Laboratory Services Questioned Documents

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1. Scope

    1.1. To determine, if possible, whether a specific writer wrote questioned handwritten or hand printed material.

2. Instrumentation

    2.1. Stereoscopic microscope and/or hand magnifier

    2.2. Light sources

    2.3. Photocopier

    2.4. Scanner

3. Safety Considerations

    3.1. Take appropriate procedures when evidence is contaminated with body fluids or otherwise contaminated. Items should be handled in a manner that prevents examiner exposure and preserves DNA (if requested by the submitter).

    3.2. When handling a contaminated document, the examiner must wear a lab coat and examination gloves. The gloves must be placed in a properly labeled biohazard container after the examination is concluded.

4. Procedures

    4.1. Specimen(s)

        4.1.1. An item containing an unknown/questioned handwritten or hand printed entry.

        4.1.2. Sufficient known standards/writings of each individual suspect to be compared.

    4.2. Supplies Required

        4.2.1. Paper, pen, photocopies of evidence

    4.3. Procedure

        4.3.1. The method for conducting a handwriting/hand printing examination will generally include the procedures detailed in ANSI/ASB 070, First Edition, 2022, Standard for Examination of Handwritten Items. Any deviations from these procedures will be documented in the case record. The general steps to be accomplished are listed in the paragraphs below.

        4.3.2. It will be determined by the examiner on a case-by-case basis if the quality of photocopied and/or photographed evidence (both known and questioned) contains sufficient detail to support any of the opinions that may be rendered.

4.3.3. It is the responsibility of the submitter to authenticate a suspect's collected standards (e.g., such as those received from a business, school, or social environment). In the absence of evidence to the contrary, collected standards are accepted by the document examiner as known writing of a particular writer. If at any point it is revealed that one or more standards cannot be authenticated, any final report issued based on those standards becomes null and void and a new examination, if required, may be conducted based on the remaining evidence.

4.3.4. Separate items into questioned writing and known writing categories. This does not necessarily involve a physical separation. In some circumstances the questioned and known writing may be on the same document.

4.3.5. Mark the evidence or the proximal container with the exhibit number, case number, and initials.

4.3.6. If there is more than one questioned item, cross-compare them with each other for evidence of a single author.

4.3.7. Using microscopic and macroscopic examination, examine in detail the questioned writing assessing both class and individual characteristics.

4.3.8. Intercompare the known writing specimens for each author to determine if there is evidence that the known writing was written by more than one writer.

4.3.9. Using microscopic and macroscopic examination, examine the known writing assessing both class and individual characteristics.

4.3.10. Some of the possible individualizing characteristics include the general writing style, slant, line quality, line shading or pen pressure, relationships and proportion of letters and words, spacing, initial and final strokes, pen lifts, alignment, direction of strokes, method of formation of letters, punctuation, drag marks, and retouching or patching. This is not an all-inclusive list.

4.3.11. Compare each questioned item with each set of known writings assessing the similarities as well as the dissimilarities that appear in the writing, weighing the significance of each that are observed.

4.3.12. Make written notes of the representative sample of the significant characteristics of the evidence documenting similarities and dissimilarities of each item. The notes may be on copies of the evidence, worksheets, drawings, or verbally described. The bases and reasons for conclusion(s), opinion(s), or finding(s) should be included in the case record.

4.3.13. Formulate an opinion based on all the evidence examined. Record opinion(s) in a laboratory report. Any limitations resulting in less than conclusive opinions should also be included in the report.

5. Quality Assurance and Controls

5.1. The opinions given must be verified by another qualified forensic document examiner. The verification will be documented in the case record.

5.2. The case record will be technically reviewed by another qualified forensic document examiner.

5.3. The case record will be administratively reviewed by a supervisor or acting supervisor.

5.4. The examiner, technical reviewer, and administrative reviewer will complete a case record review form.

6. References

6.1. ANSI/ASB 070, First Edition, 2022, Standard for Examination of Handwritten Items.

6.2. United States Department of Justice Uniform Language for Testimony and Reports for Forensic Document Examination (effective 7/5/21).

6.3. Conway, James V. P., Evidential Documents, Charles C. Thomas, Publisher, Springfield, Illinois, 1972.

6.4. Harrison, Wilson R., Suspect Documents: Their Scientific Examination, Swed & Maxwell Limited, London, England, 1966.

