

Arson

Many times it is difficult to ascertain whether a fire was accidental or arson. This is especially true when simple ignition devices such as a match and paper were used to start the fire. Frequently, flammable liquids such as gasoline, oil, fuel oil, charcoal lighter fluid, etc., are used as accelerants. If used, and if the fire origin can be determined, it may be possible to detect and classify accelerants.

The Laboratory is equipped with sensitive instruments capable of detecting and classifying trace quantities of volatile hydrocarbons. Detection is not possible if the fire completely consumes the accelerant or if the samples are not from the fire's origin. Because flammable liquids readily evaporate, great care must be taken in the collection and packaging of fire debris suspected of containing them. Containers of arson evidence need to be airtight to prevent loss by evaporation and possible contamination. Moisture is not a problem. **Do not air dry arson evidence.**

Caution: Observe laws relating to the collection of evidence.

In considering whether or not a fire is a case of arson, review the possible motives (financial gain, personal satisfaction, concealment of another crime, revenge or pyromania). The following is a brief general procedural guide for use in investigation of suspected arson cases.

I. Procedure at Crime Scene

- A.** Note (and photograph to scale whenever applicable):
1. Condition of all locks, doors, windows. If entry has been forced, see Chapter 14, Burglary and Chapter 15, Building Materials.
 2. Origin of fire (one or many sites?).
 3. Identification of igniting material (foreign to the scene?).
 4. Presence of flammable liquids by:
 - a. Odor of petroleum products, paint solvents, alcohol, etc.
 - b. Stains on floor or other material

- c. Evidence of explosions not due to heat (shattered glass)
 - d. Unusual burn patterns (splashed areas or trailers)
 - e. Rapid spread of fire not explainable by structure, weather, or other conditions
 - f. Smoke not explainable by building materials
 - g. Characteristic heavy soot
 - h. Unusual flame coloration
5. Evidence of another crime which the fire might conceal (items stolen, evidence of violence).
 6. Recent similar fires in the vicinity (date, time, location, intended victim).
- B.** Collect in separate, airtight containers (e.g., one-pint through five-gallon new, unused, unlined metal paint cans):
1. All igniting devices (fuses, candles, wicks, trailers, rags, etc.).
 2. Charred debris and related material from the origin where the accelerant was placed (container should be one-half to three-quarters full).
 3. Samples of plaster, upholstery, wood or other substances that may have been penetrated by flammable liquids. Any fresh stains should be collected.
 4. Samples of soil (two to three quarts) which may have been saturated by flammable fluids (container should be three-quarters full).
 5. Any trace evidence left by the arsonist such as hair, clothing, fibers, bloodstains, fingerprints, etc. (For proper collection procedure, see chapter pertaining to that specific type of evidence.)
 6. Any and all tools or pieces of metal at the scene (airtight container not necessary).
 7. Liquids should be collected in airtight clean glass bottles sealed with Teflon®-lined caps or absorbed onto a clean cloth and placed in an airtight container.
 8. Samples of carpeting and/or padding which readily absorb flammable liquids collected from around the point of origin (in vehicles as well as buildings). **A sample of uncontaminated carpeting and/or padding must be collected separately and submitted for comparison purposes.**

9. When fire debris consists of carpeting, cloth, plastics, polymers, synthetics or other material, uncontaminated known samples must be collected separately and submitted. Control samples allow the scientist to distinguish between natural or fire-produced artifacts and flammable liquids.
- C.** If a container is found that has a flammable label on it and is suspected of being involved in the fire, a container of the same labeling should be purchased from an area store and submitted to the Laboratory. If unavailable, send in the description of the flammable contents from the label.
- D.** In cases involving large volumes of flammable liquids or suspected flammable liquids, contact the Laboratory for the proper procedures in handling and packaging.

II. Suspects

Incidental to arrest, with consent, with a search warrant, or with a combination of the above, obtain the following:

- A.** Fuels, flammable solvents, tools or starting devices in the suspect's car and home. Submit fire-starting devices only after they have been deactivated and properly packaged.
- B.** Clothing worn at the time of the crime, including shoes (package in clean, unlined paint cans or specifically made fire debris nylon bags).
- C.** Any stains from the vehicle's interior if possible. The car may have been involved in transporting the suspect or incendiary materials to or from the crime scene.
- D.** Any trace evidence (paint, glass, building materials, etc.) which might connect the suspect to the scene found on the suspect's clothing or in the suspect's car or home.



Fig. 31-1
New, clean, unlined paint cans make ideal containers for preserving evidence suspected of containing accelerants. Cans are available from paint stores or wholesalers.

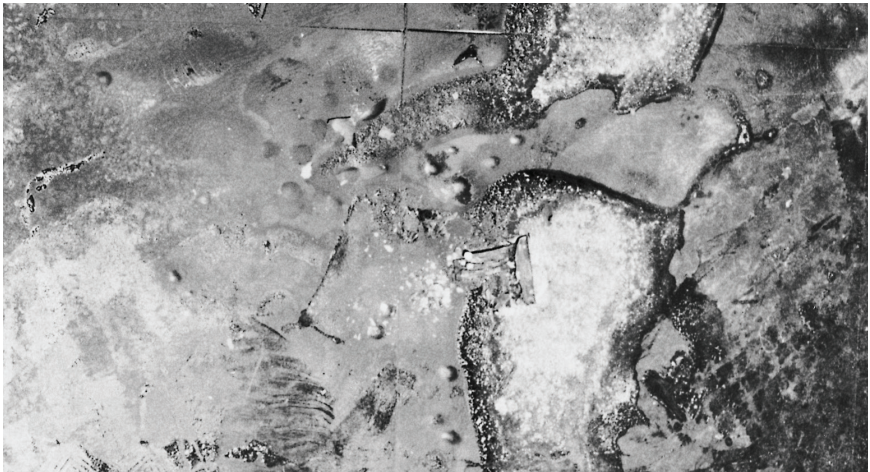


Fig. 31-2
Char pattern typical of the use of accelerants. The area where the accelerant is in contact burns hotter and therefore leaves a char pattern that is different from surrounding areas. Door propped open, holes chopped in floors, "trailer" used to direct the fire from one area to another, etc., are all reasons to suspect that a fire is due to arson.