

# Pipe Nipple Tube Examinations

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## 1 INTRODUCTION

Pipe and tubing, hereafter referred to as pipe, are commercially available, tubular items used to contain substances such as fluid or gas and allow it to flow from one location to another. It is used in the industrial sector in areas such as plumbing, HVAC, food, chemical, power, and refinery. Pipe is commonly made of metal or plastic and is manufactured to withstand a specific design pressure at a given temperature.

Pipe can be used in improvised explosive devices (IEDs) and improvised incendiary devices (IIDs), hereafter referred to as devices, to contain the main charge energetic material (EM). These devices are commonly referred to as pipe bombs. The chemical reaction of the main charge generates gases that exert high pressures on the interior walls of the pipe. If the pressure overcomes the design pressure of the pipe, it can violently rupture, causing the gases to escape and pipe fragmentation to be projected outwards at high velocities. Examination of pipes, pipe-related fittings, or their fragmented remains can sometimes assist in determining their functionality within a device and provide manufacturing information. This information can assist the investigator in identifying the subject(s) responsible for constructing the device.

## 2 SCOPE

These procedures describe the process for pipe and pipe-related fittings examinations and apply to explosives and hazardous devices personnel who examine them and their post-use remains to determine identifying and functionality information.

## 3 EQUIPMENT

Below is a list of items that can be used to examine pipe, pipe-related fittings, and their post-use 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, face shield, 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., 12-inch length)
- Micrometer
- Caliper
- Containers (e.g., boxes, pillboxes, glass/plastic/metal containers, plastic/paper bags, static-proof/dissipative plastic bags)
- FBI Laboratory Explosives Reference Tool (EXPeRT) database
- Reference texts, manuals, manufacturers' literature, and reference items 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. Ensure that all evidentiary items, their containers, and packaging have been marked in accordance with the [FBI Laboratory Operations Manual \(LOM\)](#) (i.e., item number, initials, and Laboratory Number, when practicable) before beginning examinations.
- B. Take precautions to not obliterate any marks of value on the items. Record the presence of such marks through notes, sketches, and photographs.
- C. Take photographs of the items prior to disassembly to aid documentation and device reconstruction.
- D. Visually examine the items for evidence such as fingerprints, hairs, fibers, blood, paint, or other particles.
  - o If 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 removal.
- E. Note the physical characteristics of the items through visual/microscopic examinations. 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 Special properties (e.g., physical condition, functionality, modifications)
- F. Attempt to determine identifying information by searching the EXPeRT database, reference materials, and manufacturers' literature. Identifications and associations are made by comparison of observable and measurable physical characteristics with those provided in the above 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 outlined in the [FBI Laboratory Safety Manual](#) will be observed.

- A. Protective gloves (e.g., latex, nitrile, etc.,) will be worn when handling evidence.
  1. Appropriate gloves should be worn for protection against the sharp edges associated with the fragmented remains of some items.
- B. Items containing EMs should be protected from sources of heat, impact, shock, friction, and electrostatic discharge (ESD). Should they be accidentally initiated, they

- have the capability of inflicting personal injury or property damage and should be handled with care.
- C. Items containing EMs will be stored in approved, explosion-proof containers (e.g., explosive magazines, MK663 containers, as appropriate) when not being examined.
  - D. Items containing more than one (1) pound (454 grams) of EM will not be accepted for examination in the Laboratory.
    - 1. Extra EM with a mass of greater than one (1) pound (454 grams) will be properly stored in approved, explosion-proof containers (e.g., explosives magazines, MK663 containers, as appropriate).
    - 2. Examinations of items containing more than one (1) pound (454 grams) of EMs will be conducted at an appropriate, remote location such as an explosives demolition range.
  - E. Live items can be rendered safe, or inert, by using specialized equipment at an appropriate location such as an explosives demolition range.
    - 1. Inert items should be marked as such.
    - 2. Consult with military and/or Department of Defense (DOD) personnel, as appropriate.
  - F. Items containing EMs will be shipped in approved containers, as appropriate.
  - G. Facial protection will be worn when handling items containing EMs, as appropriate.
  - H. An item containing EMs will not be examined at the same time as, or placed close to, other EMs or explosives-related components.
  - I. 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	09/15/2022	Updated to new document template and updates made throughout for clarity.