FIRE INVESTIGATION TOOLS AND EQUIPMENT

Every fire investigator charged with performing origin and cause examinations should have (or have ready access to) a basic equipment kit.

- A fire investigator's tools must never be coated with any type of rust preventative.
- Each tool that comes into direct contact with suspected accelerant evidence samples (such as a chisel, utility knife or other cutting tool) must be properly cleaned before it can be used in sampling procedures.
- Cutting surface(s) of tools should be cleansed with isopropyl alcohol and clean paper wipes then immediately flushed with a strong stream of fresh water.
- Certain tools cannot be adequately cleaned and reused once they are contaminated with an accelerant such as gasoline. Brooms, paint brushes, firefighter gloves are several examples.
- Using steel tools enables effective cleaning and hence minimizes the opportunity for cross contamination.
- Always seal steel evidence containers when they are delivered from the supplier.
- Open these containers at the sampling site only.
- Load evidence samples correctly and reseal containers immediately.
- Never place open steel evidence containers in the rear of your car.
- Always use appropriate safety gear (especially safety glasses and helmet).

What follows is a comprehensive list of tools compiled from a variety of published sources. It should not be construed as a "must have" list, but as a starting point for fire investigators to use to determine their own needs. The determination of the toolkit contents is the responsibility of the investigator and is determined by his/her requirements, local standards and needs, and investigative preferences.

Safety

- Hard Hat/Helmet
- Leather Work Gloves
- Nitrile Disposable Gloves
- Steel Toe/Steel Shank Shoes or Boots
- Eye Protection (Safety Glasses/Goggles)
- Turnout Gear
- Nomex Coveralls (or USAR-type coveralls with reinforced knees)
- Disposable Tyvek Outer garment
- Respirator (1/2 face / full-face) and spare cartridges (HEPA / organic vapor / acid gas)
- SCBA (or access to SCBA if warranted based on scene conditions)
- Dawn Detergent (for DECON of contaminated gear and equipment)
- Dust mask(s) – N95
- Flashlight
- Disposable Latex Booties (to wear over boots if necessary)
- Nomex/PBI hood
- 3 or 4 Gas Air Monitor

Excavation

- Broom
- Bucket
• Chisels
  o Cold chisels
  o Wood chisels
• Communications equipment
  o Cellular telephone
  o Facsimile machine (cellular, office)
  o Pager
  o Radio
  o Telephone
  o Portable computer w/ modem
  o Portable radio
  o Public address system
• Crowbar/prybar
• Cutter(s), cutting tools
  o Bolt cutters
  o Carpet cutters
  o Pen knife
  o Pipe cutters
  o Pocket knife
  o Razor blades
  o Tin snips
  o Utility knife (extra blades)
• Drill with wood and metal bits
• Electrician's tools
  o Circuit continuity tester
  o Electrical tape
  o Fuse puller
  o Ground fault/phase tester
  o Volt/Ohm/amp meter
  o Wire cutters
  o Wire gauge
  o Wire stripper
• Flat-head shovel
• Hammers
  o Ballpeen
  o Claw
  o Sledge
• Hand axe/hatchet
• Heavy-duty street broom
• Hoe
• Level (torpedo and bar)
• Long-handle squeegee
• Mason or brick trowel
• Pinch bars (12 inch)
• Rake
• Saws
  o Crosscut
  o Hack (with extra blades)
  o Keyhole
  o Scroll
• Screwdriver (assorted sizes)
• Bit driver with assorted bits
• Phillips head
• Straight blade
• Screws, nails, tacks, staples

• Steel box (to hold tools, at least 18 inches by 9 inches with tray is recommended)
• Steel-tine garden rake

• Vehicle Equipment
  • AC/DC charger
  • First aid kit
  • Flood lights
  • Fuses/light sticks
  • Jumper cables
  • Mobile radio
  • Portable fire extinguisher
  • Public address system
  • Reflective markers
  • Siren

