

Flashbulb / Light Bulb Examinations

1 Scope

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

2 Introduction

Flashbulbs have been commonly used by photographers to provide light in situations where there is insufficient natural lighting in which to take a photograph. Flashbulbs can only be used one time to provide a source of light, then discarded. The use of flashbulbs in photography, has been almost totally replaced by electronic flash units.

Functioning light bulbs provide continuous lighting when a source of electricity (AC or DC) is applied to them. For the purposes of this document, incandescent light bulbs found in flashlights will be the only type of light bulb discussed.

Flashbulbs and flashlight bulbs are constructed in a like, but not identical, manner. Each has a sealed glass globe, containing a filament, which is attached to two leg wires that terminate into connections within the metal or plastic base. A base is attached to a receptacle designed to accept a particular type of bulb for its specific application.

Since flashbulbs and flashlight bulbs produce heat when used, they have been utilized in electric fuzing systems of improvised explosive devices (IEDs) to initiate low explosives or heat sensitive high explosives. As such, the explosives are caused to function from the heat generated from operation of the bulb. It is noted that the bulbs must be in close or in intimate contact with the explosive before ignition can occur.

When used in an IED, flashbulbs and flashlight bulbs often survive the explosion. From the examination of the remains, it is possible to identify a particular bulb as having been manufactured by a specific manufacturer and to determine the brand of the bulb. These examinations assist the investigator by providing investigative information which can facilitate the identification of the subject(s) and/or group responsible for constructing the device.

3 Equipment/Material/Reagents

Below is a list of items that can be used to examine flashbulb/light 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 Standards and Controls

Not applicable.

5 Sampling or Sample Selection

Not applicable.

6 Procedures

These procedures are implemented as part of the overall examination process outlined in the Device Examinations Standard Operating Procedure (SOP).

Explosives and hazardous devices personnel will:

6.1 Before any examination is 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).

6.2 Ensure care is taken not to obliterate any microscopic and/or identifying marks of value which have been previously placed on the item(s).

6.3 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.

6.3.1 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.

6.4 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:

- Manufacturer
- Type
- Special properties (e.g., physical condition, functionality, modifications made for use in IED)

6.5 If possible, determine the manufacturer, brand, and type by searching the EXPeRT data base, 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.

7 Calculations

Not applicable.

8 Measurement Uncertainty

Not applicable.

9 Limitations

Refer to the Limitations section in the Device Examinations SOP and Appendix B of the Explosives and Hazardous Devices Report Writing Guidelines SOP.

10 Safety

Safety protocols, contained within the FBI Laboratory Safety Manual, will be observed at all times.

10.1 Flashbulbs that have not functioned are susceptible to static electricity. Therefore, they will be protected from static electricity discharge by placing them in static free plastic bags. Additionally, flashbulb and flashlight bulbs will be shunted if the bulbs have been modified with the addition of wire. Appropriate packaging will be used to protect from heat, shock, and friction.

10.1.1 Eye protection and gloves will be worn at all times when examining bulbs.

10.2 Protective gloves (e.g., latex, nitrile) must be worn when handling broken bulbs or bulbs that have possibly been exposed to blood, tissue, or other bodily fluids. Gloves will

prevent exposure of personnel to possible hazardous material on the items.

10.3 Items potentially containing blood or other bodily fluids will be cleaned in a 2.5% bleach solution or other suitable disinfectant following discussions with personnel that may conduct other examinations of the items.

11 References

FBI Laboratory Division

FBI Laboratory Quality Assurance Manual, Federal Bureau of Investigation, Laboratory Division, latest revision.

FBI Laboratory Operations Manual, Federal Bureau of Investigation, Laboratory Division, latest revision.

FBI Laboratory Safety Manual, Federal Bureau of Investigation, Laboratory Division, latest revision.

Explosive Devices SOPs, Federal Bureau of Investigation, Laboratory Division, latest revisions.

Other

Bloomfield, L.A., How Everything Works, John Wiley and Sons Inc., 2007

Brain, M., How Stuff Works, Hungry Minds Inc., 2001

Brain, M., More How Stuff Works, Wiley Publishing Inc., 2003

<u>Rev. #</u>	<u>Issue Date</u>	<u>History</u>
0	07/07/2006	Original Issue to follow QATU formatting and ASCLD/LAB-International requirements
1	10/02/2017	Administrative changes for grammar, clarity, and conformance to revised QAM and LOM. Removed references to the Explosives Unit to applicability to those conducting explosives and hazardous devices related examinations. Deleted Calibration section since it is not required. Updated Limitations section to refer the reader to the Device Examination SOP and Appendix B of the Explosives and Hazardous Devices Report Writing Guidelines SOP. Updated references.

Approval

Redacted - Signatures on File

Explosives Unit Chief

Date: 10/02/2017

TL Approval

Explosives and Hazardous
Devices Technical Leader

Date: 10/02/2017

QA Approval

Quality Manager

Date: 10/02/2017