# FBI Approved Standards for Scientific Testimony and Report Language for Forensic Glass Comparisons

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## 1 PURPOSE

This document provides examples of scientifically-supported conclusions and opinions approved for reporting examination conclusions and offering expert opinion statements during testimony by Geologist-Forensic Examiners conducting forensic glass comparisons within the Geology Group of the Trace Evidence Unit (TEU). These examples are not intended to be all inclusive. The actual statements that may be provided in a particular case may be subject to prior legal precedent in the locality in which a testimony is provided. Further, these examples are not intended to serve as requirements for other forensic laboratories and do not imply that statements by other forensic laboratories are incorrect, indefensible, or erroneous. Explanations supporting the statements contained in this document can be found in the FBI Laboratory Quality Assurance Manual (LAB-100), FBI Laboratory Operations Manual (LAB-200), Trace Evidence Unit Quality Manual (TRACE-100), Trace Evidence Technical Procedures, and current reliable references.

## 2 SCOPE

This document applies to Geologist-Forensic Examiners within the TEU Geology Group who prepare FBI *Laboratory Reports* (7-1 or 7-1 LIMS) and/or provide testimony in the area of forensic glass analysis.

## 3 STATEMENTS APPROVED FOR FBI TEU GEOLOGY GROUP FORENSIC GLASS COMPARISON TESTIMONY AND/OR LABORATORY REPORTS

For additional guidance on report writing, see the TRACE-100: Quality Manual.

A. Fracture Fit: An Examiner may assert that the glass fragments were once part of the same broken object. This conclusion can only be reached when two or more pieces of broken glass physically fit together and show sufficient correspondence between their macro- and microscopic characteristics to indicate they once comprised a single object, and insufficient disagreement between their macro-and microscopic characteristics to conclude that they originated from different objects.
B. Inclusion: An Examiner may assert that the glass fragments either originated from the same broken glass source or from another source(s) of broken glass with indistinguishable characteristics. This conclusion may be reached with or without elemental composition.
    1. Inclusion with Elemental Composition Examination: If elemental composition data has been acquired, an Examiner may conclude that two or more glass fragments either originated from the same broken glass source or from another source that is indistinguishable in all assessed physical characteristics, refractive index, and elemental composition. Such conclusions may include probabilities based on appropriate databases or documented frequencies.
    2. Inclusion with No Elemental Composition Examination: If elemental composition data has not been acquired, an Examiner may conclude that two

or more glass fragments either originated from the same broken glass source or from another source that is indistinguishable in all assessed physical characteristics and refractive index. Such conclusions may include probabilities based on appropriate databases or documented frequencies. When elemental composition data has not been acquired, an examiner shall report and explain that the chance of finding glass that is coincidentally indistinguishable in all assessed characteristics is significantly higher than when it is acquired.

C. Exclusion: An Examiner may assert that two or more glass fragments are excluded as having originated from the same broken glass source. This conclusion is reached when two or more fragments of glass are different in their assessed physical properties, refractive indices or elemental composition.
D. Inconclusive: An Examiner may assert that no determination can be reached as to whether two or more glass fragments could have originated from the same source of broken glass. This conclusion can be reached when a glass fragment is too limited in size or quality.
E. An Examiner may cite the number of forensic glass examinations performed in their career for the purpose of establishing, defending, or describing their qualifications or experience.

## 4 Statements Not Approved For FBI TEU Geology Group Forensic Glass Comparisons Testimony and/or Laboratory Reports

An Examiner shall not assert that two or more broken glass fragments were once part of the same object unless the broken glass fragments physically fit together.

A. When offering a “fracture fit” conclusion, an Examiner shall not assert that the fragments originated from the same broken glass object to the exclusion of all other broken glass sources.
B. An examiner shall not use the terms “individualize” or “individualization” when describing a “fracture fit” conclusion.
C. An examiner shall not assert that a “fracture fit” conclusion is based on the “uniqueness” of an item of evidence.
D. An Examiner shall not offer an “inclusion” conclusion unless they explain that the glass fragments could also have originated from another broken glass source(s) that is indistinguishable in all assessed characteristics.
E. An Examiner shall not assert that forensic glass examinations are infallible or have a zero error rate.
F. An Examiner shall not provide a conclusion that includes a statistic or numerical degree of probability except when based on relevant and appropriate data.
G. An Examiner shall not cite the number of forensic glass examinations performed in their career as a direct measure for the accuracy of a proffered conclusion.
H. An Examiner shall not use expressions “absolute certainty,” “100% certainty,” “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.

## 5 Laboratory Report Reviews

The content of a TEU Geology Group *Laboratory Report* will be reviewed per the appropriate LAB-200: Operations Manual practices and the TRACE-100: Quality Manual to ensure compliance with the approved statements in this document.

## 6 Testimony Reviews

TEU Geology Group testimonies will be reviewed following the LAB-100: Quality Assurance Manual. The review will assess the testimony for compliance with the statements in this document.

## 7 References

LAB-100: Quality Assurance Manual, FBI Laboratory (current version)

LAB-200: Operations Manual, FBI Laboratory (current version)

TRACE-100: Quality Manual, Trace Evidence Unit, FBI Laboratory (current version)

Department of Justice Uniform Language for Testimony and Reports (ULTR) for the Forensic Glass Discipline (current version)

## 8 Revision History

| Revision | Issued | Changes |
|---|---|---|
| 03 | 08/17/2020 | Section 3.2 added. Previous Sections 3.2 through 3.5 renumbered to 3.3 through 3.6. Sections 4.3 and 4.4 added. Previous Sections 4.3 through 4.7 renumbered to 4.5 through 4.9. Additional prohibited phrases added to Section 4.9 |
| 04 | 01/28/2022 | Reformatted document.<br>Updated referenced document names. |
| 05 | 01/02/2025 | Removed fracture fit exclusion. |