• Wrenches
  • Adjustable
  • Open-end or box
  • Pipe

**Evidence Collection**

• Sample Collection:
  • Activated charcoal
  • Blotter strips
  • Broom
  • Brushes
  • Chisels
  • Cotton tipped swabs
  • Cotton baby diapers, clean, unused
  • Dental tools
  • Disposable sterile pipets w/ suction bulbs
  • Disposable gloves (latex)
  • Disposable syringes
  • Dust pans
  • Eye dropper
  • Forceps
  • Handsaws (electric circular saw if possible)
  • Hand towel
  • Isopropyl alcohol with a supply of clean paper wipes (to permit on-site cleaning of blade tools)
  • Ladder
  • Modeling knife
  • Paint brushes
  • Paper towels/wiping cloths
  • Pipe wrench
  • Pliers
  • Lineman's
  • Side-cutting
• Slip-lock
• Vise-grip
• Plumb bob
• Putty knives/scrapper
• Pry bars
• Scalpel
• Sifting screens or sieve
• Soap and hand cleaner
• Styrofoam cups
• Tongs
• Tweezers
• Water

• Detection Equipment
  o Combustible gas/vapor detector
  o Hydrocarbon detector with supply of filters and spare hose and battery
  o pH paper
  o Thermometer, dry bulb
  o Thermometer, wet bulb
  o UV (black) light
  o Velometer
  o Voltmeter/ohmmeter

• Measuring Equipment
  o 6-inch ruler
  o 12-inch ruler
  o Folding ruler
  o 6 to 12 foot tape measure
  o Steel tape measure (100 foot)
  o Optical tape measure (for exterior scenes)
  o Sturdy tire depth gauge tool (measuring depth of char)
  o Pencil magnet (to determine the type of metal examined)

• Packing Materials
  o Cellophane tape
  o Clean metal paint cans
  o Clean glass jars with metal or bakelite, screw top lids, assorted sizes
  o Clean glass vials with screw top lids
  o Clean butcher paper (large sheets or roll)
  o Cotton swabs
  o Cotton wool
  o Evidence stickers, labels, and tape
  o Masking tape
  o Paper envelopes--various sizes (coin to 10 by 12-inch clasp-type)
  o Paper grocery bags(various sizes
  o Polyester or nylon bags(various sizes
  o Rope
  o Scene banner tape
  o Surgical gauze (pads best)
  o String
  o Twine

• Impression casting (optional)
  o Plastic mixing bowls (large)
  o Kitchen strainer
- Plastic kitchen spatulas
- Metal or plastic strips (for edging mold area)
- Supply of plaster (in sealed metal can)
- Canning paraffin and small pan for melting
- Silicon rubber casting medium (for tool impressions)

**Documentation**

- Cardboard boxes, assorted sizes
- Clipboard
- Containers, packaging materials
- Document protectors
- Drawing equipment
  - Compass
  - Drafting templates
  - Pens, pencils, markers
  - Protractor
  - Scale
- Evidence tape (tamper indicating)
- Fingerprint kit
- Glass jars w/ screw top lids, assorted sizes
- Glass vials w/ screw top lids
- Graph paper (drawing diagrams)
- Lined paper - notebooks, writing tablets
- Magnet
- Magnetic compass
- Magnifying glass
- Pencil "scribe" for evidence marking on metal, plastic, or glass
- Portable tape recorder
- Portable illumination
  - Portable flood light and generators
  - Flashlights
  - Battery-powered fluorescent lights
  - High intensity movie lights for lighting large areas (short battery life)
- Transparent tape
- Vermiculite
- Photographic and Video Equipment
  - Batteries
  - Camera - 35 mm automatic, 35 mm SLR
  - Film, extra
  - Flash
  - Flash attachment
  - Instant camera macro attachment
  - Lenses
    - 70 - 200 mm zoom
    - 28 - 70 mm zoom
    - 50 mm
  - Meter
  - Light motor winder
  - Photographic background
  - Photographic logs
Photographic ruler
Protective carrying cases
Tripod
Videotape boom microphone
Videotape lighting attachment
Videocassettes, blank, spare