

2024 MICROSTAMPING VIABILITY Report

State of New Jersey
Office of the Attorney General



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Introduction

In 2022, Governor Murphy signed L. 2022, c. 57 (codified at N.J.S.A. 2C:58-2.13 to 2.15, 52:17B-4.4a; hereinafter, the “Microstamping Act”)—a law designed to promote the commercial development and sale of microstamping-enabled firearms in the State of New Jersey.

Microstamping is a ballistics identification technology designed to enable law enforcement to more easily link expended cartridge cases¹ found at crime scenes to other such cartridges and to the firearm from which they were discharged. Generally, the technology involves engraving a gun’s firing pin with an identifying mark, such as numbers, letters, or geometric shapes. Subsequently, when the gun containing the engraved firing pin fires a round, such firing pin will impart an imprint of the engraving onto the cartridge case expended from the firearm.

Relying on data that associates each engraving with a specific firearm—that is, to a particular make, model, and serial number—a forensic examiner can readily link expended cartridge cases bearing a microstamping imprint to the specific firearm from which the cartridge case was discharged, regardless of whether the firearm was itself recovered.

The Microstamping Act directs the Attorney General to, among other things, “complete an investigation concerning the technological viability of microstamping-enabled firearms.”² That investigation “shall include, but need not be limited to, live fire testing evidence.”³ The Act directs the Attorney General at the conclusion of the investigation to “certify whether viable microstamping-enabled technology exists.”⁴

The Attorney General has designated the Statewide Affirmative Firearms Enforcement (SAFE) Office to conduct this statutorily-required investigation into the technological viability of microstamping-enabled firearms.⁵ As discussed further below, SAFE’s investigation focused on

¹ A cartridge case is the component of firearm ammunition, usually made of brass, that holds the primer, powder, and bullet. The primer, in turn, is a percussion-sensitive chemical mixture contained in the base of a cartridge. The primer explodes when struck by the firing pin, igniting the powder and propelling the bullet forward. Upon such firing, the cartridge case no longer contains its component parts and is expelled from the firearm. See *Firearms – Guides – Importation & Verification of Firearms – Gun Control Act Definition – Ammunition*, BUREAU OF ALCOHOL, TOBACCO, FIREARMS AND EXPLOSIVES, Apr. 18, 2018, <https://www.atf.gov/firearms/firearms-guides-importation-verification-firearms-gun-control-act-definition-ammunition>.

² N.J.S.A. 2C:58-2.13(b)(2).

³ *Id.*

⁴ *Id.*

⁵ The Attorney General established the SAFE Office in 2022 through A.G. Directive No. 2022-08. The Directive delegated to SAFE “[a]ll functions, powers, and duties vested in the Attorney General by L. 2022, c. 56.” The Directive also provided that the SAFE Office shall, “under the authority and supervision of the Attorney General . . .

the specific question of whether technology exists that can impart a readily associable mark on an expended cartridge case with regularity, including after sustained firing. This report summarizes SAFE's factual findings and provides a recommendation to the Attorney General regarding whether to certify that viable microstamping-enabled technology exists. This report has been prepared solely for the Attorney General's benefit, and is not to be construed to provide or establish any benefit to third parties.

Statutory Background and Scope of Investigation

A. Statutory Background

The Microstamping Act aims to facilitate the development and sale of microstamping-enabled firearms in the State of New Jersey. The Attorney General is responsible for implementing the Act, and must take certain steps at the outset:

- 1. Performance Standards & Qualification Process:** The Attorney General shall “develop performance standards and qualifying criteria for determining whether a firearm constitutes a microstamping-enabled firearm,” and “establish a process by which to determine whether a firearm constitutes a microstamping-enabled firearm.”⁶
- 2. Viability Investigation:** “Based on the standards, criteria, and process established,” the Attorney General shall “complete an investigation concerning the technological viability of microstamping-enabled firearms.”⁷ That investigation “shall include, but need not be limited to, live-fire testing evidence.”⁸ At the conclusion of the investigation, the Attorney General “shall certify whether viable microstamping technology exists.”⁹

The Act also provides that “the Attorney General . . . shall designate a microstamping examiner,” who is responsible for examining firearms for possible inclusion on a “Microstamp Roster.”¹⁰ The Attorney General has designated SAFE Senior Investigator Reinaldo Roldan as Microstamping Examiner. Mr. Roldan, an Army veteran, previously worked for the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) for twenty-three years, retiring as a senior Special Agent in the agency's Newark Field Division. During his service with the ATF, he

coordinate with every other division, agency, office, commission, bureau, and unit within the Department [of Law and Public Safety] to facilitate the efficient and effective administration of laws pertaining to gun violence.”

⁶ N.J.S.A. 2C:58-2.13(b)(1).

⁷ N.J.S.A. 2C:58-2.13(b)(2).

⁸ *Id.*

⁹ *Id.*

¹⁰ N.J.S.A. 2C:58-2.13(c), (d).

investigated all manner of gun-related crimes, including international firearms trafficking, and was the supervisory Special Agent of the Crime Gun Intelligence Center for the New York ATF office. Mr. Roldan served as the testing coordinator for this investigation.

Once the above steps are completed, “any person seeking to include a firearm on the microstamping roster may apply to the microstamping examiner for a determination of whether the make and model of firearm proposed by the applicant may be designated as a microstamping-enabled firearm.”¹¹ The Microstamping Examiner “shall examine firearms submitted” by an applicant, and thereupon “determine whether [the] firearm meets the performance standards and qualifying criteria established by the Attorney General to be designated as a microstamping-enabled firearm.”¹² If the Attorney General’s prior investigation and certification concerning microstamping technology “certifie[d] that the technology does not exist,” then the Microstamping Examiner will also “make technological viability certification recommendations to the Attorney General until such time as the Attorney General certifies that microstamping-enabled firearms are technologically viable.”¹³

On August 22, 2023, the Attorney General issued Performance Standards and Qualifying Criteria for the microstamping examiner to use in examining applicant-proposed firearms, which a particular firearm model must meet in order to be designated as a microstamping-enabled firearm and be included on the Microstamp Roster.¹⁴ The Attorney General also established the Process for Determination of Microstamping-Enabled Firearms, which sets forth procedures to govern the application process for inclusion on the Roster and the microstamping examiner’s review. Both are included here as Appendix A.

Under the Attorney General’s Performance Standards and Qualifying Criteria, for a firearm model to qualify for the Microstamp Roster, the Microstamping Examiner must determine that the firearm model has the following attributes:

1. When the firearm fires a round, it shall impart an imprint, etching, stamp, or other marker onto the expended cartridge case that is readily associable by law

¹¹ N.J.S.A. 2C:58-2.13(e).

¹² N.J.S.A. 2C:58-2.13(c).

¹³ N.J.S.A. 2C:58-2.13(b)(2), (c). The Act further provides that, upon inclusion of a firearm model on the Microstamp Roster and certification by the Attorney General that such firearms are commercially available, licensed firearms dealers must make at least one firearm from the Roster available for purchase. N.J.S.A. 2C:58-2.13(f). Purchasers of firearms from the Roster are eligible for an instant rebate of ten percent of the purchase price up to a maximum of \$30. N.J.S.A. 2C:58-2.15.

¹⁴ *Microstamping Performance Standards and Qualifying Criteria*, N.J. Office of the Attorney General, Aug. 22, 2023, https://www.nj.gov/oag/newsreleases23/2023-0822_Microstamping-Standards-and-Testing.pdf; see also Press Release, *AG Platkin Announces Adoption of Standards and Processes for Microstamping-Enabled Firearms Roster*, N.J. OFFICE OF THE ATTORNEY GENERAL, Aug. 22, 2023, <https://www.njoag.gov/ag-platkin-announces-adoption-of-standards-and-processes-for-microstamping-enabled-firearms-roster>.

enforcement and other governmental authorities with the specific firearm from which the cartridge case was expended.

2. The firearm must impart such a marker regularly, including after sustained firing of the firearm.
3. The firearm shall not physically deform or deteriorate as a result of firing rounds, and shall not fire with less reliability than other commercial firearms sold in New Jersey.
4. The firearm shall not discharge in response to abuse or mishandling of the firearm.
5. The firearm's design shall comply with all applicable New Jersey and federal laws.
6. The firearm shall be made by a manufacturer possessing all licenses required by law for such manufacturers.
7. The firearm shall be submitted for application by the manufacturer or its authorized distributor or dealer, or otherwise with the consent of the manufacturer or authorized distributor or dealer.

B. Scope of Technological Viability Investigation

The Attorney General designated the SAFE Office to “complete an investigation concerning the technological viability of microstamping-enabled firearms” in accordance with N.J.S.A. 2C:58-2.13(b). The Attorney General further requested that the SAFE Office make a recommendation with respect to certifying whether viable microstamping-enabled technology exists.¹⁵

The Microstamping Act provides that the statutorily mandated technological viability investigation is to be “based on the standards, criteria, and process” that the Attorney General established for the inclusion of particular firearm makes and models on the Microstamp Roster. Two of the Attorney General's Performance Standards and Qualifying Criteria concern the performance of microstamping technology itself, and thus pertain to the technology's viability. These are:

1. When the firearm fires a round, it shall impart an imprint, etching, stamp, or other marker onto the expended cartridge case that is readily associable by law enforcement and other governmental authorities with the specific firearm from which the cartridge case was expended; and
2. The firearm must impart such a marker regularly, including after sustained firing of the weapon.

¹⁵ N.J.S.A. 2C:58-2.13(1)(b)(2).

The remainder of the Attorney General’s Performance Standards and Qualifying Criteria concern qualifications that do not relate to the functioning of the microstamping technology itself and are therefore outside the scope of the assessment of technological viability. In particular, criteria (3) and (4) relate to the reliability of an applicant-proposed firearm separate from the performance of the microstamping mechanism; criteria (5) and (6) relate to legal compliance requirements that an applicant-proposed firearm model and its manufacturer must meet for inclusion on the Roster; and criterion (7) relates to the identity of the person authorized to submit an application for inclusion of a firearm model in the Roster. Each of these additional qualifications is better suited for consideration in the context of specific applications to include particular microstamping-enabled firearm models on the Roster.¹⁶ And under the Microstamping Act, even after the Attorney General certifies that viable microstamping technology exists, the Microstamping Examiner must nevertheless determine that any applicant-proposed firearm model itself satisfies each and every performance standard and qualifying criterion prior to determining that the firearm model qualifies for inclusion on the Roster.

Based on these considerations, SAFE’s investigation sought to determine whether microstamping technology exists that can impart a readily associable mark on an expended cartridge case with regularity, including after sustained firing. The scope of this investigation was limited to this question.

