Purpose: Procedure for Non-destructive Examination of Paper

These procedures provide guidance to forensic document examiners for the nondestructive examinations of paper. These procedures are applicable whether the examination is of Questioned and Known items or of exclusively Questioned items. By following these procedures, a forensic document examiner can reliably evaluate the physical similarities or differences between papers that can lead to a determination as to whether papers originated from the same source.

Certain items of evidence submitted for examination may have inherent limitations that can interfere with these procedures. Limitations should be noted and recorded on the QR DOC-2 or case notes. The condition of a paper sample may make it unsuitable for some types of examinations (for example, item(s) that are water soaked, stained, soiled, charred, or finely shredded). Additionally, storage conditions such as exposure to light, heat, or moisture can affect the appearance of paper during certain tests.

It should be noted that in the paper manufacturing process, reams of paper and other paper products can be comprised of sheets from one or more rolls of paper. Differences in paper characteristics may be present in individual sheets from the same ream or product and, therefore, must be considered when assessing color, thickness, UV fluorescence, IRL, opacity, surface texture and printed material.

Responsibility:

Forensic Science Examiners assigned to the Questioned Documents Unit or performing casework in the Unit

Equipment:

1. Lighting (natural, fluorescent) and alternate light sources
   Lighting may include the use of transmitted, side or vertical lighting to improve the ability to view fine details.
2. Stereomicroscopes with fiber-optic lighting
3. Scanners
4. Cameras
5. Measuring devices - Micrometer capable of measuring in increments of 0.02 mm or 0.001 inch. Ruler measuring at least 300 mm long, marked in increments of 0.5 mm or less, or measuring at least 12 in. long, marked in increments of 1⁄64 in. or less.
6. Scale capable of measuring 0.001 g.

7. IR image conversion device or system with appropriate light sources and filters for use in IR and IRL examinations.
8. ESDA device
9. UV light source

Procedure:

The Questioned Document Unit will usually be the first Unit to receive document-type evidence for analysis. In the event that another Unit examined this evidence first, it should be understood that there may be analysis methods that may limit the examination on these documents. Prior handling, testing, or chemical processing (for example, for latent prints) or swabbing of a document may interfere with the ability of the examiner to see certain characteristics.

1. Beginning of examination: Refer to QD SOP-3 for guidance on transferring, LIMS documentation and evidence identification.

2. All examination steps, relevant observations, and results shall be documented on QR-DOC-2 and/or case notes. If the examiner notes that the submitted evidence is of limited quality or quantity, the examiner or Case Management Unit may need to contact the submitting agency to acquire more evidence. If it is noted that the evidence received has been handled or chemically treated that limits or prevents the examination, the submitting agency may be contacted to communicate this information. (see GL20)

3. During the examination procedure, the examiner may use different types of lighting and magnification (such as stereomicroscopes) to examine the documents and the writing present on the documents. The documents may be scanned or photographed to preserve the writing and for incorporation into the case notes.

4. At various points in these procedures, a determination that a particular feature is not present or that an item is lacking in quality or comparability may indicate that the examiner should discontinue or limit the procedure(s). It is at the discretion of the examiner to discontinue the procedure at that point and report accordingly or to continue with the applicable procedures to the extent possible. The reasons for such a decision shall be documented.

5. Determine whether the examination is a comparison of Questioned paper sample(s) or a comparison of a Questioned paper sample(s) with a Known paper sample(s).

6. Determine whether the submitted paper samples are suitable for comparison. If not suitable for comparison, discontinue the procedure and report accordingly.

7. Examine the paper samples with transmitted light. Record any watermarks, if present. When identifying a manufacturer or dating a paper sample by the use of a watermark, refer to laboratory and published industry resources. If necessary, contact the appropriate paper manufacturer for further information.

8. Examine the color of the paper samples. Determine the significance of any differences observed.

9. Measure the thickness of the paper samples with a micrometer. An averaging of measurements made at the center and opposite edges of each paper sample, is recommended.

10. Examine the paper samples for UV fluorescence and IRL.

11. Examine the samples for chemical or other contamination, alterations, and carbonless paper transfers.

12. Examine the relative opacity of the paper samples.

13. Examine the surface texture of the paper samples (for example, smoothness, patterns).

14. Measure the paper samples with a ruler, recording length and width measurements.

15. Measure the weight of the paper sample. The relative basis weight can be compared by dividing the weight of the paper by its area.

16. Examine corners of the paper samples and evaluate angles (for example, squared, curved, rough finish).

17. Examine edges of the paper samples with magnification, or UV sources, or both for remnants of binding, adhesives, or padding material.

18. Examine edges of the paper samples for manufacturing markings (for example, cut marks, striations or coloration). Evaluate for proper orientation of each page with all other pages.

19. Examine paper samples with lines or other printed material with appropriate instruments capable of magnification, IR, IRL, and UV examinations. Measure line length, spacing, and other printed material. Examine for broken or deformed patterns.

20. Examine the paper samples for the presence of security features (for example, planchettes or security fibers).

21. Examine the samples for carbonless paper chemicals and form printing image quality that can indicate a carbonless system.

22. Locate and record any trace materials (for example, opaqueing solution, correction strips, tape, or other materials) on the paper samples.

23. Examine the paper samples for surface damage due to abrasions, handling, storage, or other physical changes. If folds, creases, crimp markings, fiber disturbances, or other relevant characteristics, are located on any sample, determine the significance as they relate to other samples.

24. Examine the paper samples for size and spacing of staples and staple holes. If the pages of the documents are stapled together, determine any pattern similarities or differences between the number and pattern of staple holes present.

    Prior to the removal of any staples, record the position of the staple holes relative to the existing staple(s). Coordination with the submitter of the evidence may be needed before removing any staples.

25. Examine the paper samples for perforations, hole punches, or other torn portions.

26. Examine the surfaces of the paper for indentations such as handwriting, clipboard marks, paper clip impressions, and other extraneous markings.

27. Evaluate similarities, differences, and limitations in the documents examined. Determine their significance individually and in combination and reach a conclusion. The basis for the examiners opinions should be located in the case notes and also expressed in the final report.

28. Once examinations and evaluations have been completed, reports may include, but are not limited to, the following types of conclusion(s), opinion(s), or finding(s):
    1) Evidence such as indentations, contaminants, physical similarities, etc., associates the paper evidence samples as being attached, handled by, or originating from the same source.

2) The paper samples originate from or share the same manufacturer source (mill, post-mill processing, binding, printing, trimming, packaging and distribution processes) or post-manufacturer source (consumer or user level).

3) The paper samples can neither be associated nor disassociated as originating from or sharing the same source.

4) The paper samples did not originate from or share the same source.

5) Evidence such as indentations, contaminants, physical similarities, etc., associates the paper samples as being attached, handled by, or originating from the same source.

Sources of Error: Not applicable

References:

SWGDOC Standard for Non-destructive Examination of Paper ver. 2013-1