

# *Impression and Pattern Evidence Symposium*

**Analysis Reports: Do Your Written Conclusions  
Reflect Your Testimony?**

**Firearms Examinations**

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# Standardization of Reporting

- **ASCLD-LAB Accreditation**
- **ISO Standards**
- **Scientific Working Group for Firearms & Toolmarks (SWGUN)**
- **Association of Firearm & Toolmark Examiners (AFTE)**
- **AFTE Glossary**
- **AFTE Theory of Identification as it Relates to Toolmarks**

# Scientific Working Group for Firearms and Toolmarks (SWGGIN)

**The purpose of SWGGUN is to develop a series of consensus guidelines for the firearm and toolmark discipline and to disseminate SWGGUN guidelines, studies, and other findings that may be of benefit to the forensic community.**

# Scientific Working Group for Firearms and Toolmarks (SWGGIN)

At a minimum, the documentation must include interpretable depictions or descriptions of the agreement or disagreement of individual and/or class characteristics to the extent that another qualified firearm and toolmark examiner, without the benefit of the evidence itself, can review the case record, understand what was compared, and evaluate why the examiner arrived at the reported conclusion.

# Scientific Working Group for Firearms and Toolmarks (SWGGIN)

## Guidelines for the Documentation of Firearm Examinations (draft adopted 04/13/10)

### 1.0 Objective

The purpose of this document is to set forth guidelines to Firearm Examiners conducting forensic examinations of firearms.

# Scientific Working Group for Firearms and Toolmarks (SWGGIN)

## **2.0 Introduction**

**2.1** The examination of any firearm will be documented. This documentation may include the condition and physical characteristics of the firearm as received and will include information related to tests conducted with the firearm.

**2.2** Generally accepted forms of documentation include, but are not limited to, worksheets, laboratory notes, sketches, photographs, video and reference material.

# Scientific Working Group for Firearms and Toolmarks (SWGGIN)

## **Guidelines for the Standardization of Comparison Documentation**

### **1.0 Objective**

The purpose of this document is to set forth a scientifically acceptable standard for documenting, in a case record, the observations that support the reported conclusion.

# Scientific Working Group for Firearms and Toolmarks (SWGGIN)

## **2.0 Procedures**

- 2.1 The case record must contain documentation of observations that support a reported conclusion.
- 2.2 At a minimum, the documentation must include depictions or descriptions of the agreement or disagreement of individual and/or class characteristics to the extent that another qualified firearm and toolmark examiner, without the benefit of the evidence itself, can review the case record, understand what was compared, and evaluate why the examiner arrived at the reported conclusion.



# Scientific Working Group for Firearms and Toolmarks (SWGGIN)

- 2.3 The supporting documentation of one comparison may be used for additional evidence within a case, provided the agreement described or depicted is representative of the additional comparison(s).
- 2.4 It must be documented in the case record which items are being depicted and/or described.

# Scientific Working Group for Firearms and Toolmarks (SWGGIN)

2.5 Methods of documentation including imaging, narrative descriptions, sketches, diagrams, charts, worksheets, tabulation of consecutive matching striae (CMS), or a combination of the above methods may serve to satisfy the requirements of this standard.

*(NOTE: The above mentioned documentation methods are not sufficient for the determination or verification of a conclusion.)*

## Transition from ASCLD/LAB Legacy to ISO/IEC 17025

- 2.4 When opinions and interpretations are included, the laboratory shall document the basis upon which the opinions and interpretations have been made. Opinions and interpretations shall be clearly marked as such in the test report. [5.10.5]
- 2.4.1 Reports which contain test results enhanced with the conclusion, opinion or interpretation shall in some way notify the customer that the report contains conclusions, opinions and interpretations of the person issuing the report. This may be accomplished in a variety of ways.

# SWGGUN Guidelines; Technical Review

**9.2. Technical Review:** A laboratory shall have policies in place for the technical review of examination documentation and reports within the firearm and toolmark discipline. The procedure shall ensure that the conclusions of an examiner are reasonable, within the constraints of validated scientific knowledge, and supported by the examination documentation. The procedure shall define the scope of the technical review, establish the parameters of the review process, specify how technical reviews are documented, and describe a course of action to be taken if a discrepancy is found.

# AFTE Theory of Identification as it Relates to Toolmarks

1. The theory of identification as it pertains to the comparison of toolmarks enables opinions of common origin to be made when the unique surface contours of two toolmarks are in “sufficient agreement.”
2. This “sufficient agreement” is related to the significant duplication of random toolmarks as evidenced by the correspondence of a pattern or combination of patterns of surface contours.

# AFTE Theory of Identification as it Relates to Toolmarks

2. (cont.) Significance is determined by the comparative examination of two or more sets of surface contour patterns comprised of individual peaks, ridges and furrows. Specifically, the relative height or depth, width, curvature and spatial relationship of the individual peaks, ridges and furrows within one set of surface contours are defined and compared to the corresponding features in the second set of surface contours.

# AFTE Theory of Identification as it Relates to Toolmarks

2. (cont.) Agreement is significant when it exceeds the best agreement demonstrated between toolmarks known to have been produced by different tools and is consistent with agreement demonstrated by toolmarks known to have been produced by the same tool. The statement that “sufficient agreement” exists between two toolmarks means that the agreement is of a quantity and quality that the likelihood another tool could have made the mark is so remote as to be considered a practical impossibility.

# AFTE Theory of Identification as it Relates to Toolmarks

3. Currently the interpretation of individualization/identification is subjective in nature, founded on scientific principles and based on the examiner's training and experience.