Factual Findings

A. Background on Microstamping Technology

Whenever a semiautomatic pistol fires a round, it imparts microscopic markings on the spent cartridge case. These markings can generate a distinctive pattern and are therefore used for ballistics analysis. With thorough and detailed visual examination conducted through microscopic magnification, trained forensics examiners use such markings to differentiate or associate multiple cartridge cases found at a particular crime scene; to link cartridge cases recovered at different crime scenes; and to associate cartridge cases recovered from crime scenes with particular firearms recovered by law enforcement.¹⁷

Microstamping technology has the potential to enhance this kind of ballistics analysis by imparting intentional markings that are more readily identifiable and associable than the

¹⁶ Likewise, no part of the Attorney General’s Process for Determination of Microstamping-Enabled Firearms sets standards for microstamping technology performance.

¹⁷ For a history of the forensic examination of microscopic markings on spent cartridge cases, see JOE NICKELL & JOHN F. FISCHER, *CRIME SCIENCE: METHODS OF FORENSIC DETECTION* (1999). For a discussion and history of how spent cases are associated to firearms, see James E. Hamby et al., *The Identification of Bullets Fired from 10 Consecutively Rifled 9mm Ruger Pistol Barrels: A Research Project Involving 507 Participants from 20 Countries*, 41 *ASS’N FIREARM & TOOL MARK EXAMINERS J.* 99 (2009).

incidental markings that forensics examiners otherwise rely upon. To achieve this, technology developers have proposed using lasers to engrave a gun's firing pin with unique letters, symbols, or designs. The technology may enable examiners to associate expended cartridges with microstamp-enabled firearms that have not been recovered by law enforcement, as long as law enforcement has access to information that associates information engraved on the microstamp with the corresponding firearm's make and serial number.¹⁸

Co-inventors Todd Lizotte and Orest Ohar created a process for microstamping in the 1990s after developing microidentification and micromachining technologies for the electronics and computer industries. Lizotte and Ohar applied this technology to firearms by using lasers to etch characters onto the firing pin of a handgun.¹⁹ In the mid-2000s, they secured a series of patents (now in the public domain) for Intentional Firearm Microstamping.²⁰ Lizotte is currently the owner of BOLD Laser Automation and president and CEO of TACLABS, Inc.

B. Live-Fire Testing

Overview

Public information about microstamping technology and academic examinations of microstamping-enabled firearms indicated that TACLABS and its president and CEO, Lizotte, likely possessed a testable microstamping-enabled firearm prototype. Accordingly, SAFE requested a prototype from TACLABS for testing, which TACLABS agreed to provide for purposes of a live-fire testing event in August 2023. In addition, the Office of the Attorney General issued a formal request for information as to any persons or entities who were willing and able to present a microstamping-enabled firearm (including any prototype) to the State for live-fire testing and other evaluation in connection with the Attorney General's viability investigation. TACLABS was the only respondent that made a submission in response to the request for information.

SAFE administered a live-fire testing event at the New Jersey State Police Technology Center in Hamilton, New Jersey on August 23, 2023. This testing event, led by Reinaldo Roldan (who was subsequently designated as the Microstamping Examiner), was conducted in the presence of both SAFE staff and state law enforcement. SAFE tested a 1991 Colt Commander,

¹⁸ See generally *Microstamping: A Technology to Help Solve Gun Crimes, Identify Gun Trafficking Networks and Reduce Gun Violence*, EDUCATION FUND TO STOP GUN VIOLENCE (2021), https://efsgv.org/wp-content/uploads/EFSGV_Microstamping-Report-2021.pdf.

¹⁹ See Andrew Punzo, Comment, *Microstamping: Hot Lead or Dud Round?*, 49 SETON HALL L. REV. 375, 379–80 (2018) (describing Lizotte and Ohar's development of microstamping); see also *Microstamping: A Technology to Help Solve Gun Crimes, Identify Gun Trafficking Networks and Reduce Gun Violence*, EDUCATION FUND TO STOP GUN VIOLENCE 28–29 (2021).

²⁰ See U.S. Patent No. 6,833,911 B2 (filed Feb. 21, 2003) (issued Dec. 21, 2004); U.S. Patent No. 6,886,284 B2 (filed Aug. 29, 2002) (issued May 3, 2005); U.S. Patent No. 2006/0174531 A1 (filed May 1, 2003) (issued Aug. 10, 2006); U.S. Patent No. 7,204,419 B2 (filed Jul. 18, 2003) (issued Apr. 17, 2007).

.45 ACP, serial number CJ18501, provided by TACLABS. SAFE returned the prototype to TACLABS at the conclusion of the testing event.

Lizotte represented to SAFE that, based on company records, the prototype had been fired over 1,800 times prior to the live-fire testing event. Lizotte further informed SAFE that the gun's firing pin had been engraved with two independently associable sets of distinctive markings: First, at the center of the firing pin, TACLABS engraved eight alphanumeric characters or symbols in two rows of four. Second, around the perimeter, TACLABS engraved a unique geometric pattern that Lizotte described as a "gear code," which can also be translated through a proprietary graphical software into the specific alphanumeric characters that are also engraved on the firing pin. Lizotte informed SAFE that he engraved redundant types of markings to aid forensic identification and association in the event that the engraving in its entirety did not impart as expected on any particular cartridge case.

Methodology

SAFE obtained the expected pattern to be imprinted by the microstamping-enabled firearm pin in advance of the testing, and required that three varieties of ammunition be used during the testing itself. For the test, an armorer employed by the Division of Criminal Justice fired fifty rounds of ammunition in an indoor firing range, at varying intervals, at the direction of the Microstamping Examiner.²¹ Ten of the fifty expended cartridge cases were designated for examination. The examination set consisted of the first expended cartridge case, the fiftieth, three collected randomly during a rapid-fire shooting interval, and five collected randomly from the remaining intervals. SAFE chose this methodology so that the evaluation would include expended cartridge cases from across a lengthy and varying firing sequence.

The Microstamping Examiner inspected each of the ten selected expended cartridge cases using a Leeds Forensic Systems Olympus SZX16 model LCF3 comparison microscope with serial number 484996-E, and took photographs for preservation and further review.²² For each sample, the Microstamping Examiner made qualitative assessments as to how many of the eight alphanumeric characters had been imparted, and as to what percentage of the gear code had been imparted.²³ Each step of the examination was reviewed by a second SAFE examiner

²¹ Testing commenced in seven intervals of eight fired rounds each. Additionally, during the various phases of fire, it became evident that several cartridges, when expelled, fell to an area of the range behind sound proofing features that restricted collection. As such, the Microstamping Examiner collected all expended cartridges available, and live fire continued until a total of fifty cartridge cases were collected.

²² This is a standard "NIBIN" comparison microscope. "NIBIN" is the National Integrated Ballistics Information Network—a worldwide system of forensic ballistics collection, comparison, and recording that is maintained by the ATF. The NJSP Ballistics Lab possesses a standard microscope used to collect data for NIBIN.

²³ The visual gear code transfer estimate of the Microstamping Examiner is a subjective assessment, which we have tried to balance by requiring a second SAFE examiner corroborate the assessment. SAFE did not have physical access to the propriety technology possessed by Lizotte to translate the gear code into alphanumeric characters at the testing site.

for corroboration. TACLABS and Lizotte were not involved in SAFE's evaluation of the expended cartridge cases.

Results

As noted above, the scope of this investigation is limited to the question of viability: whether microstamping technology exists that can impart a readily associable mark on an expended cartridge case with regularity, including after sustained firing. Here, the results show that the Colt prototype regularly imparted an associable mark on the expended cartridge cases taken from the fifty-round firing sequence.

Overall, associable information from the engraving transferred to every single cartridge case sample. Eight out of ten samples contained a complete transfer of the gear code. The remaining two—a randomly collected cartridge case sample and the last-fired cartridge case sample—transferred 50% and 80% of the gear code, respectively. The last-fired cartridge case also had seven of the eight alphanumeric characters imprinted. Further to the alphanumeric characters, all samples contained at least half of the expected eight characters. Specifically, one sample contained a complete transfer of eight characters (the first-fired sample); three samples contained seven transferred characters; one sample contained six transferred characters; one sample contained five transferred characters; and four samples contained four transferred characters. Of the four samples that had only four transferred alphanumeric characters, three nonetheless contained a full transfer of the gear code.

In sum, eight of the ten samples reproduced the entirety of the gear code, as well as at least half of the alphanumeric characters. Of the remaining two samples, one reproduced 80% of the gear code and seven of eight alphanumeric characters—a significant amount of information to aid a forensic examiner in associating a cartridge with the gun from which it was fired. The other reproduced 50% of both the gear code and the alphanumeric characters, which although incomplete could nevertheless be useful to a forensic examiner.

The Microstamping Examiner's scoring of each sample, along with photographs taken of each sample using the Leeds comparison microscope, is included here in Appendix B.

C. Prior Microstamping Technology Studies

For corroboration, SAFE reviewed the limited number of published studies designed to measure the effectiveness of microstamping, many of which are well over a decade old and evaluate older versions of the technology.²⁴ Accordingly, we have weighted most heavily the most recent relevant study on microstamping—a 2012 peer-reviewed study funded by the U.S.

²⁴ For a fuller discussion of the older studies conducted on microstamping, see Andrew Punzo, Comment, *Microstamping: Hot Lead or Dud Round?*, 49 SETON HALL L. REV. 375, 388–98 (2018). See also Chip Brownlee, *What Is Microstamping and Can It Help Solve Shootings*, THE TRACE, Jan. 23, 2023, <https://www.thetrace.org/2023/01/microstamping-gun-bullets-new-york>.

Department of Justice.²⁵ This study evaluated three different nine-millimeter semiautomatic handguns with engraved firing pins, using ten different brands of ammunition (of varying compositions). The firearm models were a Sig Sauer model P226, a Taurus model PT609, and a Hi-Point model C9. One hundred rounds of each brand of ammunition were fired through each pistol, totaling 1,000 rounds fired per handgun.

Similar to the engraving used in SAFE's live-testing event, the engraving used in this study contained a six-character alphanumeric sequence and a gear code around the circumference. The results showed over 90% of spent cases for the Sig Sauer and the Taurus had a legible transfer of all six alphanumeric characters, and approximately 70% of spent cases for the Hi-Point had a legible transfer of all six alphanumeric characters.²⁶

Analysis and Recommendation

SAFE's factual findings support the conclusion that microstamping-enabled firearms are technologically viable. SAFE's live-fire testing of a prototype microstamping-enabled firearm showed a successful transfer of a readily associable geometric marker even after fifty rounds were fired. When the geometric marker transfer was not complete, the cartridge cases nonetheless contained substantial transfers of the geometric marker or alphanumeric characters that conveyed legible, associable information for forensic examiners. The 2012 peer-reviewed study lends further support to microstamping's technological viability. That study showed over 90% successful transfer rates of associable alphanumeric characters to cartridge cases from a microstamping-enabled Sig Sauer model P226 and a microstamping-enabled Taurus model PT609.

