

## Highway Fusee Examinations

### 1 Scope

These procedures describe the process for highway fusee examinations and apply to explosives and hazardous devices caseworking personnel who examine highway fusees to determine identifying and functionality information.

### 2 Introduction

Highway safety flares, or fusees, are manufactured for use as a safety signaling device. They function by burning a pyrotechnic mixture which produces a bright light. Following their use, little remains except an ash residue and a metal stand which may have been used to hold the fusee upright during burning.

Fusees are commonly utilized in the fabrication of hoax bomb devices which are built to resemble an actual improvised explosive device (IED). The specific use of the fusee in the hoax device is to simulate an explosive main charge, which is made to look like dynamite. Normally, these devices do not contain any explosives or explosive accessories.

Fusees can be identified as being manufactured by a specific manufacturer. This identification assists the investigator in identifying the individual(s) and/or group responsible for fabricating the hoax bomb device.

### 3 Equipment/Material/Reagents

Below is a list of items that can be used to examine highway fusees and their 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
- Pillboxes, glass containers, and static-proof plastic bags
- 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 identifying marks which have been previously placed on the fusee, or obliterate any microscopic marks of value.

**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, 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 fusee through visual/microscopic examination. Physical measurements should be taken to aid in determining as many of the following attributes as possible:

- Manufacturer
- Brand
- Type
- Date/plant/shift code
- 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 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.

## **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** Intact fusees are a fire hazard and are sensitive to heat, shock, and friction. Fusees will be handled with care so as to preclude accidental initiation which can ultimately result in fire ignition. The following guidance is provided:

**10.1.1** When not under examination, fusees will be stored in appropriate containers (paper boxes or metal cans).

**10.1.2** When being examined, fusees will not be placed in the close proximity to heat or in locations where they may fall or other materials may fall on them.

**10.2** Protective gloves (e.g., latex, nitrile) must be worn when handling fusees that have possibly exposed to blood, tissue, or other bodily fluids. Gloves will prevent exposure of personnel to possible hazardous material on the items.

**10.3** Fusees potentially bearing 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 fusees.

## 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*

Conkling, J.A. & Mocella, C.J., Chemistry of Pyrotechnics, 2<sup>nd</sup> Edition, CRC Press, 2011

Ellern, H., Military and Civilian Pyrotechnics, Chemical Publishing Company Inc., 1968

Kubota, N., Propellants and Explosives – Thermochemical Aspects of Combustion, 2<sup>nd</sup> Edition, 2007

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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

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