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



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

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## Foreword

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 is intended to provide procedures for the initial examination of ammunition and ammunition components by a firearm and toolmark examiner or technician. It also provides procedures for the documentation of these examinations.

The American Academy of Forensic Sciences established the Academy Standards Board (ASB) in 2015 with a vision of safeguarding Justice, Integrity and Fairness through Consensus Based American National Standards. To that end, the ASB develops consensus based forensic standards within a framework accredited by the American National Standards Institute (ANSI), and provides training to support those standards. ASB values integrity, scientific rigor, openness, due process, collaboration, excellence, diversity and inclusion. ASB is dedicated to developing and making freely accessible the highest quality documentary forensic science consensus Standards, Guidelines, Best Practices, and Technical Reports in a wide range of forensic science disciplines as a service to forensic practitioners and the legal system.

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.

Questions, comments, and suggestions for the improvement of this document can be sent to AAFS-ASB Secretariat, [asb@aafs.org](mailto:asb@aafs.org) or 401 N 21<sup>st</sup> Street, Colorado Springs, CO 80904.

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

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

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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

For purposes of this document, the following definitions apply.

### 3.1

#### **test report**

A term intended to encompass any report containing the description of items submitted to a laboratory, as well as any results of testing and examinations that may have occurred.

## 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 trained and have protocols for collaborative evidence collection. The examiner should consider, based on provided information and their initial examination, whether steps should be taken to preserve potential biological, trace, latent print, or other transient evidence found on these items.

**4.2.2** The examiner shall use appropriate personal protective equipment when handling evidence contaminated with chemical and/or biological hazards. Please refer to ANSI/ASB Best Practice Recommendation 068: *Safe Handling of Firearms and Ammunition*<sup>1</sup> for information regarding the safe handling of the firearms and ammunition.

## 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. The documentation shall be such that another firearm and toolmark examiner could evaluate what was done and interpret the data.

## 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.

**4.4.3** If it is not practicable to mark the item, the identifying information shall be placed on the most proximal container for that item.

## 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. If necessary, the examiner shall collect and preserve any such material in accordance with laboratory policy.

**4.5.3** If necessary, the ammunition/ammunition components may be cleaned. The examiner shall document the cleaning.

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<sup>1</sup> Available from: <https://www.aafs.org/academy-standards-board>

## **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:

- headstamp;
- 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);
- 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 Ammunition Packaging**

The examiner shall document commercial packaging. The documentation may include the following, as appropriate:

- brand;
- manufacturer/marketer;
- ammunition description as printed on package;
- product code/SKU;
- lot number;
- package capacity.

### 4.6.3 Fired Cartridge Cases

The examiner shall document fired cartridge cases. The documentation may include the following, as appropriate:

- headstamp;
- caliber;
- manufacturer/marketer;
- ignition system (centerfire, rimfire, etc.);
- composition and/or finish of the cartridge case and primer;
- 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 (including indications of mismatched or improper ammunition used with a firearm).

### 4.6.4 Fired Shotshell Cases

The examiner shall document fired shotshell cases. The documentation may include the following, as appropriate:

- headstamp;
- information printed on shotshell case;
- gauge/bore/caliber;
- manufacturer/marketer;
- ignition system (centerfire, rimfire, etc.);
- length;
- composition and/or finish of shotshell case, battery cup, and primer;
- 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 (including indications of mismatched or improper ammunition used with a firearm).

#### **4.6.5 Fired Bullets/Projectiles**

The examiner shall document the apparent characteristics of fired bullets/projectiles (e.g., shotshell components). The documentation should include whether the characteristics are descriptive observations or based on analytical tests. The documentation may include the following, as appropriate:

- diameter;
- projectile weight;
- number of land and groove impressions discernable;
- 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 cannelures;
- damage (including indications of mismatched or improper ammunition used with a firearm);  
and
- presence of foreign material (possible biological material, paint, sheetrock, etc.).

#### **4.7 Test Reports**

The test report shall summarize the documentation of the items as set forth in this standard. Information included in a test report may be limited by the quality of the evidence.

## **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] ANSI/ASB Standard 068, *Safe Handling of Firearms and Ammunition*. First Edition 2020<sup>2</sup>.
- 2] The Sporting Arms and Ammunition Manufacturers' Institute (SAAMI). *Glossary*<sup>3</sup>.

**SWGUN 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](https://www.nist.gov/system/files/documents/2016/11/28/guidelines_for_documentation_of_the_examination_of_ammunition_and_ammunition_components.pdf)

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<sup>2</sup> Available from: <https://www.aafs.org/academy-standards-board>

<sup>3</sup> Available from <https://saami.org/saami-glossary/>.



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