Based on these findings, and the Attorney General's performance standards for microstamping technology in microstamping-enabled firearms, we recommend that the Attorney General certify that viable microstamping-enabled technology exists.

²⁵ L. Scott Chumbley et al., *Clarity of Microstamped Identifiers as a Function of Primer Hardness and Type of Firearm Action*, 44 ASS'N FIREARM & TOOL MARK EXAMINERS J. 145 (2012). We acknowledge that Lizotte and his co-inventor Orest Ohar were among the several co-authors of this study, which presents questions of bias. There were, however, five other members of the research team, including four members of Iowa State University and one retired member of the Illinois State Police. The study was also released in a peer-reviewed publication.

²⁶ L. Scott Chumbley et al., *Clarity of Microstamped Identifiers as a Function of Primer Hardness and Type of Firearm Action*, 44 ASS'N FIREARM & TOOL MARK EXAMINERS J. 145, 153 (2012). Only the Sig Sauer and Hi-Point consistently transferred a visible gear code. The study conducted a high-level qualitative assessment of the gear code transfer. Specifically, the study only measured whether there was *any* observable transfer of the gear code, and did not determine what percentage of the code was visible. While both the Sig Sauer and Hi-Point consistently transferred a visible gear code, the Taurus's gear code "transferred either very poorly or not at all." L. Scott Chumbley et al., *Clarity of Microstamped Identifiers as a Function of Primer Hardness and Type of Firearm Action*, 44 ASS'N FIREARM & TOOL MARK EXAMINERS J. 145, 148, 155 (2012). The authors also published a limited follow-up study in which they examined twenty-six poorly stamped cartridge cases from the 2012 study using scanning electronic microscopy (SEM) to further test the transfer of the gear code. Taylor Grieve, et al., *Gear Code Extraction from Microstamped Cartridges*, 45 ASS'N FIREARM & TOOL MARK EXAMINERS J. 64 (2013).

MICROSTAMPING
Performance Standards and Qualifying Criteria

For a firearm to qualify as a microstamping-enabled firearm for inclusion on the microstamping roster as set forth under N.J.S.A. 2C:58-2.13 *et seq.*, the firearm must meet the following performance standards and qualifying criteria:

1. When the firearm fires a round, it shall impart an imprint, etching, stamp, or other marker onto the expended cartridge case that is readily associable by law enforcement and other governmental authorities with the specific firearm from which the cartridge case was expended.
2. The firearm must impart such a marker regularly, including after sustained firing of the weapon.
3. The firearm shall not physically deform or deteriorate as a result of firing rounds, and shall not fire with less reliability than other commercial firearms sold in New Jersey.
4. The firearm shall not discharge in response to abuse or mishandling of the firearm.
5. The firearm's design shall comply with all applicable New Jersey and federal laws.
6. The firearm shall be made by a manufacturer possessing all licenses required by law for such manufacturers.
7. The firearm shall be submitted for application by the manufacturer or its authorized distributor or dealer, or otherwise with the consent of the manufacturer or authorized distributor or dealer.

MICROSTAMPING

Process for Determination of Microstamping-Enabled Firearms

Statutory Background

A Microstamping Examiner appointed by the Attorney General will determine whether the make and model of firearm proposed by an Applicant may be designated as a microstamping-enabled firearm. N.J.S.A. 2C:58-2.13(e). The Microstamping Examiner's determination is based on whether the firearm meets the Attorney General's microstamping performance standards and qualifying criteria. N.J.S.A. 2C:58-2.13(c). Upon designation of the first microstamping-enabled firearm, the Microstamping Examiner shall create a microstamping roster, which shall include all firearms designated as such. N.J.S.A. 2C:58-2.13(d).

Process

1. The Microstamping Examiner's determination of whether a make and model of firearm meets the microstamping performance standards and qualifying criteria shall be based upon (1) application materials submitted by the Applicant; and (2) live-fire testing by a testing entity of one or more firearms of that make and model. The testing shall be conducted according to criteria to be issued by the Microstamping Examiner.
2. The Microstamping Examiner will issue application materials and additional guidance, in conjunction with the Office of the Attorney General and New Jersey State Police, for Applicants as quickly as practicable after their appointment. The guidance will include further information on how the Microstamping Examiner will review and approve an Applicant's testing plan, including protocols for conducting live-fire tests and evaluating test results. The guidance will also include further information on what the Microstamping Examiner will consider to be an imprint, etching, stamp, or other marker that is readily associable with the specific firearm from which the cartridge case was expended.
3. The entity conducting live-fire testing shall issue a Final Test Report to the Applicant at the conclusion of the testing process, with a copy to the New Jersey State Police, and the Attorney General or designee.
4. Once the Final Test Report is issued, the Applicant may apply to the Microstamping Examiner for their determination of whether a firearm can be designated as a microstamping-enabled firearm. Application materials shall include the Final Test Report; a statement of how the imprint, etching, stamp, or other marker shall be readily associable by law enforcement and other governmental authorities to a specific firearm, and of how any associated records will be maintained; and certifications of compliance

with federal and New Jersey law. The Microstamping Examiner may ask the Applicant for additional information or materials if needed to reach their determination.

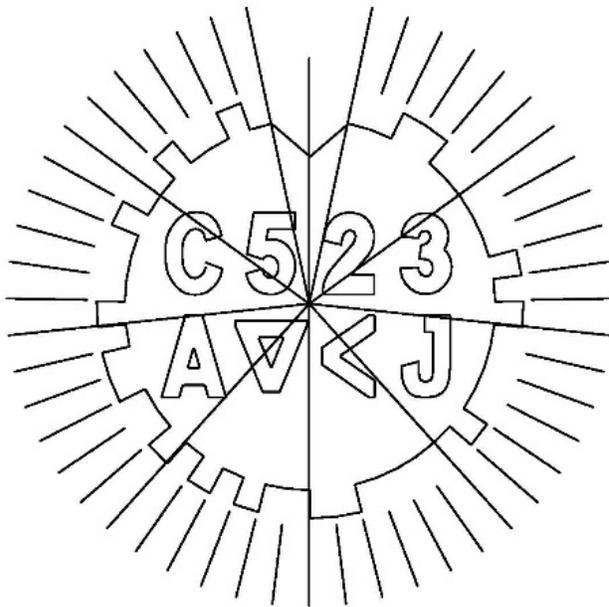
5. After reviewing Applicant's materials, the Microstamping Examiner will determine whether the firearm meets the microstamping performance standards and qualifying criteria. The Microstamping Examiner will issue a Preliminary Decision with a written justification.
6. If the Applicant's firearm is denied for inclusion on the roster by the Microstamping Examiner, an Applicant may, within 30 days of the Microstamping Examiner's Preliminary Decision, submit a letter to the Microstamping Examiner seeking reconsideration. The Microstamping Examiner must then respond to the reconsideration letter with a Final Decision accompanied by a written justification. If the Applicant does not submit a reconsideration letter within 30 days of the issuance of the Preliminary Decision, then the Preliminary Decision shall automatically convert to a Final Decision. The Applicant may submit a new application for the rejected firearm to the Microstamping Examiner no earlier than 60 days after the issuance of the Final Decision.
7. If the Applicant's firearm is approved by the Microstamping Examiner, the firearm shall be designated as a microstamping-enabled firearm and placed on the microstamping roster, which shall be maintained by the Microstamping Examiner and published on a website maintained by the New Jersey State Police.
8. Any alteration to the design of a make and model of firearm that has been approved for addition on the roster shall require a determination from the Microstamping Examiner that the firearm continues to meet the performance standards and qualifying criteria. The Microstamping Examiner also reserves the right to remove firearms from the microstamping roster if new information indicates that the firearm does not meet the performance standards and qualifying criteria, or is otherwise in violation of New Jersey or federal laws.
9. If the Microstamping Examiner determines that a firearm should be removed from the microstamping roster, they must provide a Notice of Intent to the manufacturer of the firearm. The Notice of Intent must provide a written justification for the removal of the firearm. The manufacturer may respond to the Notice of Intent in writing within 30 days of issuance of the Notice of Intent. If no written response is submitted by the manufacturer challenging the Notice of Intent, then the firearm shall be removed from the microstamping roster immediately after the 30-day period. If a written response by the manufacturer is submitted within the 30-day period, the Microstamping Examiner must issue a Final Decision of Removal with a written justification for the decision.

Live-Fire Testing Results and Scoring

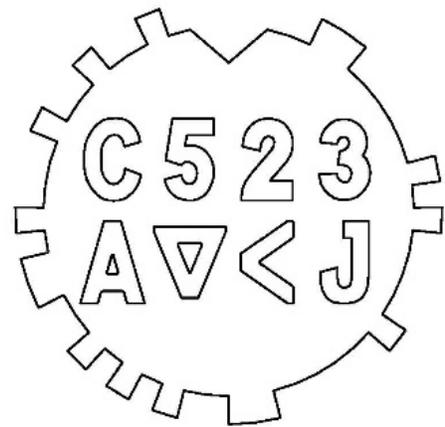
This appendix contains scoring for each of the ten cartridge casing samples from a fifty-round firing sequence examined by the Microstamping Examiner, along with accompanying pictures of each sample taken at the New Jersey State Police Ballistics Lab. The sample consists of (1) the first cartridge fired; (2) five randomly selected cartridges from standard firing sequences; (3) three randomly selected cartridges from a rapid-fire firing sequence; and (4) the final cartridge fired. For each sample, the Microstamping Examiner made assessments as to how many of the eight alphanumeric characters had imparted, and what percentage of the gear code had imparted. These assessments were made based on visual inspection of each primer contained in each cartridge casing under a microscope in real time, and based on examination of corresponding photographs taken of each sample under the microscope. The microscope used was a Leeds Forensic Systems Olympus SZX16 model LCF3 comparison microscope, with serial number 484996-E. The scoring for each sample, along with corresponding pictures of each sample, are included below.

TACLABS, Inc. provided SAFE with the expected microstamping mark. That mark, consisting of an eight-digit alphanumeric code and a geometric gear code surrounding the mark, is depicted below as it appears on the firing pin. Please note that the samples, as examined and photographed, contained mirror images of the expected mark. Accordingly, the corresponding pictures have been flipped horizontally for ease of visualization.

