

Bulb Examinations

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Bulb Examinations

1 INTRODUCTION

Bulbs are usually constructed with a sealed glass globe containing a filament attached to two leg wires. The wires may terminate into connections within a base designed to be attached to a specific receptacle for that particular bulb. An appropriate current from a power source applied to the wires causes the filament to heat up, therefore they can be used in electrical fuzing systems to initiate heat-sensitive energetic materials (EMs) in improvised explosive devices (IEDs) or improvised incendiary devices (IIDs), collectively hereafter referred to as devices.

Bulb remnants can survive the explosion of a device. From the examination of their remnants it is sometimes possible to identify the bulb manufacturer and brand. This information can assist the investigator in identifying the subject(s) responsible for constructing the device.

2 SCOPE

These procedures describe the process for bulb examinations and apply to explosives and hazardous devices personnel who examine bulbs and their post-blast remains to determine identifying and functionality information.

3 EQUIPMENT

Below is a list of items that can be used to examine bulbs and their post-blast remains. Explosives and hazardous devices personnel should choose the most appropriate items based on the nature of the evidence.

- Personal protective equipment (e.g., lab coat, eye protection, gloves)
- Hand tools (e.g., tweezers, pliers, utility knife)
- Cleaning materials and disinfectants (e.g., cloths, bleach, rubbing alcohol)
- Stereomicroscope (various magnifications)
- Ruler (e.g., standard 12 inch length)
- Micrometer
- Caliper
- Multimeter
- FBI Laboratory Explosives Reference Tool (EXPeRT) Database
- Reference texts, manuals, manufacturers' literature, and known materials are maintained in the explosives library. Additional reference information can be obtained from direct contact with manufacturers and distributors.

4 PROCEDURE

These procedures are implemented as part of the overall examination process outlined in the Explosives and Hazardous Devices Examinations Technical Procedure (TP).

Explosives and hazardous devices personnel will:

- A. Before any examinations are conducted, ensure that the item(s) and its container(s) and packaging have been appropriately marked in accordance with the [FBI](#)

[Laboratory Operations Manual \(LOM\)](#) (i.e., item number, initials, and full Laboratory number, when practicable).

- B. Ensure care is taken not to obliterate any microscopic and/or identifying marks of value which have been previously placed on the item(s).
- C. Visually examine the item for any trace evidence that could be of value. This evidence could include, but not limited to the following: hairs, fibers, blood, paint, or other particles.
 - 1. If trace evidence is to be examined or preserved, contact the appropriate unit and determine if the material should be removed. Record the material by means of notes, sketches, or photographs before it is removed.
- D. Note the physical characteristics of the bulb through visual/microscopic examination. Physical measurements should be taken as well to aid in determining as many of the following attributes as possible:
 - o Manufacturer
 - o Type
 - o Special properties (e.g., physical condition, functionality, modifications made for use in device)
- E. If possible, determine the manufacturer, brand, and type by searching the EXPeRT database, explosive reference files, manufacturers' literature, and/or reference or known materials collection. Identifications or associations are made by comparison of observable/measurable physical characteristics with those provided in the above reference/literature materials.

5 LIMITATIONS

Refer to the Limitations section in the Explosives and Hazardous Devices Examinations TP and Appendix A of the Explosives and Hazardous Devices Report Writing Guidelines.

6 SAFETY

Safety protocols, contained within the [FBI Laboratory Safety Manual](#), will be observed at all times.

- A. Protective gloves (e.g., latex, nitrile) should be worn when handling evidence.
- B. Bulbs that have not functioned can be susceptible to static electricity and should be protected from extraneous current sources and static by placing them in static-proof or static-dissipative containers or bags. Bulbs should be shunted if the bulbs have been modified with the addition of wire.
- C. Eye protection should be worn when examining bulbs.
- D. Items containing blood or other body fluids can be cleaned with a bleach-based solution or other suitable disinfectant following discussions with personnel that may conduct other examinations of the items.

7 REVISION HISTORY

Revision	Issued	Changes
02	06/15/2022	Changed title to Bulb Examinations. Updated to new document template and updates made throughout for clarity.