DEPARTMENT OF JUSTICE
UNIFORM LANGUAGE FOR TESTIMONY AND REPORTS
FOR THE FORENSIC METALLURGY DISCIPLINE

I. Application

This document applies to Department of Justice examiners who are authorized to prepare reports and provide expert witness testimony regarding the forensic examination of metallurgy evidence. This document applies to reports and to testimony based on reports that are finalized after its effective date. Section III is limited to conclusions that result from the comparison of two or more metallurgy items, materials, or processes. Section IV is applicable to all forensic metallurgy examinations unless otherwise limited by the express terms of an individual qualification or limitation.

II. Purpose and Scope[1]

The Uniform Language for Testimony and Reports is a quality assurance measure designed to standardize the expression of appropriate consensus language for use by Department examiners in their reports and testimony. This document is intended to describe and explain terminology that may be provided by Department examiners. It shall be attached to, or incorporated by reference in, laboratory reports or included in the case file.

Department examiners are expected to prepare reports and provide testimony consistent with the directives of this document. However, examiners are not required to provide a complete or verbatim recitation of the definitions or bases set forth in this document. This is supplemental information that is intended to clarify the meaning of, and foundation for, the approved conclusions.

This document should not be construed to imply that terminology, definitions, or testimony provided by Department examiners prior to its effective date that may differ from that set forth below was erroneous, incorrect, or indefensible. It should also not be construed to imply that the use of different terminology or definitions by non-Departmental forensic laboratories or individuals is erroneous, incorrect, or indefensible.

This document does not, and cannot, address every contingency that may occur. For example, an examiner may not have an opportunity to fully comply with this document's directives during a testimonial presentation due to circumstances beyond his or her control. In addition, this document does not prohibit the provision of conclusions in reports and testimony that fall outside of its stated scope. Finally, the substantive content of expert testimony may be dependent upon legal rules imposed by the court or jurisdiction in which it is offered.

[1] This document is not intended to, does not, and may not be relied upon to create any rights, substantive or procedural, enforceable by law by any party in any matter, civil or criminal; nor does it place any limitation on otherwise lawful investigative or legal prerogatives of the Department.

III. Conclusions Regarding Forensic Comparison of Metallurgy Evidence

The examiner may offer any of the following conclusions:

1. Fracture fit
2. Inclusion (i.e., included)
3. Exclusion (i.e., excluded)
4. Inconclusive

Fracture Fit

'Fracture fit' is an examiner's conclusion that two or more metallurgy items or materials were once part of the same object. This conclusion is an examiner's decision that two or more metallurgy items or materials show sufficient correspondence between their observed characteristics to indicate that they once comprised a single object and insufficient disagreement between their observed characteristics to conclude they originated from different objects. This conclusion can only be reached when portions of two or more metallurgy items or materials physically fit together.

The basis for a 'fracture fit' conclusion is an examiner's decision that the observed characteristics of the items or materials provide extremely strong support for the proposition that they were once part of the same object and extremely weak support for the proposition that the items or materials originated from different objects.

A 'fracture fit' conclusion is the statement of an examiner's opinion (an inductive inference[2]) that the probability that the items or materials were not part of the same object is so small that it is negligible. A 'fracture fit' conclusion is not based upon a statistically-derived or verified measurement or an actual comparison to all metallurgy items or materials in the world.

Inclusion

'Inclusion' is an examiner's conclusion that two or more metallurgy items or materials could have originated from the same source or process. An examiner may conclude that two or more items or materials originated either from the same metallurgy source or process or from another source or process that is substantially similar to the examined items or materials in all observed characteristics.

---

[2] Inductive reasoning (inferential reasoning):

> A mode or process of thinking that is part of the scientific method and complements deductive reasoning and logic. Inductive reasoning starts with a large body of evidence or data obtained by experiment or observation and extrapolates it to new situations. By the process of induction or inference, predictions about new situations are inferred or induced from the existing body of knowledge. In other words, an inference is a generalization, but one that is made in a logical and scientifically defensible manner.

OXFORD DICTIONARY OF FORENSIC SCIENCE 130 (Oxford Univ. Press 2012).

An item or material may be included within a broad general population of items or materials (such as those which are mass-produced), or to a less frequently encountered population of items or materials, based on their physical and chemical characteristics. This limitation must be explained when an examiner reports and testifies that an item or material is included within a broad, general population of substantially similar items or materials.

The basis for an 'inclusion' conclusion is an examiner's decision that two or more items or materials exhibit substantially similar observed characteristics with no unexplainable differences.

Exclusion
'Exclusion' is an examiner's conclusion that the metallurgy items or materials could not have originated from the same source or process.

The basis for an 'exclusion' conclusion is an examiner's decision that two or more items or materials exhibit substantially dissimilar observed characteristics that would not be expected from items or materials that originated from the same source or process.

Inconclusive
'Inconclusive' is an examiner's conclusion that no determination can be reached as to whether two or more metallurgy items or materials could have originated from the same source or process.

The basis for an 'inconclusive' conclusion is an examiner's decision that there is an insufficient quantity and/or quality of observed characteristics to determine whether two or more items or materials could have originated from the same source or process.

IV. Qualifications and Limitations of Forensic Examination of Metallurgy Evidence

- An examiner shall not assert that two or more metallurgy items or materials were once part of the same object unless portions of two or more items or materials physically fit together.

- When offering a 'fracture fit' conclusion, an examiner shall not assert that the fragments originated from the same object to the exclusion of all other metallurgy sources. This may wrongly imply that a 'fracture fit' conclusion is based upon a statistically-derived or verified measurement or actual comparison of the items or materials to all other metallurgy sources in the world, rather than an examiner's expert opinion.

- An examiner shall not offer an 'inclusion' conclusion unless he or she explains that the examined items or materials could also have originated from another metallurgy source or process that exhibits the same observed characteristics. When an 'inclusion' is made to a broad general population of items or materials (such as mass-produced items), an examiner shall explain that the chance of finding coincidentally indistinguishable materials may be high. As the population of items or materials narrows, an examiner shall explain that the chance of finding coincidentally indistinguishable materials may decrease.

- An examiner shall provide the strength of agreement between two or more metallurgy items, materials, or processes, based on reference to relevant data, in reports and testimony. If relevant data is unknown, this limitation must be explained in reports and testimony.

- An examiner shall not assert that forensic metallurgy examinations are infallible or have a zero error rate.

- An examiner shall not provide a conclusion that includes a statistic or numerical degree of probability except when based on relevant and appropriate data.

- An examiner shall not cite the number of forensic metallurgy examinations performed in his or her career as a direct measure for the accuracy of a proffered conclusion. An examiner may cite the number of forensic metallurgy examinations performed in his or her career for the purpose of establishing, defending, or describing his or her qualifications or experience.

- An examiner shall not use the expressions 'reasonable degree of scientific certainty,' 'reasonable scientific certainty,' or similar assertions of reasonable certainty in either reports or testimony unless required to do so by a judge or applicable law.[3]

[3] *See Memorandum from the Attorney General to Heads of Department Components* (Sept. 9. 2016), https://www.justice.gov/opa/file/891366/download.