Expected Microstamping Mark Provided by TACLABS



TACLABS Copyright 2003-2023
TACLABS Trademark



TACLABS Copyright 2003-2023
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Sample Cartridge “1” (First Cartridge Fired)

Cartridge Label	Gear Code Score	Alphanumeric Code Score
Cartridge 1	100%	100%
		Observable Characters
		8 of 8 visible as: C 5 2 3 A ∇ < J

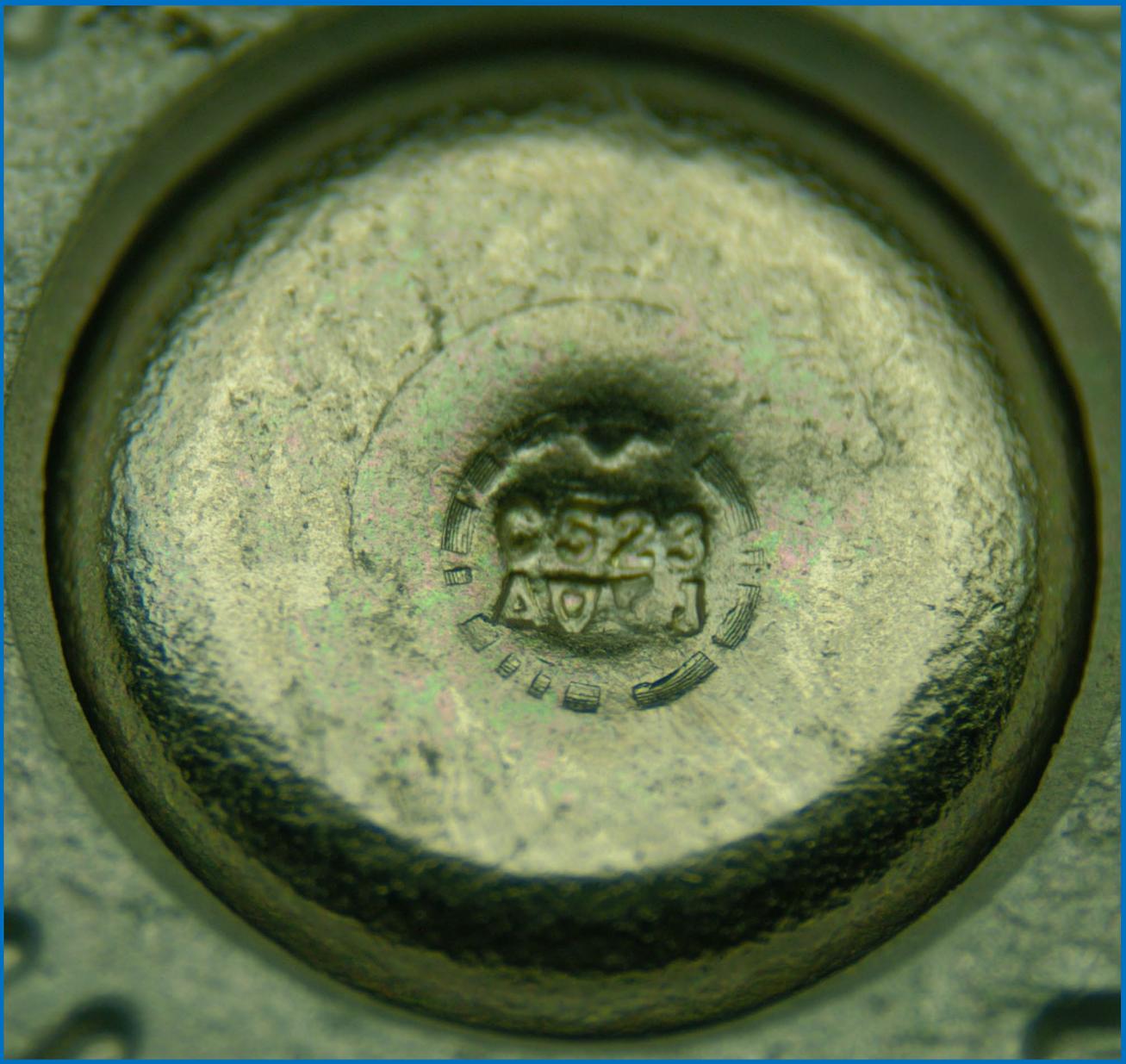
Sample Cartridge “1”: Photograph A



Sample Cartridge "1": Photograph B



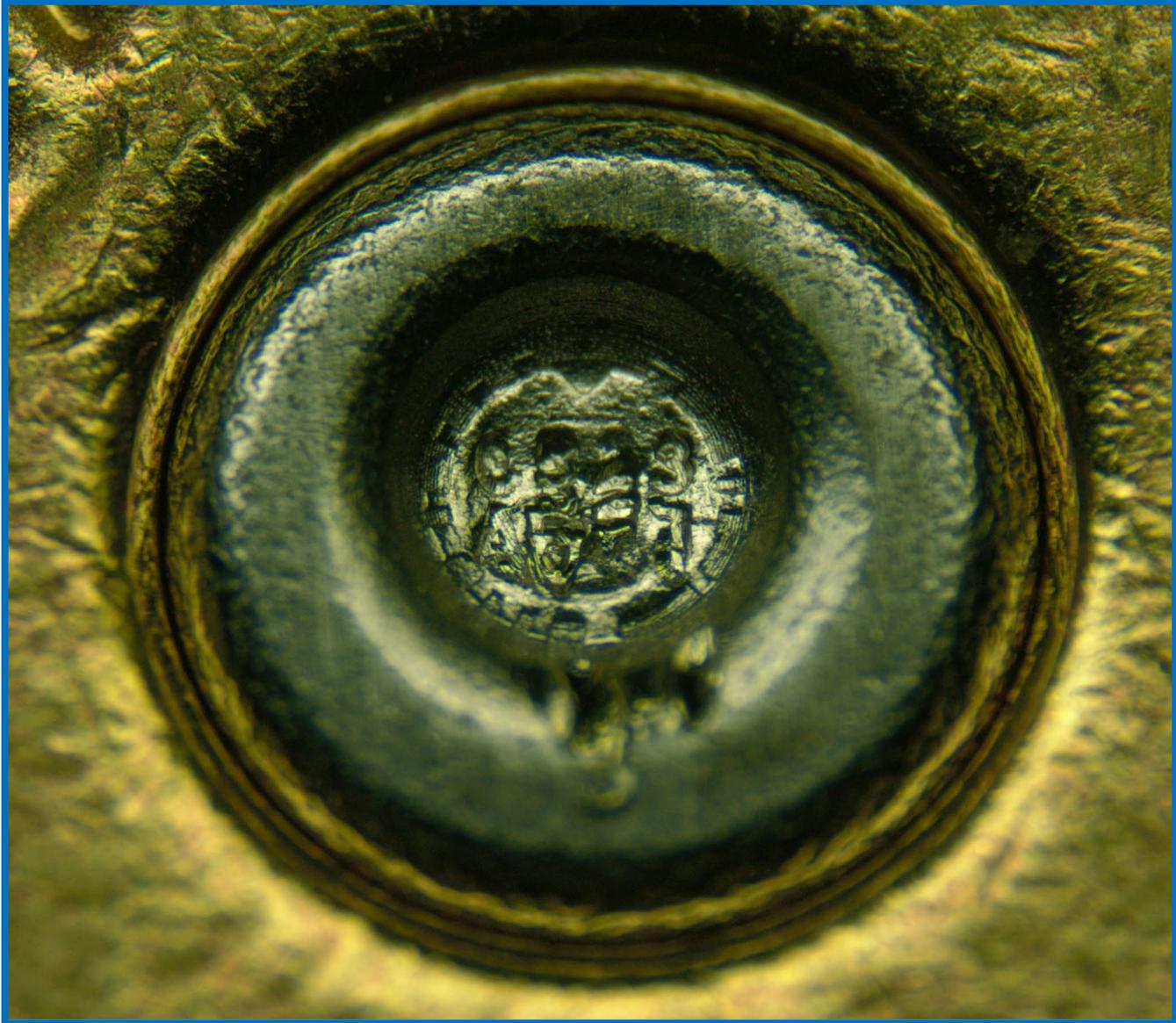
Sample Cartridge "1": Photograph C



Sample Cartridge “Random 1”

Cartridge Label	Gear Code Score	Alphanumeric Code Score
Random 1	100%	75%
		Observable Characters
		6 of 8 visible as: C 5 2 3 A ∇ _ _

Sample Cartridge “Random 1”: Photograph A



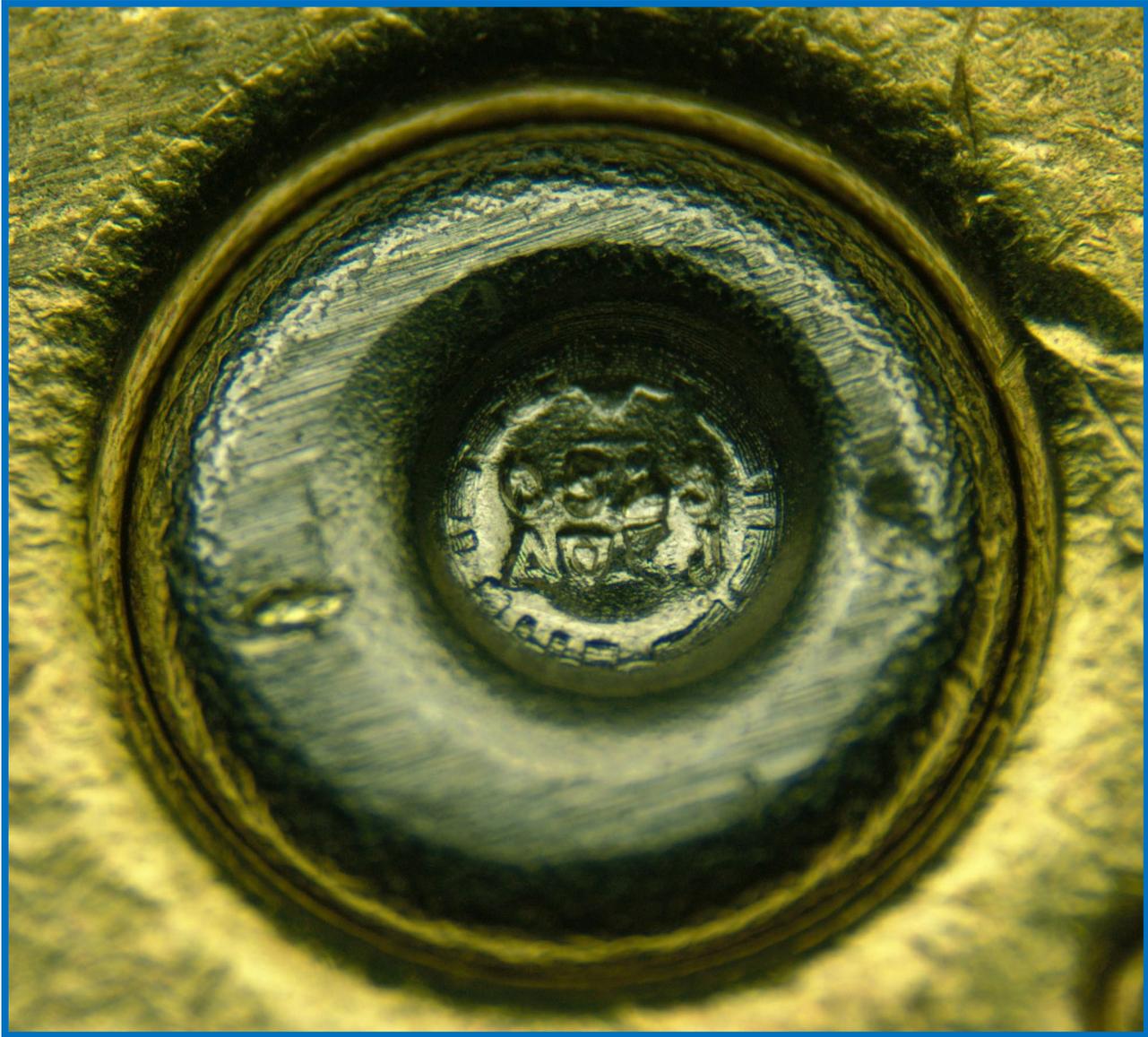
Sample Cartridge "Random 1": Photograph B



