



ATF-LS-FT6 Examination of Toolmarks	Published Online: March 2018
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I. Scope

These guidelines pertain to the examination of toolmarks and their comparison to test marks from suspect tools to determine the possible source. Examinations may include but are not limited to microscopic comparisons between toolmarks and/or test toolmarks from known sources. This protocol is applicable to all ATF Firearm and Toolmark Examiners.

II. References

AFTE Journal, "Toolmark Evidence Examinations, 7D2." 23(2), pp. 716-718.

AFTE Journal, "#F." 16(2), April 1984, pp. 72-74.

AFTE Newsletter Number 10, "Techniques for Making Test Toolmarks Involving a Vise and C-Clamp," October 1970.

ATF Laboratory Services Memo, "Retention based on Test Media," June 4, 1993 regarding test toolmarks, casts of test toolmarks, casts of questioned toolmarks.

Burd, D. and Greene, R. "Toolmark Examination Techniques." *Journal of Forensic Science*. 2(3), July 1957,

Butcher, S. and Pugh, P. "A Study of Marks Made by Bolt Cutters." *Journal of Forensic Science*. 15, 1975.

Davis, J. *Toolmarks, Firearm, and the Striagraph*. CharlesThomas Publisher, 1958

Frazier, R. "Toolmark Test Material." *AFTE Journal*. 7(5), March 1975.

McGuire, D. and Brodie, T. "Standard Toolmark Production Device." *AFTE Journal*. 7(1), March 1975.

Miller, J. "An Introduction to the Forensic Examination of Toolmark." *AFTE Journal*. 33(3), Summer 2001, pp. 233-248.

Miller, J. and Beach, G. "Toolmarks: Examining the Possibility of Subclass Characteristics." *AFTE Journal*. 37(4), Fall 2005, pp. 296-345.

III. Safety Precautions

See ATF-LS-FT8 Firearms Safety Guidelines. When working with sharp or jagged objects, hand and eye protection should be worn.

IV. Apparatus/Reagents

Various substrates for test tool marks, various measuring instruments, casting media and associated materials, stereomicroscope, and comparison microscope.

V. Procedures

See ATF-LS-FT9 Firearm and Toolmark Examination and Identification for minimum required documentation and supplemental documentation depending on the purpose for which the tool/toolmark was submitted for examination.

The condition of the evidence as well as type of substrates on which toolmarks may be present varies sufficiently that each should be considered on its own merit. In general, the following guidelines apply:

- Mark the evidence with identifying marks (if possible and appropriate) in a non-critical location.
- Record the relevant class characteristics of the various toolmarks observed. In the absence of a tool, the class characteristics may be able to provide a basis for the type and potentially the size of the tool that was responsible for making the toolmarks.
- Determine if the marks produced by the tool are suitable for comparison.
- If trace of potential evidentiary value is observed, follow appropriate laboratory guidelines for collection and observation.
- If tools have been submitted, examine the class characteristics of the tools and if similar to examined toolmarks prepare suitable test marks in suitable substrate.
- Evaluate submitted tools for potential of subclass characteristics and consider the potential for impact on comparison and conclusions.

- To compare toolmarks, including toolmarks that have been generated as a result of preparing test marks:
 - Ensure class characteristics are in sufficient agreement to continue forward.
 - Mount the two specimens on separate stages of the comparison microscope. If the specimens are too large, then casts of the respective toolmarks/test marks may be prepared to facilitate examination.
 - Verify compatible magnification.
 - Determine a starting point for the area of interest to be compared.
 - Document observations (AFTE, “Standardization of Comparison Documentation” and ATF-LS-FT10 Photo Documentation of Comparative Examinations). Remember to evaluate for the potential of subclass characteristics.
 - Determine conclusions referring to ATF-LS-FT11 Theory of Identification and Range of Conclusions.
 - If an identification was achieved with a particular test mark, that test mark is to be marked in a manner that will distinguished it from other like test marks. Document the manner in which this marking was done in notes.

VI. Quality Control

Reliable results are ensured when the proper significance is attached to the correspondence of individual marks being observed and equipment used is properly calibrated and maintained.