6.5. Lindblom B., Kelly J. Scientific Examination of Questioned Documents 2nd Ed., Taylor & Francis Group, Boca Raton, FL, 2006.

6.6. Osborn, Albert S., Questioned Documents, Nelson-Hall Inc., Chicago, Illinois, 1929.

1. Scope:

   1.1. To determine, if possible, whether a particular typewriter was used to make questioned typewritten entries.

   1.2. To identify, if possible, the make/model, of a typewriter used to make questioned typewritten entries.

   1.3. To determine, if possible, dating information regarding the typewriting/typewriter.

2. Instrumentation:

   2.1. Stereo-binocular microscope and hand magnifier

   2.2. Typewriter alignment grids or plates

   2.3. Computer with scanner, photocopier

   2.4. Reference material such as the FBI Type Styles Manuals and the Haas Typewriter Atlases (Pica and Non-Pica)

3. Safety Considerations

   3.1. Take appropriate procedures when evidence is contaminated with body fluids or otherwise contaminated. Items should be handled in a manner that prevents examiner exposure and preserves DNA (if requested by the submitter).

   3.2. When handling a contaminated document, the examiner must wear a lab coat and examination gloves. The gloves must be placed in a properly labeled biohazard container after the examination is concluded.

4. Procedures

   4.1. Specimen(s)

      4.1.1. A document/item bearing a questioned typewritten entry

      4.1.2. Known standards from a suspect typewriter (if applicable)

      4.1.3. A suspect typewriter (if applicable)

      4.1.4. Typewriter ribbon (if applicable)

   4.2. Procedure

      4.2.1. The method for conducting an examination of typewriter evidence will generally include the procedures detailed in the Scientific Working Group for Document Examination (SWGDOC) Standard for Examination of Typewritten Items. Any

deviations from these procedures will be documented in the case record. The general steps to be accomplished are listed in the paragraphs below.

4.2.2. It will be determined by the examiner on a case-by-case basis if the quality of photocopied and/or photographed evidence (both known and questioned) contains sufficient detail to support any of the opinions that may be rendered.

4.2.3. Mark the evidence or the proximal container with the exhibit number, case number, and initials.

4.2.4. Visual examination and measurements of the questioned typewritten entry(ies) are taken (all measurements are approximate).

4.2.5. When applicable, attempt to classify the questioned typewritten entry using available reference material.

4.2.6. Examine the questioned typewritten entry using typewriter grids or plates to determine alignment, pitch, and line spacing.

4.2.7. Examine the questioned typewriter/typewritten entries for alignment and typeface defects.

4.2.8. Using a stereo-binocular microscope, examine the questioned typewritten entries. Take note of any defects.

4.2.9. If a known typewriter is submitted, the individual typeface on the machine should be examined for class and individual characteristics.

4.2.10. Remove the typewriter ribbon/cartridge from the typewriter if present and assign it a sub-exhibit number. Any exemplars taken from the suspect typewriter are also assigned sub-exhibit numbers. If requested, the typewriter ribbon should be read following the procedure in ATF-LS-QD3 Typewriter Ribbon Examination.

4.2.11. If a known typewriter standard for the questioned typestyle is available, it should be examined for class characteristics.

4.2.12. Compare the questioned typewritten entry with the set of known typewriting assessing the similarities as well as dissimilarities.

4.2.13. Formulate an opinion based on all the evidence examined.

4.3. Documentation:

4.3.1. The bases and reasons for the conclusion(s), opinion(s), or finding(s) should be included in the examiner's case notes, which may include notes on copies of the evidence.

4.3.2. Copies of a representative sample of documents which bear the significant characteristics of the evidence should be made. Measurements from test grids, if used, should also be included. Case notes should include the equipment and/or procedures used, the identifying or eliminating features, and the results of analysis.

4.3.3. Record findings in the case notes and report the results in a laboratory report.

5. Quality Assurance and Controls

5.1. The opinions given must be verified by another qualified forensic document examiner. The verification will be documented in the case record.