Sample Cartridge “Random 2”

Cartridge Label	Gear Code Score	Alphanumeric Code Score
Random 2	100%	87.5%
		Observable Characters
		7 of 8 visible as: _ 5 2 3 A ∇ < J

Sample Cartridge “Random 2”: Photograph A



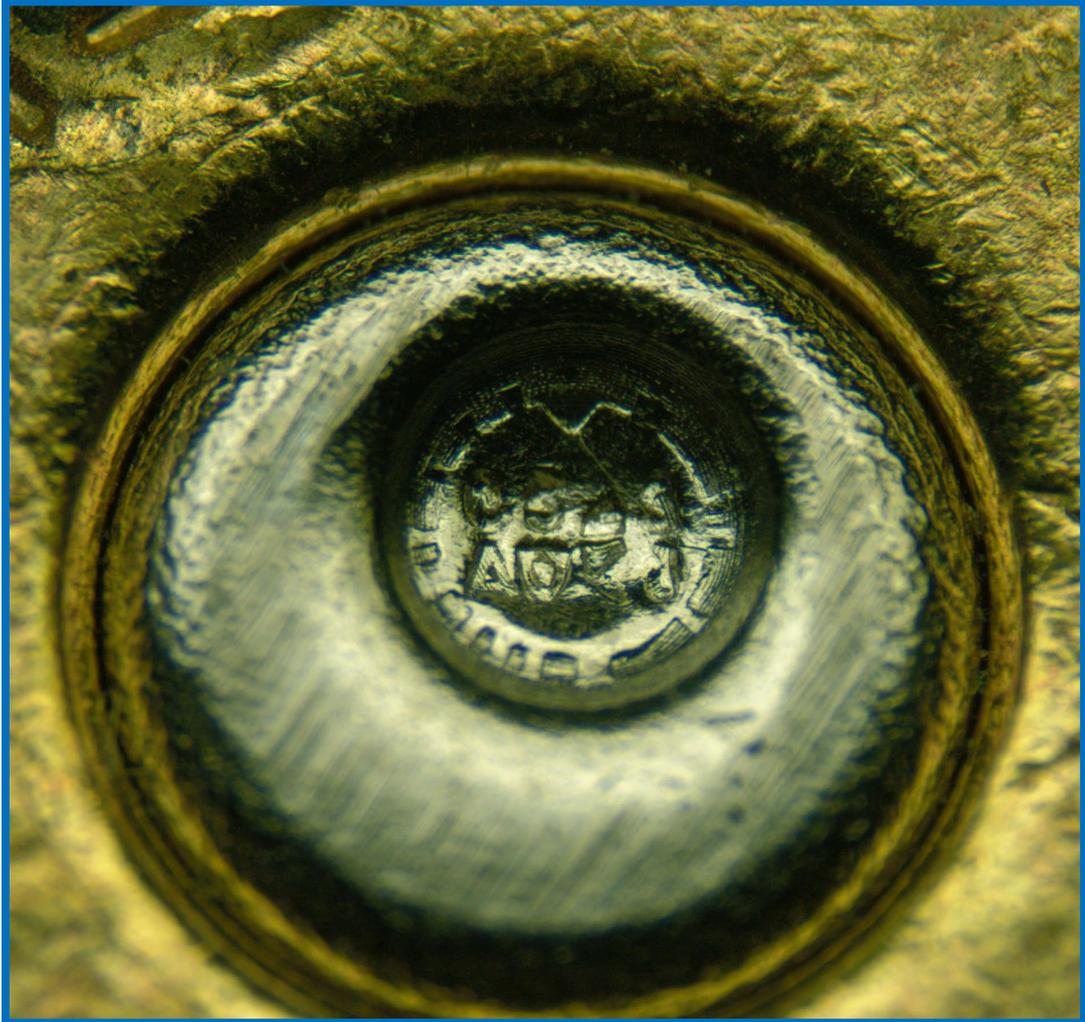
Sample Cartridge "Random 2": Photograph B



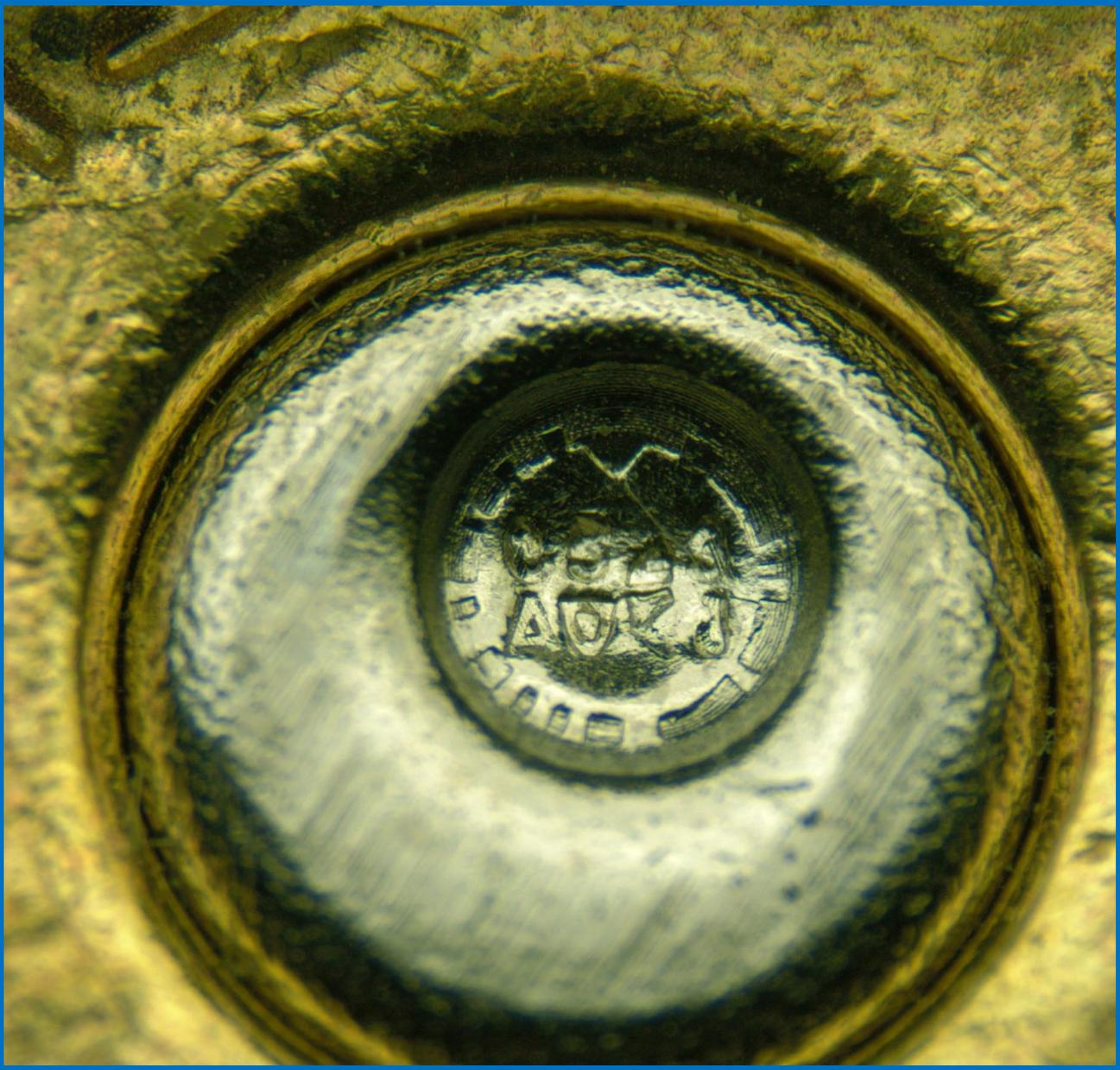
Sample Cartridge “Random 3”

Cartridge Label	Gear Code Score	Alphanumeric Code Score
Random 3	100%	87.5%
		Observable Characters
		7 of 8 visible as: C 5 _ 3 A ∇ < J

