containing accelerants. Advances in Forensic Sciences - Proceedings of the 13th meeting of the IAFS (pp. 187-190). Dusseldorf: International Association of Forensic Sciences.

Dehaan, J., & Icove, D. (2012). Kirk's Fire Investigation (7th ed.). Upper Saddle River: Pearson.
Demers-Kohls, J. (1994). An evaluation of different evidence bags used for sampling and storage of fire debris. Canadian Society for Forensic Science Journal , 27 (3), 143-70.

Lang, T. (1999). A study of contamination in fire debris containers. Canadian Society for Forensic Science Journal , 32 (2 & 3), 75-83.

Lentini, J. (2006). Scientific Protocols for Fire Investigation. Boca Raton: Taylor & Francis.

Mann, D. (2000). In search of the perfect container for fire debris evidence. Fire and Arson Investigator , 50 (3), 21-25.

National Fire Protection Association. (2017). NFPA 921. Quincy: National Fire Protection Association.

Stauffer, E., Dolan, J. A., & Newman, R. (2008). Fire Debris Analysis. Burlington: Academic Press.

Stryjnik, A., & Hong-You, R. (2004). Evaluation of the effectiveness of nylon bags as packaging for fire debris. 56th Annual Meeting of the American Academy of Forensic Sciences. Dallas.

Tontarski Jr, R. (1983). Evaluation of polyethylene containers used to collect evidence for accelerant detection. Journal of Forensic Sciences , 28 (2), 440-445.