Pipe Nipple / Tube Examinations

1 Scope

These procedures describe the process for pipe nipple/tube examinations and apply to explosives and hazardous devices caseworking personnel who examine pipe nipples/tubes and their post-blast remains to determine identifying and functionality information.

2 Introduction

Pipes, tubes and related fittings (e.g., end caps, plugs) are utilized to carry liquids from one location to another. They are commonly made from either metal or plastic. Pipes, tubes and fittings can be identified as being manufactured by a specific manufacturer and type, from its manufacturer's identification markings and/or examination of its construction characteristics.

Pipes, tubes, and related fittings are frequently utilized in the fabrication of improvised explosive devices (IEDs) as the container for the main charge explosive. In addition to being a container, the materials become hazardous fragmentation upon the initiation and explosion of the main charge explosive.

The examination and identification of pipes, tubes and fittings assists the investigator in efforts to identify the person(s) and/or group responsible for fabricating the explosive device.

3 Equipment/Material/Reagents

Below is a list of items that can be used to examine pipe nipples, tubes, 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 ruler)
- Micrometer
- Caliper
- 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). Refer to the Safety section of this SOP before starting any examinations.

Explosives and hazardous devices personnel will:

6.1 Before any examination is conducted, ensure that the container 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 item(s), or obliterate any microscopic marks of value.

6.3 Visually examine the item(s) for any trace evidence that could be of value. This evidence could include, but not limited to the following: unconsumed explosives, 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 pipe/tube/fittings through visual/microscopic examination. Physical measurements should be taken to aid in determining as many of the following attributes as possible:

- Construction characteristics
- Manufacturer
- Brand
- Type of component(s)
- Special properties (e.g., fragmented, modifications made for used 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 will be made by comparing of observable/measurable physical

characteristics with those provided in the above reference/literature materials.

6.6 Microscopically examine the pipe, tube and/or the pipe fittings to determine if there are individual microscopic marks of value for comparison/identification purposes.

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, should be observed at all times.

10.1 Fragmented metal components have sharp edges. Therefore, puncture resistant gloves should be worn when handling these items.

10.2 Protective gloves (e.g., latex, nitrile) must be worn when handling items that have been possibly exposed to blood, tissue or other bodily fluids. Gloves will prevent exposure to possible hazardous material on the items and prevent DNA from being transferred to the items.

10.3 Items potentially containing blood or other body fluids will be disinfected with a 2.5% bleach solution or other suitable disinfectant following the 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

Beveridge, A., Forensic Investigation of Explosions, 2nd Edition, CRC Press, 2012

Industrial Press, Machinery's Handbook, 28th Edition, 2008

Oxley, J.C., et al., Improvised Explosive Devices: Pipe Bombs, J. Forensic Sci, 2001, 46(3), 510 – 534

Thurman, J.T., Practical Bomb Scene Investigation, 2nd Edition, CRC Press, 2011

Rev. #	Issue Date	History
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 no longer 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.

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Approval

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