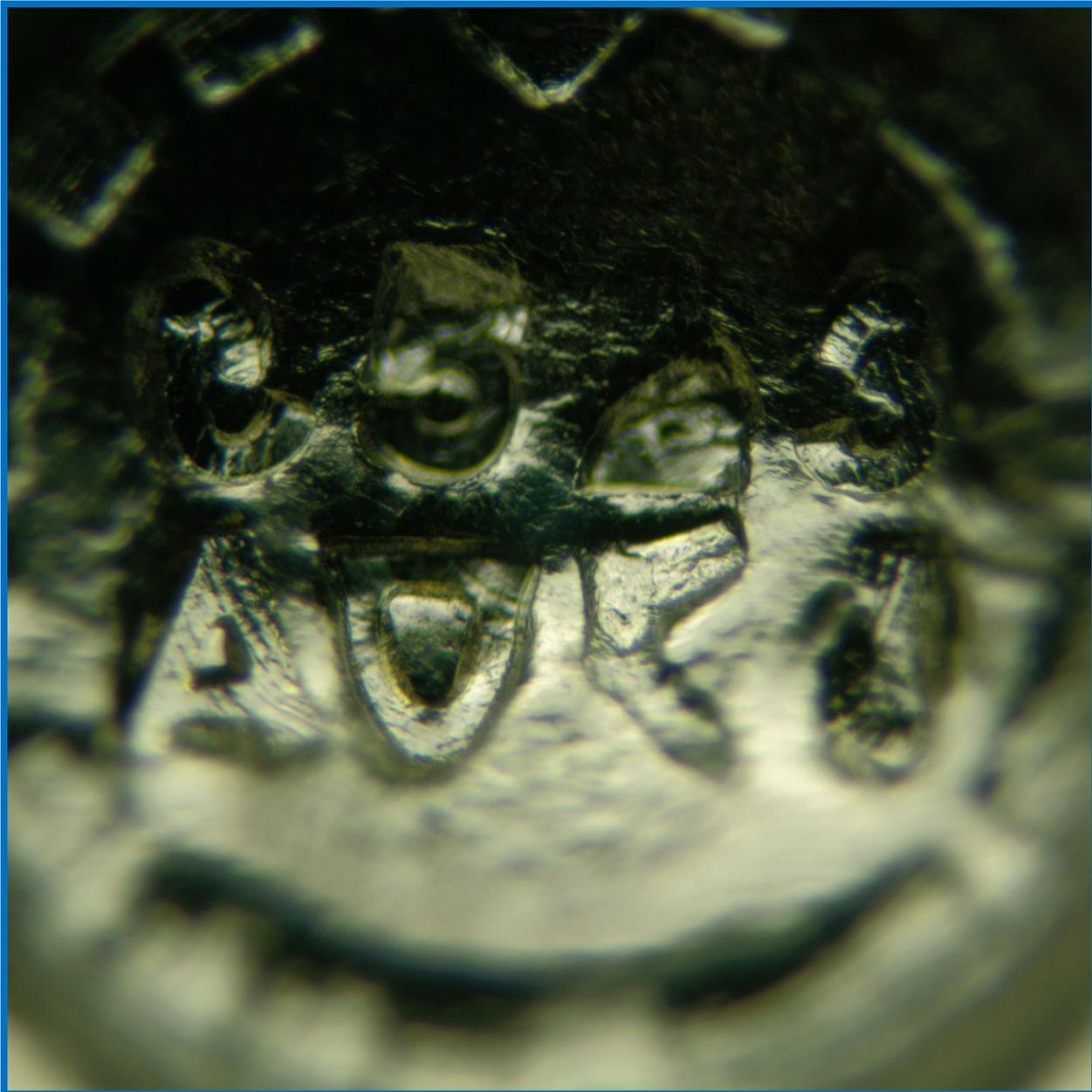
Sample Cartridge “Random 3”: Photograph A



Sample Cartridge "Random 3": Photograph B



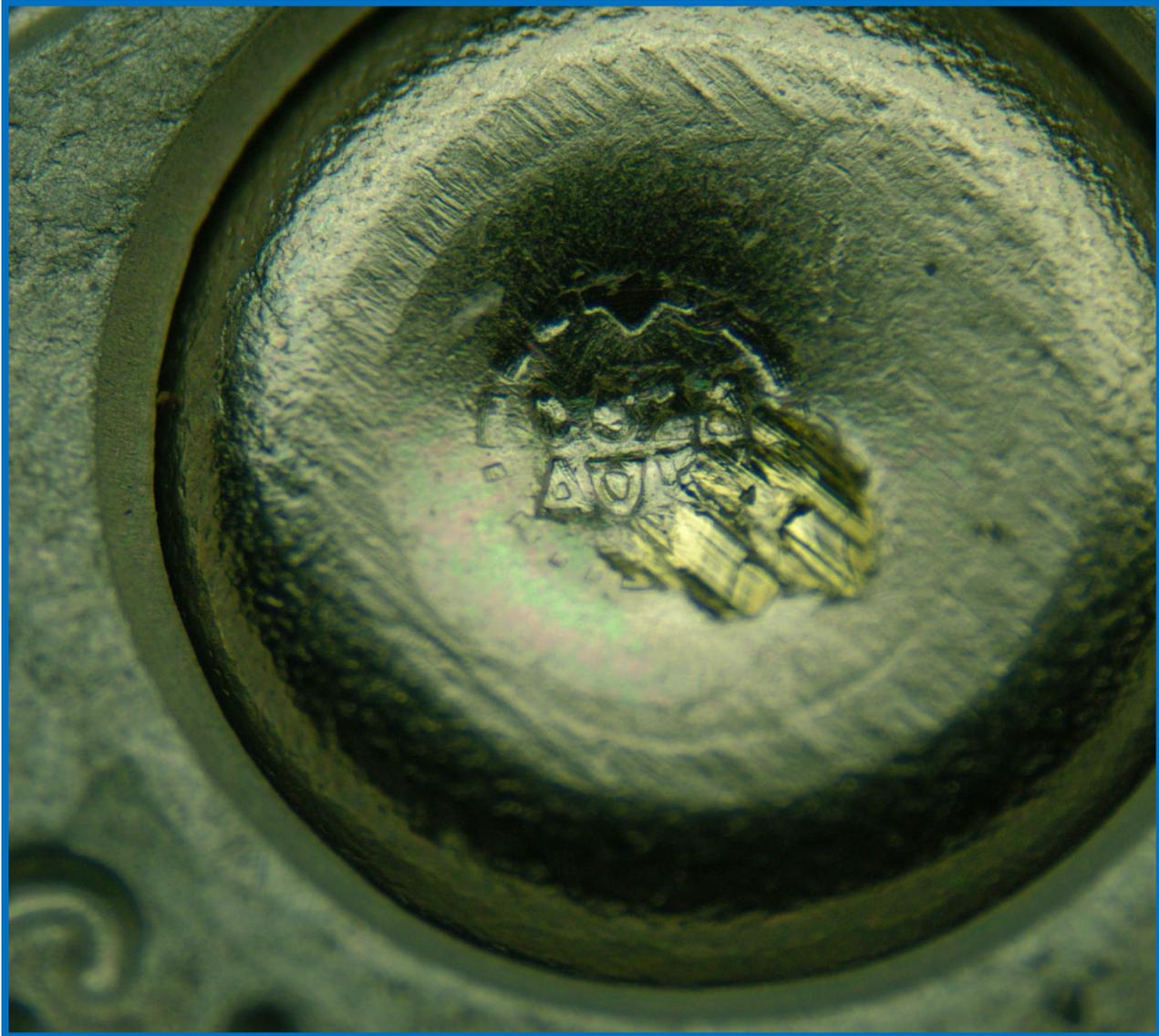
Sample Cartridge "Random 3": Photograph C



Sample Cartridge “Random 4”

Cartridge Label	Gear Code Score	Alphanumeric Code Score
Random 4	50%	50%
		Observable Characters
		4 of 8 visible as: __ 2 3 A ∇ __

Sample Cartridge “Random 4”: Photograph A



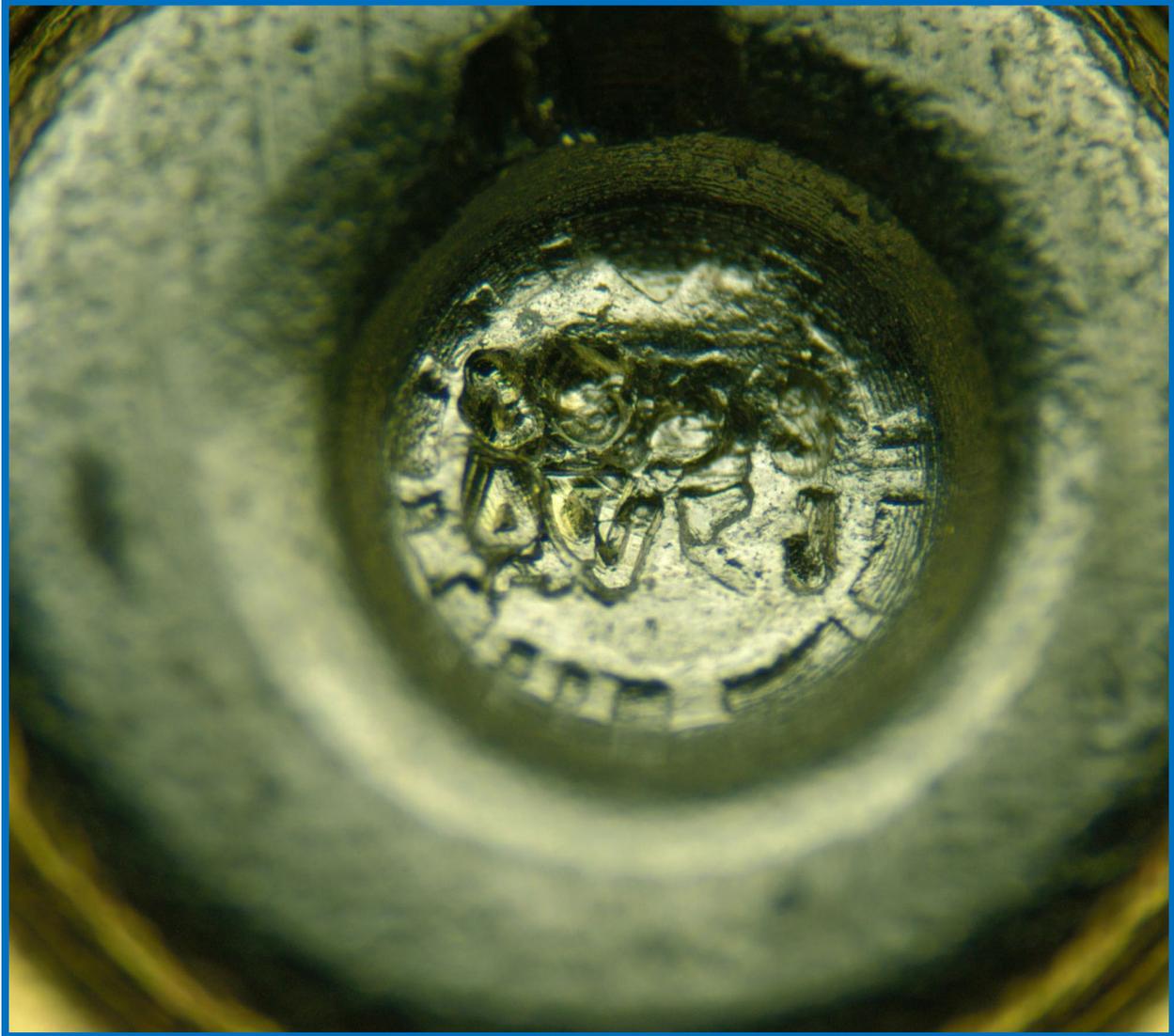
Sample Cartridge "Random 4": Photograph B



