

Model Rocket Motor Igniter Examinations

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1 INTRODUCTION

Model rocket motor igniters are used by hobbyists to initiate rocket motors in a model rocket. Igniters are constructed from two lengths of wire that are attached to each other by a bridge wire that has a heat-sensitive, energetic material (EM) around it. Upon application of current through the wires, the bridge wire heats up and causes the EM to violently burn and initiate the rocket motor. Model rocket motor igniters can be used as part of electrical fuzing systems to initiate the EM in improvised explosive devices (IEDs) or improvised incendiary devices (IIDs).

Through an examination of the fragmented remains of an igniter, its functionality within the device and manufacturing information can sometimes be determined. This information can assist the investigator in identifying the subject(s) responsible for constructing the device.

2 SCOPE

These procedures describe the process for model rocket motor igniter examinations and apply to explosives and hazardous devices personnel who examine model rocket motor igniters 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 model rocket motor igniters 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, full face shield, gloves)
- Hand tools (e.g., tweezers, pliers, cutters, wire strippers, utility knife)
- Cleaning materials and disinfectants (e.g., cloths, bleach, rubbing alcohol)
- Stereomicroscope (various magnifications)
- Ruler (e.g., standard 12-inch length)
- Micrometer
- Caliper
- X-ray machine
- Multimeter
- Pillboxes, glass containers, 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 PROCEDURE

These procedures are implemented as part of the overall examination process outlined in the Explosives and Hazardous Devices Examinations Technical Procedure (TP). Refer to the Safety section of this TP before starting any examinations.

Explosives and hazardous devices personnel will:

- A. Before any examinations are conducted, ensure that the items, as well as their containers 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. Take precautions to not obliterate any identifying marks which on the igniter or obliterate any microscopic marks of value.
- C. Take photographs of the items to aid documentation and device reconstruction.
- D. Visually examine the items for any trace evidence that could be of value. This evidence could include, but not be limited to, hairs, fibers, blood, paint, or other particles.
- E. If trace evidence is to be examined or preserved, contact the appropriate unit and determine if the material should be removed. Record the presence of the material by means of notes, sketches, or photographs before it is removed.
- F. Note the physical characteristics of the igniter through visual/microscopic examination. Physical measurements should be taken to aid in determining as many of the following attributes as possible:
 - o Construction characteristics
 - o Manufacturer
 - o Country of manufacture
 - o Brand
 - o Type
 - o EMs present
 - o Special properties (e.g., physical condition, functionality, modifications)
- G. 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 should be made by comparing observable/measurable physical characteristics with those provided in reference 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. Igniters containing EMs should be protected from sources of heat, impact, shock, and friction. Should they be initiated accidentally, they have the capability of inflicting personal injury and property damage; therefore, they should be handled with care. Personnel should follow the below guidance regarding the handling of igniters:
 1. Igniters should be stored in approved containers (i.e., static proof or static-dissipative plastic bags) when not under examination.

2. Appropriate facial protection (e.g., eye protection, full face shield) should be worn when handling intact igniters.
 3. Igniter leg wires should be shunted to prevent static electricity or extraneous current initiating it.
 4. Igniter leg wires should not be placed where they could come in contact with a source of current unless the igniter is being purposely initiated as part of an examination.
 5. Intact igniters and other types of EMs and components should not be examined at the same time or placed close to each other.
- C. 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	08/15/2022	Updated to new document template and updates made throughout for clarity.