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



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

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Foreword

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

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.

This document was revised, prepared, and finalized as a standard by the Firearms and Toolmarks Consensus Body of the AAFS Standards Board. The draft of this standard was developed by the Firearms and Toolmarks Subcommittee of the Organization of Scientific Area Committees (OSAC) for Forensic Science.

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All hyperlinks and web addresses shown in this document are current as of the publication date of this standard.

Keywords: *Ammunition, ammunition components, bullet, cartridge, cartridge case, shotshell, physical examination.*

Table of Contents

1	Scope.....
2	Normative References.....
3	Terms and Definitions.....
4	Requirements.....
4.1	Equipment and Materials.....
4.2	Test Preparations.....
4.3	Documentation.....
4.4	Evidence Handling.....
4.5	Initial Examination.....
4.6	Physical Examination and Documentation.....
4.7	Test Reports.....
	Annex A (informative) Bibliography.....

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

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

There are no normative reference documents. Annex A, Bibliography, contains informative references.

3 Terms and Definitions

There are no terms and definitions in this document.

4 Requirements

4.1 Equipment and Materials

The following equipment and materials are often used in examinations:

- a) caliper/micrometer;
- b) camera;
- c) engraver or scribe;
- d) personal protective equipment;
- e) scale/balance;
- f) stereo microscope and/or comparison microscope;
- g) various light sources suitable for the examination of ammunition and/or ammunition components; and
- h) various tools necessary for disassembly of ammunition. Some of these may be specialty tools.

4.2 Test Preparations

4.2.1 Laboratories shall ensure all personnel handling firearms and ammunition are properly trained or have protocols for collaborative evidence collection with properly trained personnel.

4.2.2 The examiner shall use appropriate personal protective equipment when handling evidence contaminated with chemical and/or biological hazards.

4.3 Documentation

The examination shall be documented. 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 The examiner shall document the condition of the evidence packaging as received and mark the packaging in accordance with laboratory protocols.

4.4.2 The examiner shall, where practicable, mark the evidence for identification in accordance with laboratory protocols. Identification markings shall not interfere with or damage areas of interest, such as those that bear toolmarks suitable for comparison.

4.5 Initial Examination

4.5.1 The examiner shall 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 The examiner shall 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.

4.5.3 If necessary, the ammunition/ammunition components may be cleaned.

4.6 Physical Examination and Documentation

4.6.1 Unfired Ammunition

The examiner shall document the unfired ammunition. The documentation may 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 (if necessary to establish shot type and shot size, disassembly of the shotshell may be required);

- 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.);
- any observable toolmarks from loading/reloading (resizing marks, etc.); and
- damage.

4.6.2 Fired Cartridge Cases

The examiner shall document fired cartridge cases. The documentation may 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; and
- damage.

4.6.3 Fired Shotshell Cases

The examiner shall document fired shotshell cases. The documentation may 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; and
- damage.

4.6.4 Fired Bullets/Projectiles

The examiner shall document fired bullets/projectiles (e.g., shotshell components). The documentation may 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, shot material, etc.);
- bullet/projectile design (round nose, hollow point, etc.);
- characteristics of base;
- manufacturer/marketer;
- number and type of cannellures;
- damage; and
- 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.

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Annex A (informative)

Bibliography

This is not meant to be an all-inclusive list as the group recognizes other publications on this subject may exist. At the time this standard was drafted, these were the publications utilized for reference. Additionally, any mention of a particular software tool or vendor as part of this bibliography is purely incidental, and any inclusion does not imply endorsement.

- 1] ASB Standard 068, *Safe Handling of Firearms and Ammunition*. First Edition xxxx. *To be published*.
- 2] The Sporting Arms and Ammunition Manufacturers' Institute (SAAMI). *Glossary*¹.

SWGgun documents can be downloaded from:

https://www.nist.gov/system/files/documents/2016/11/28/guidelines_for_documentation_of_the_examination_of_ammunition_and_ammunition_components.pdf

¹ Available from <https://saami.org/saami-glossary/>.

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