Sample Cartridge “Random 5”

Cartridge Label	Gear Code Score	Alphanumeric Code Score
Random 5	100%	62.5%
		Observable Characters
		5 of 8 visible as: _ _ _ 3 A ∇ < J

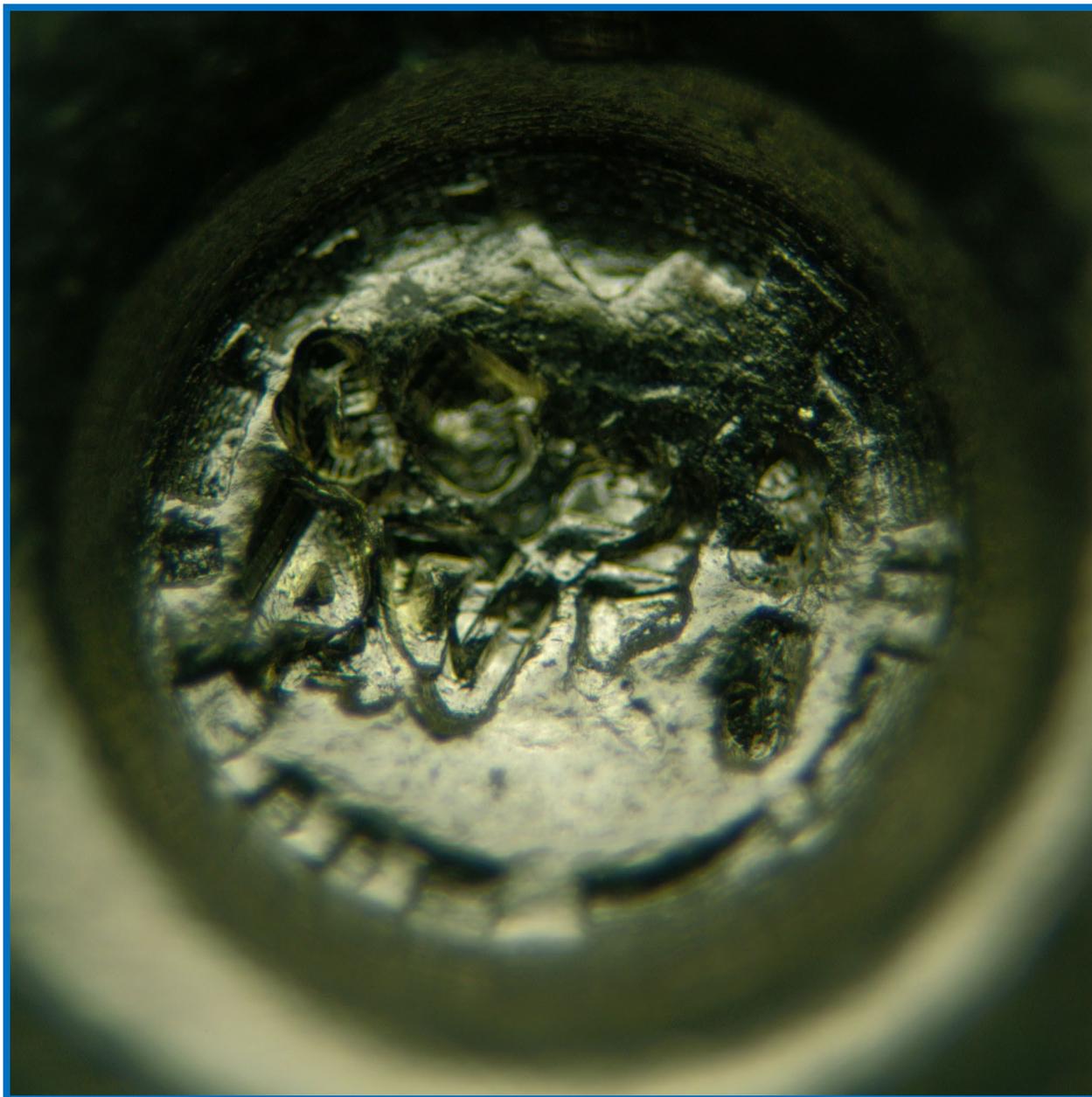
Sample Cartridge “Random 5”: Photograph A



Sample Cartridge "Random 5": Photograph B



Sample Cartridge "Random 5": Photograph C



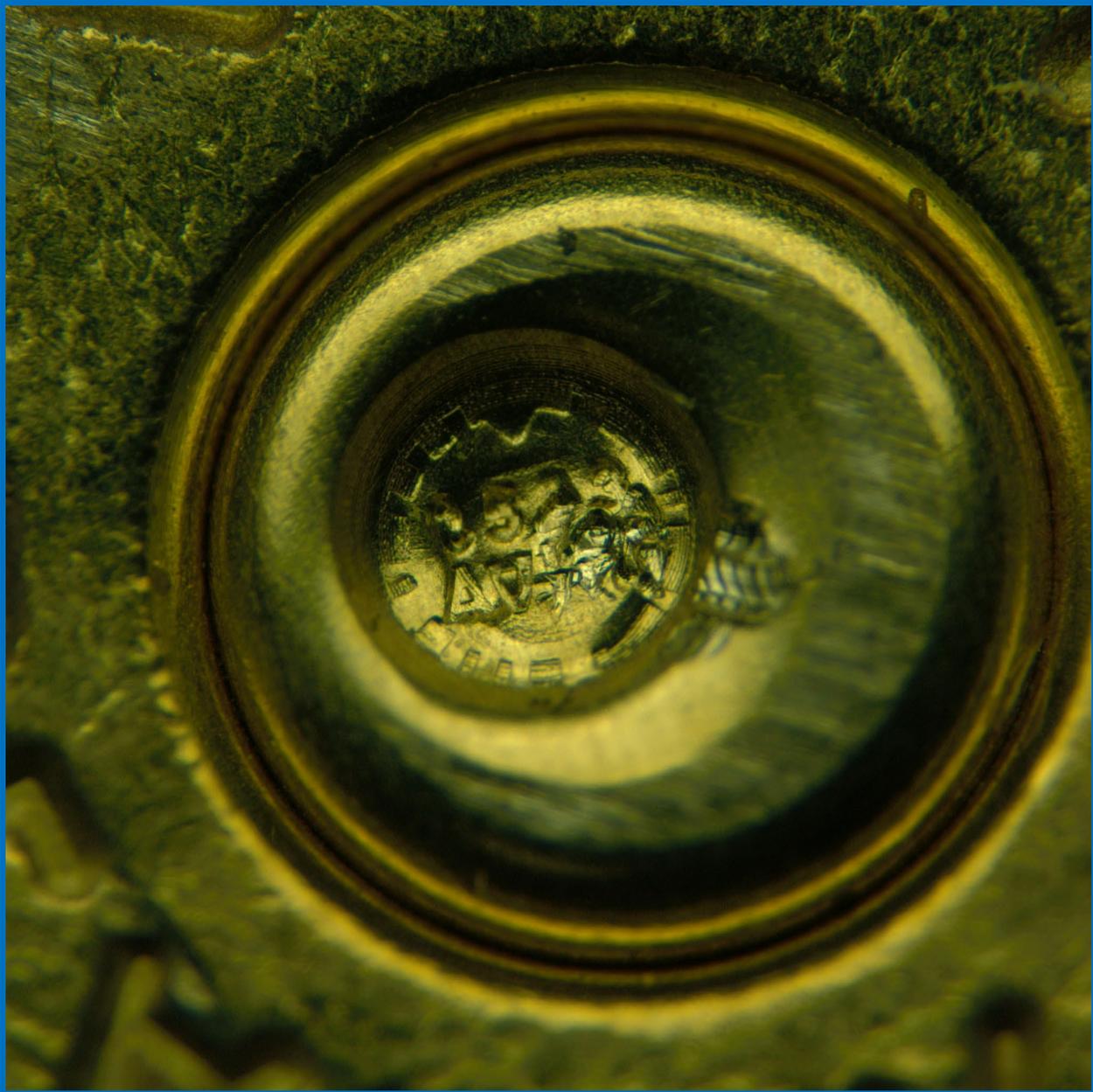
Sample Cartridge “Rapid 1”

Cartridge Label	Gear Code Score	Alphanumeric Code Score
Rapid 1	100%	50%
		Observable Characters
		4 of 8 visible as: _ 5 _ 3 A ▽ _ _

Sample Cartridge “Rapid 1”: Photograph A



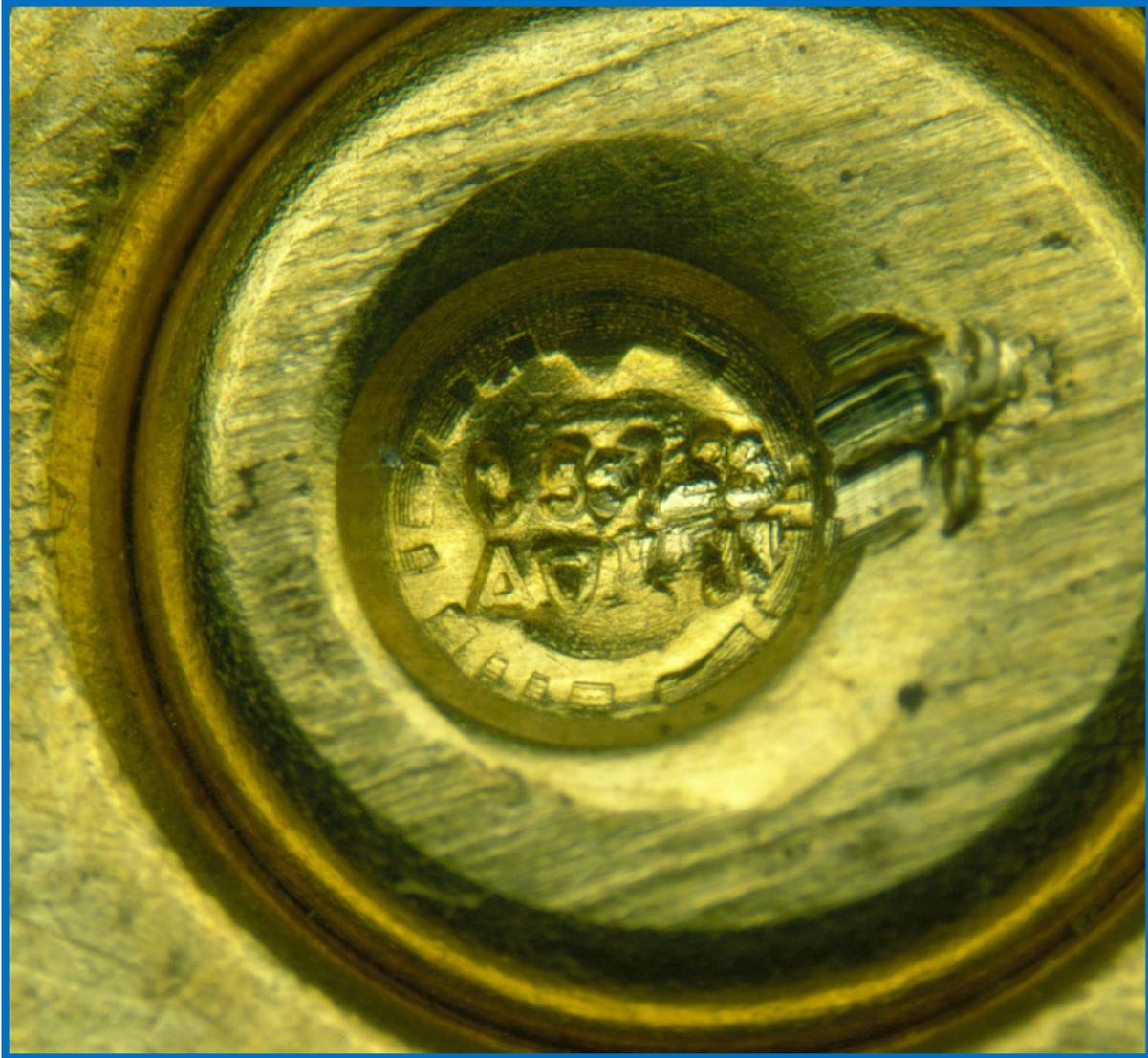
Sample Cartridge "Rapid 1": Photograph B