## Range of Conclusions Possible When Comparing Toolmarks (AFTE Glossary 5<sup>th</sup> ed.)

**The examiner is encouraged to report the objective observations that support the findings of toolmark examinations. The examiner should be conservative when reporting the significance of these observations.**

# Range of Conclusions Possible When Comparing Toolmarks

**Identification:** Agreement of a combination of individual characteristics and all discernible class characteristics where the extent of agreement exceeds that which can occur in the comparison of toolmarks made by different tools and is consistent with the agreement demonstrated by toolmarks known to have been produced by the same tool.

# Range of Conclusions Possible When Comparing Toolmarks

## **Inconclusive:**

- A. Some agreement of individual characteristics and all discernible class characteristics, but insufficient for an identification.
- B. Agreement of all discernible class characteristics without agreement or disagreement of individual characteristics due to an absence, insufficiency, or lack of reproducibility.
- C. Agreement of all discernible class characteristics and disagreement of individual characteristics, but insufficient for an elimination.

# Range of Conclusions Possible When Comparing Toolmarks

## **Elimination:**

Significant disagreement of discernible class characteristics and/or individual characteristics.

## **Unsuitable:**

Unsuitable for examination.

# AFTE Glossary; Standard Terminology

## **Rifling**

Helical grooves in the bore of a firearm barrel to impart rotary motion to a projectile.

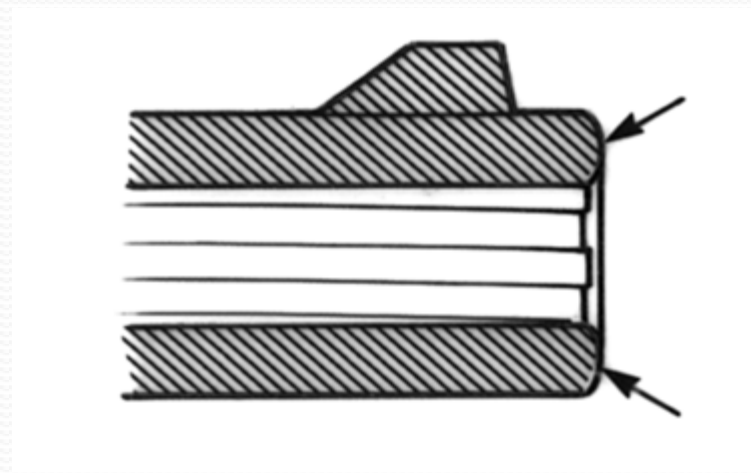
## **Cartridge**

A single unit of ammunition consisting of the case, primer, and propellant with one or more projectile(s).  
Also applies to a shotshell.

AFTE Glossary  
Example of  
definition and  
diagram

**Crown**

Any of various forms of muzzle treatment meant primarily to protect the rifling. It may be a chamfering of the bore, counterbore, or radius. Also called **MUZZLE CROWN**.



# Terminology in Report Conclusions and Testimony

**Some words or terms can be problematic in interpretation by the Court, jury, and counsels. The terms are not in themselves inaccurate in meaning, however they may be imprecise in understanding.**

# Terminology in Report Conclusions and Testimony

For example:

**“consistent with”**

**This term can have very different interpretations to the reader, or the jury when used in testimony.**

**“Consistent with” could mean anything in a spectrum of “almost exactly the same” to “could be”.**

**If used, additional information as to why the conclusion is reached is required; for example, similar weight, dimension, construction, materials, etc.**



# Terminology in Report Conclusions and Testimony

“Cannot exclude” may be an accurate conclusion, however in some reports or testimony, using this term without additional qualification could be misleading as to its evidentiary weight.

The jury may interpret the conclusion with much more importance than what the evidence is in the case.

For example, a evidence .38 caliber bullet with no rifling class or identifying features and a submitted .38 revolver. The revolver “cannot be excluded”. What weight would the jury put on such a conclusion?

# Terminology in Report Conclusions and Testimony

## **“Inconclusive”**

**The AFTE Range of Conclusions designate three potential descriptions the degree of agreement in between of identification or exclusion.**

**Using these descriptions of the quality and quantity of agreement to justify an “inconclusive” conclusion helps to ensure that the result is placed in proper perspective and evidentiary weight.**

# Terminology in Report Conclusions and Testimony

**When examination, documentation and reports comport with the standards proposed by ASCLDLAB, ISO, AFTE, and SWGGUN then the consumer of such reports will have a accurate description of the analysis method, observations during the examination, conclusions, the documented support for those conclusions, and the quality measures employed to ensure accuracy.**

**The case documentation and report becomes a de-facto global quality assurance document for the customer.**

# Terminology in Report Conclusions and Testimony

**When the examiner uses his/her report with testimonial support, these standards become imbedded in a complete and accurate court presentation.**

**This makes it practically impossible to “just make a brief report (or few notes) because there will be less information the opposing attorney to attack” or,**

**“The limits of the conclusion is contained in the notes. It’s the lawyers job to ask the right question to find this out” or,**

**Reporting the findings without interpretation assuming that if necessary, it would be presented during testimony.**

# Terminology in Report Conclusions and Testimony

Additionally, a report that employed these standards will aid the attorneys on both sides of the suit in clearly and completely understanding the examiner's work and conclusions.

The report that is produced with these considerations in mind will add to the consumers understanding of the evidence in proper value and perspective.

The testimony from a well documented case file and carefully crafted report will help ensure the trier-of-fact to fully understand the examination results and conclusions