

PHYSICAL MATCH EXAMINATION**20.1 PURPOSE:**

The physical match of two items of evidence is the simplest method in establishing commonality between the items. When the fractured edges of two items are matched, the common origin of the pieces is definitive.

20.2 RESPONSIBILITY:

Forensic Science Examiners from the Division of Scientific Services who have been trained in the discipline of physical match examination according to FB SOP-26 (Training Manual and Checklist) and GL-4 (LIMS/JusticeTrax)

20.3 SAFETY

Use appropriate measures for the proper handling of biohazardous materials and hazardous chemicals according to GL-2 (Safety Manual).

20.4 DEFINITIONS:

LIMS: Laboratory Information System

20.5 PROCEDURE**20.5.1: Materials**

- A. Magnifying device (i.e. lens, stereomicroscope, compound microscope)
- B. Digital imaging device

20.5.2 Examination

- A. Physical evidence will be examined based on the submitting agencies request, case information, condition of the evidence, as well as the examiner's knowledge, training and experience. See also FB SOP-1 (Physical Evidence Examination).
- B. Evidence will be examined in such a manner as to prevent the loss or contamination of the evidence.
- C. Digital images (with scale) will be taken, documenting the general physical characteristics (i.e. class characteristics). Such class characteristics may include color, texture, pattern and composition. Similarities/differences of all evidentiary items of evidence will be documented.

- D. The examiner will use their training and experience to choose a suitable magnifying device (if any) to examine/compare the evidence submitted.
- E. Topical debris, which may be adhering to the evidence, may be removed prior to the side-by-side examination of the evidentiary items.
- F. The examiner will determine if the items of evidence are fractured and whether or not they are in suitable condition to be physically realigned.

20.5.3 Comparison

- A. Two or more items of evidence will be assessed side-by-side. If two or more evidentiary items have no discernable difference in class characteristics and can be joined with no significant differences at the margins, then the two items are consistent with once having been one continuous piece (i.e. are a physical match).
- B. The margins of the physical match will be photo-documented at the appropriate magnification.
- C. A second qualified examiner will confirm the physical match. They may observe the actual evidence or may review the photo-documentation.
 - a. If this examiner concurs with the determination of the physical match, then she/he will initial the appropriate Quality Record Worksheet to indicate the agreement.
 - b. If this examiner does not concur with the determination of the physical match, then a third qualified examiner will be consulted.
 - c. A determination of physical match or no physical match will be made between the first, second and third examiners. This determination will be recorded, along with the concerns of the second examiner and the reasoning behind the final determination, on the appropriate Quality Record Worksheet. All parties will initial this documentation.
- D. When a physical match is confirmed, the examiner will re-evaluate the case scenario to determine if further requested testing/examination is necessary.

20.5.4 Itemization and Disposition

- A. Sub-items may be created and transferred in the LIMS system according to GL-4 (LIMS/JusticeTraxSystem), GL-5 (Ethics) and FB SOP-1.5.5. when necessary.
1. If other forensic examination is necessary, the examiner will forward some or all of the evidence to the appropriate Laboratory Unit.
 2. The examiner will determine if some or all of the examined evidence should be retained at the Laboratory or returned to the Submitting Agency. Some factors used in making this determination may be the size and fragility of the evidence.

20.5.5 Report Writing

- A. To complete case paperwork and write a report of examination and results see FB SOP-5 (Case Records and Reports). Suggested report wording is as follows:
- B. *Dissimilar class characteristics (no physical match examination necessary):*
1. Submission #1 (“portion of plastic in roadway”) consisted of a green portion of rubber-type material measuring approx...
 2. Submission #2 (“front bumper of SUV”) consisted of a ridged black plastic-type vehicle bumper measuring approx...
 3. Submission #1 was found to be visually dissimilar in color, texture and pattern to submission #2, therefore no physical match examination was conducted. (or: no further examination was conducted.)
- C. *Similar class characteristics – Negative physical match:*
1. Submission #1 (“portion of plastic in roadway”) consisted of ridged black plastic-type material measuring approx...
 2. Submission #2 (“front bumper of SUV”) consisted of a ridged black plastic-type vehicle bumper measuring approx...
 3. Submission #1 and submission #2 were found to be visually similar in color, texture and pattern.
 4. Submissions #1 and #2 could not be physically fit to each other.
 5. Submissions #1 and #2 were forwarded to the Chemistry Unit for further analysis.
- D. *Similar class characteristics – Positive physical match:*
1. Submission #1 (“portion of plastic in roadway”) consisted of ridged black plastic-type material measuring approx...
 2. Submission #2 (“front bumper of SUV”) consisted of a ridged black plastic-type vehicle bumper measuring approx...

3. Submission #1 and submission #2 were found to be visually similar in color, texture and pattern and could be physically fit to each other. Therefore, submission #1 and submission #2 were once one continuous piece. (or: once part of the same item.)
- or
4. Submission #1 and submission #2 could be physically fit to each other. Therefore, submission #1 and submission #2 were once one continuous piece. (or: once part of the same item.)

20.6 REFERENCES

- A. Bell and Morris, An Introduction to Microscopy, CRC Press, 2010.
- B. DeForest, Gaensslen and Lee, Forensic Science, An Introduction to Criminalistics, McGraw-Hill, 1983.
- C. ASTM International, Publication Designation E 2288-03, *Standard Guide for Physical match of Paper Cuts, Tears, and Perforations in Forensic Document Examination*, 2003
- D. GL-2 (Safety Manual)
- E. GL-4 (LIMS/Justice Trax System)
- F. GL-5 (Ethics)