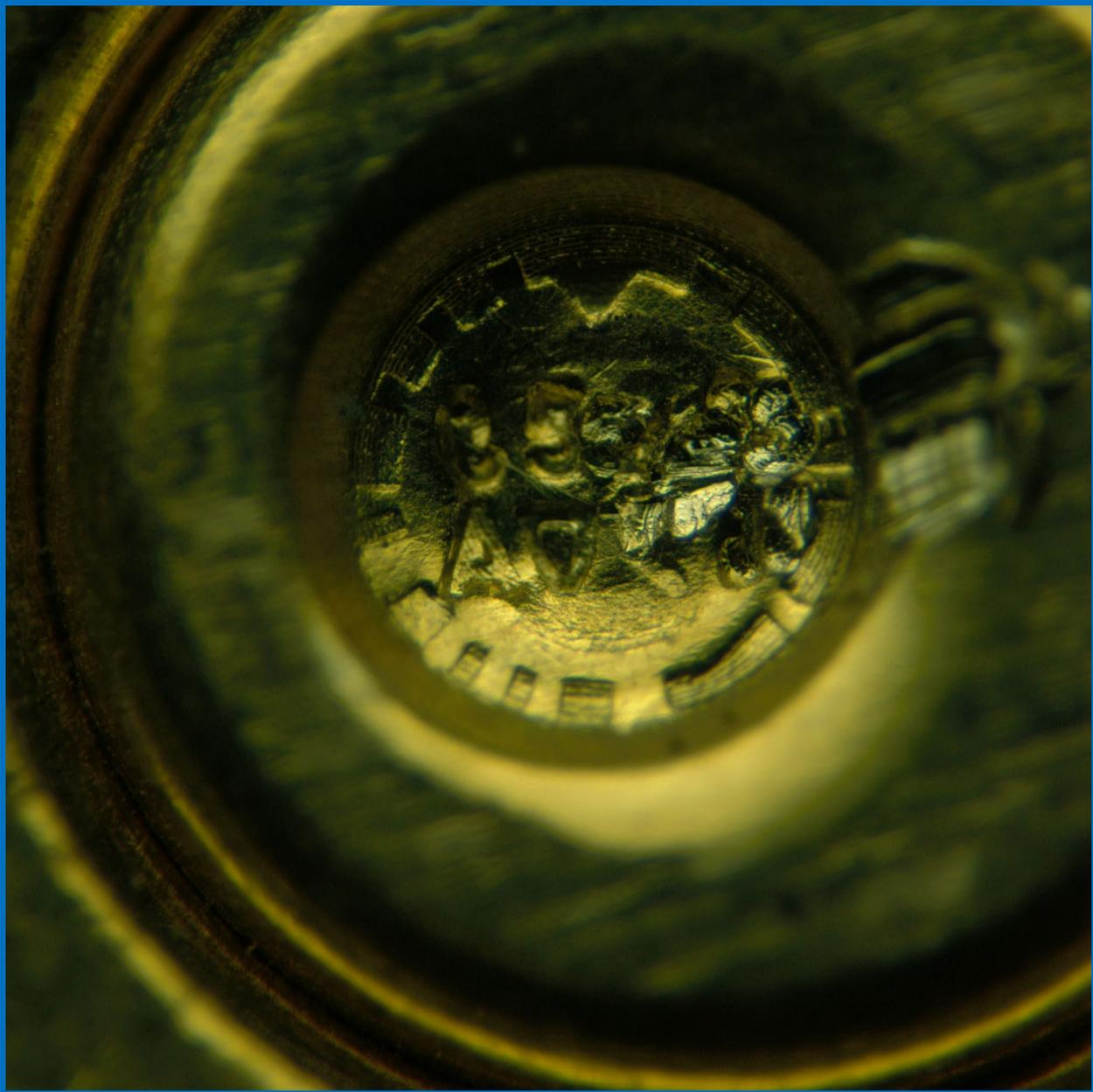
Sample Cartridge “Rapid 2”

Cartridge Label	Gear Code Score	Alphanumeric Code Score
Rapid 2	100%	50%
		Observable Characters
		4 of 8 visible as: _ 5 _ 3 A ∇ _ _

Sample Cartridge “Rapid 2”: Photograph A



Sample Cartridge "Rapid 2": Photograph B



Sample Cartridge “Rapid 3”

Cartridge Label	Gear Code Score	Alphanumeric Code Score
Rapid 3	100%	50%
		Observable Characters
		4 of 8 visible as: _ 5 _ _ A ∇ _ J

Sample Cartridge “Rapid 3”: Photograph A



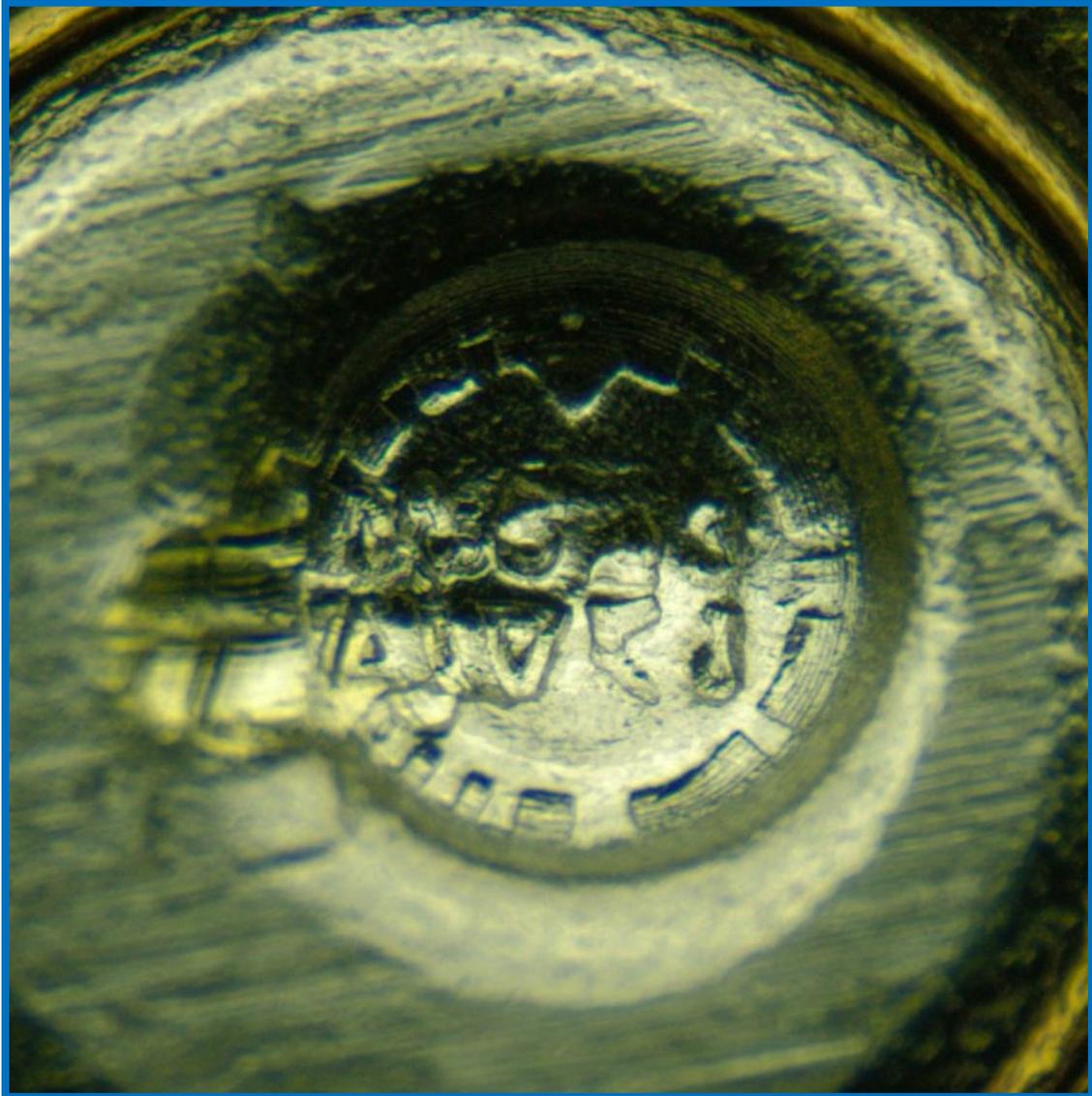
Sample Cartridge "Rapid 3": Photograph B



Sample Cartridge “Final” or “F” (*Last Cartridge Fired*)

Cartridge Label	Gear Code Score	Alphanumeric Code Score
Final	80%	87.5%
		Observable Characters
		7 of 8 visible as: _ 5 2 3 A ∇ < J

Sample Cartridge “F”: Photograph A



Sample Cartridge "F": Photograph B

