

	FAPM 3.0 Physical Examination & Classification of Fired Cartridge Cases	
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	Document Manager: Andrew Carriveau	Approved By: Jeffrey Nye

3.0 Physical Examination & Classification of Fired Cartridge Cases

3.1 Introduction

The initial examination of any fired cartridge case evidence will include the completion of a worksheet in Forensic Advantage. These worksheets will include the physical description of the fired cartridge case and will serve as a source to document the condition of the evidence as received and any tests or comparisons performed.

3.2 Safety Considerations

Examinations performed in the Firearm and Toolmark Section are inherently hazardous. These procedures involve hazardous chemicals, firearms, ammunition, and power tools. All hazardous procedures must be performed in compliance with the Laboratory Operations Manual and the Health and Safety Manual.

3.3 Preparation of Cleaning Solution

3.3.1 Bleach Solution

- Prepare a Bleach Solution as needed by combining 10 milliliters of bleach to 90 milliliters of distilled water
- Discard after use.

3.4 Instrumentation

- Comparison Microscope
- Stereo Microscope
- Micrometer/Caliper

3.5 Minimum Analytical Standards and Controls

[Appendix A Calibration Standards](#)

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3.6 Procedure or Analysis

The evidence will be marked in accordance with the [Laboratory Operations Manual Section 4.3](#). A systematic approach should be used for the physical examination and classification of fired cartridge cases, with recording of findings and observations in notes.

Items that have been processed by the MSP Biology Units are typically given item numbers/identifiers that contain the lab number and subsequent identifier unique to that item. For ease of documentation and review, all firearms personnel may omit the preceding lab number and use the subsequent unique identifier. The preceding lab number of an item shall not be omitted if doing so creates a duplicate item number. If the preceding lab number is omitted from items in the results section of the lab report, a notation should be made at the end of the report stating as much.

3.6.1 General, Visual, Physical and Trace Examinations

The initial examination of any cartridge case will include a worksheet.

Examine the cartridge case visually and microscopically for any trace material. Determine if further examination of the material is necessary and consult the appropriate section prior to the removal of the material. Document findings and observations and record in the notes.

Once the cartridge case has been examined for the presence of pertinent trace evidence material, visual and physical examinations are conducted to determine the following features, to be documented on the worksheet in Forensic Advantage:

- Presence or absence of trace material
- Caliber
- The possible manufacturer/marketer of the cartridge case (Forensic Ammunition Service Centerfire Headstamp Guide 2010 Version, CartWinPro 3.5 or another database)
- Ignition system - centerfire, rimfire, other
- Description of metal used in cartridge case and primer
- Description of headstamp. If the headstamp contains a symbol, resources such as CartWin Pro and the AFTE Headstamp Guide as well as other online resources may be used to identify the symbol's definition or meaning.
- Description of firing pin impression
- If the Ammunition Reference Collection is used, the unique identifier of the sample shall be listed in the Notes section of the worksheet
 - Refer to [LOM 2.5.1, 2 and 3](#) for specific maintenance requirements of reference collection standards.
 - [AR 3125 6.4.3.2](#) and [ISO 17025:2017 6.4.13\(f\)](#)

3.6.2 Trace Material Examination

Evidence recovered during an investigation may contain trace material transferred from the crime scene. This material may be in the form of blood, tissue, plaster, paint, hairs, fibers, glass, etc. Removal and/or preservation of this material may be necessary to allow a complete examination of the evidence

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3.6.3 Caliber Determination

Caliber can usually be determined by examination of the headstamp of the cartridge case and is written as a numerical term that may be depicted with or without a decimal point. If it is not legible on the headstamp, the cartridge case can be compared with laboratory standards, available manufacturer literature or other available resources.

3.6.4 Examination of Marks

Visual and microscopic marks are imparted on ammunition components during discharge and at times as a result of cycling the action of a firearm. An examination and comparison of the class and microscopic characteristics is necessary for a possible determination of origin.

3.6.5 Interpretation of Results

- May determine caliber and brand/manufacturer/marketer of cartridge case
- May determine if there are suitable markings for identification with a firearm or with other fired components
- May determine possible firearms that could have fired cartridge case
- May be able to identify the firearm in which it was fired
- Record interpretation of results in the notes

3.7 Appendices

[Appendix A - Calibration Standards](#)

3.8 References

[Association of Firearm and Toolmark Examiners Glossary, 6th ed. 2017](#)

Howe, Walter J. "Laboratory Work Sheets" AFTE Newsletter No. 2, August 1969, p. 13
<http://www.afte.org>