

Standard Method for the Examination and Documentation of Ammunition and Ammunition Components

*Firearms and Toolmarks Subcommittee
Physics/Pattern Interpretation Scientific Area Committee
Organization of Scientific Area Committees (OSAC) for Forensic Science*



OSAC Proposed Standard

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Prepared by
Firearms & Toolmarks Subcommittee
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Disclaimer:

This document has been developed by the Firearms & Toolmarks Subcommittee of the Organization of Scientific Area Committees (OSAC) for Forensic Science through a consensus process and is *proposed* for further development through a Standard Developing Organization (SDO). This document is being made available so that the forensic science community and interested parties can consider the recommendations of the OSAC pertaining to applicable forensic science practices. The document was developed with input from experts in a broad array of forensic science disciplines as well as scientific research, measurement science, statistics, law, and policy.

This document has not been published by a SDO. Its contents are subject to change during the standards development process. All interested groups or individuals are strongly encouraged to submit comments on this proposed document during the open comment period administered by the Academy Standards Board (<http://www.asbstandardsboard.org/>).

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This document provides procedures for the initial examination and documentation of ammunition and ammunition components by a forensic firearm and toolmark examiner or technician.

Foreword

This standard test method document was proposed by the Firearms and Toolmarks Subcommittee of the Organization of Scientific Area Committees (OSAC) by submitting a request to the American Academy of Forensic Sciences (AAFS) Academy Standards Board (ASB). This document is intended to provide procedures for the examination and documentation of evidence ammunition and/or ammunition components by forensic firearm and toolmark examiners or technicians.

Depending on the intended use of the information provided by the examination, differing levels of examination may be required. Laboratory policy may inform examiners/technicians as to which steps in the process are appropriate.



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1 Scope

This standard provides procedures for the examination and documentation of ammunition and/or ammunition components by forensic firearm and toolmark examiners or technicians. Following these procedures, an examiner or technician will be able to document and report the examination of ammunition and/or ammunition components. This document does not cover the microscopic comparison of toolmarks on ammunition components.

2 Normative References

None

3 Terms and Definitions

None

4 Requirements

4.1 Equipment and Materials

Caliper/Micrometer

Camera

Engraver or scribe

Personal protective equipment

Scale/Balance

Stereo microscope and/or comparison microscope

Various light sources suitable for the examination of ammunition and/or ammunition components

Various tools necessary for disassembly of ammunition. Some of these may be specialty tools.

4.2 Test Preparations

4.2.1 Use appropriate personal protective equipment when handling evidence contaminated with chemical and/or biological hazards.

4.2.2 Refer to *Best Practice Recommendations for the Safe Handling of Firearms and Ammunition*.

4.3 Documentation

4.3.1 Document the examination. Acceptable forms of documentation include, but are not limited to, worksheets, laboratory notes, sketches, photographs, or a combination thereof. Documentation shall be prepared contemporaneous with the examination.

4.4 Evidence Handling

4.4.1 Document the condition of the evidence packaging as received and mark the packaging in accordance with laboratory protocols.

4.4.2 Mark the evidence for identification in accordance with laboratory protocols. Care should always be taken to ensure no markings interfere with or damage areas of interest, such as those that bear toolmarks suitable for comparison.

4.5 Initial Examination

4.5.1 Conduct a preliminary examination of the ammunition and/or ammunition components and document the condition as received. If severely damaged, no further examination may be possible. For items that are suitable for further examination, proceed with the steps in section 4.6 that are appropriate to the item type.

4.5.2 Document the presence of any foreign or trace material adhering to the ammunition / ammunition components. Collect and preserve any pertinent material in accordance with laboratory policy.

4.6 Physical Examination and Documentation

4.6.1 Unfired Ammunition

Document the unfired ammunition to include the following, as appropriate:

- Caliber/gauge
- Manufacturer/marketer
- Ignition system (centerfire, rimfire, etc.)
- Composition and/or finish of the cartridge case, shotshell, primer, and/or bullet
- Bullet/projectile design (round nose, hollow point, etc.)
- Information printed on shotshells
- Headstamp
- Any observable toolmarks from cycling (magazine marks, extractor/ejector marks, etc.), partial firing pin impressions, etc.
- Any observable toolmarks from the manufacturing process that could be mistaken for toolmarks created by a firearm (striated marks on primer, impressions on the head of the cartridge case, etc.)
- Damage

4.6.2 Fired Cartridge Cases

Document the fired cartridge case(s) to include the following, as appropriate:

- Caliber
- Manufacturer/marketer
- Ignition system (centerfire, rimfire, etc.)
- Composition and/or finish of the cartridge case and primer
- Headstamp
- Any observable toolmarks from cycling or firing (firing pin impression, breech face marks, extractor/ejector mark(s), chamber marks, anvil marks, magazine marks, ejection port marks, etc.)
- Any observable toolmarks from loading/reloading (resizing marks, etc.)
- Class characteristics present within the firing pin and breech face marks
- Damage

4.6.3 Fired Shotshell Cases

Document the fired shotshell case(s) to include the following, as appropriate:

- Gauge/Bore/Caliber
- Manufacturer/marketer
- Ignition system (centerfire, rimfire, etc.)
- Length
- Composition and/or finish of shotshell case, battery cup, and primer
- Information printed on shotshell case
- Headstamp
- Any observable toolmarks from cycling or firing (firing pin impression, breech face marks, extractor/ejector mark(s), chamber marks, shell stop/latch marks, ejection port marks, etc.)
- Any observable toolmarks from loading/reloading (resizing marks, etc.)
- Class characteristics present within the firing pin and breech face marks
- Damage

4.6.4 Fired Bullets/Projectiles

Document the fired bullet(s)/projectile(s) (e.g. shotshell components) to include the following, as appropriate:

- Diameter
- Projectile weight
- Number of land and groove impressions observed
- Direction of twist
- Land impression width(s)
- Groove impression width(s)
- Composition (core material, jacket material, etc.)
- Bullet/projectile design (round nose, hollow point, etc.)
- Characteristics of base

- Manufacturer/marketer
- Number and type of cannelures
- Damage
- Presence of foreign material (e.g. bone, paint, sheetrock, etc.)

4.7

Test Reports

The test report shall include a description of any ammunition and/or ammunition components that are examined, as appropriate. Information included in a test report may be limited by the quality of the evidence.

Annex A
(informative)

Foundational Principles

A.1 General

The standard outlined in this document is grounded in the generally accepted body of knowledge and experience in the field of firearm and toolmark examination.

Annex B
(informative)

Bibliography

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