5.2. The case record will be technically reviewed by another qualified forensic document examiner.

5.3. The case record will be administratively reviewed by a supervisor or acting supervisor.

5.4. The examiner, technical reviewer, and administrative reviewer will complete a case record review form.

6. References

6.1. SWGDOC Standard for Examination of Typewritten Items

6.2. Typewriter Type Styles Manual, Volumes 1 and 2, Federal Bureau of Investigation, undated (FBI Type Styles Manual).

6.3. Haas, Bernhard, Atlas de Schreibmaschinenschrift, Non-Pica, 1972 (Haas Typewriter Atlas Non-Pica).

6.4. Haas, Bernhard and Haas, Josef, Atlas de Schreibmaschinenschrift, Pica, 1985 (Haas Typewriter Atlas - Pica).

6.5. ATF-LS-QD3 Typewriter Ribbon Examination.

6.6. Hilton, Ordway, Scientific Examination of Questioned Documents Rev. Ed, Elsevier Science Publishing Co., Inc., New York, New York, 1982.

6.7. Kelly, Jan and Lindblom, Brian (eds.), Scientific Examination of Questioned Documents, Second Ed., CRC Press, Boca Raton, FL, 2006.

1. Scope

   1.1. To locate and decipher typewritten text on a questioned single-strike film ribbon (typewriter ribbon).

   1.2. To link text located on a typewriter ribbon to the text on a document.

2. Instruments

   2.1. Stereomicroscope (or possibly a comparison microscope)

   2.2. Hand magnifier

   2.3. Transmitted light box

   2.4. 8mm and 16mm film reels

   2.5. Holder for film reels

   2.6. Poly-encapsulation material

3. Safety Considerations

   3.1. Take appropriate procedures when evidence is contaminated with body fluids or otherwise contaminated. Items should be handled in a manner that prevents examiner exposure and preserves DNA (if requested by the submitter).

   3.2. When handling a contaminated document, the examiner must wear a lab coat and examination gloves. The gloves must be placed in a properly labeled biohazard container after the examination is concluded.

4. Procedures

   4.1. The method for conducting an examination of a typewriter ribbon will generally include the procedures detailed in the Scientific Working Group for Document Examination (SWGDOC) Standard Guide for Examination of Fracture Patterns and Paper Fiber Impressions on Single-Strike Film Ribbons and Typed Text; and the SWGDOC Standard for Examination of Typewritten Items. Any deviations from these procedures will be documented in the case record. The steps below provide a general framework of the examination process, and to some degree, supplement the information provided in the standards.

   4.2. Remove ribbon cartridge from typewriter (if the ribbon was shipped in a typewriter).

   4.3. Mark the evidence or the proximal container with the exhibit number, case number, and initials.

4.4. Remove ribbon from inside cartridge. This usually requires breaking the cartridge apart. Single-strike film ribbons are fragile. The ribbon should be held with the tips of the fingers while avoiding areas where typewritten impressions are located. The ribbon should not be stretched.

4.5. Cut the used part of the ribbon away from the ribbon bearing the text. Leave a small section of unused ribbon on the part to be examined. Attach this portion of the ribbon to an appropriately sized film reel. Unwind the used ribbon from the original reel to the film reel (if film reels are unavailable, the ribbon can still be read). This process places the beginning of the text into the proper place to begin the examination. Do not over tighten. Use additional reels if necessary.

4.6. Examine the ribbon for the questioned typewritten text. Some ribbons have a single row and can be read straight across. Some ribbons have more than one line of text and are read one column at a time from top to bottom. If the questioned text is found, make photographs or scanned images. At the examiner's discretion, it may be helpful to poly-encapsulate the sections of the ribbon bearing the questioned entries.

4.7. If a correction ribbon is submitted, examine the correction ribbon to account for any corrections that were found of the film ribbon.

4.8. If the questioned text is located, examine the carbon transfer from the ribbon to the paper for a possible physical fit of the transferred carbon to the carbon remaining on the ribbon. Also, using a stereomicroscope (or possibly a comparison microscope), examine the ribbon for impressions of paper fibers on the ribbon film that may agree with the paper fibers on the questioned document.

4.9. Make case notes regarding the actions taken and any findings.

4.10. Formulate an opinion based on all the evidence examined.

4.11. Record findings in written form and have the results recorded on a formal laboratory report. If the questioned text is located on the ribbon, that section of the ribbon should be transcribed into the final report.

4.12. The bases and reasons for the conclusion(s), opinion(s), or finding(s) should be included either on the examiner's worksheet or on photocopies and may be also included in the report.

5. Quality Assurance and Controls

5.1. The opinions given must be verified by another qualified forensic document examiner. The verification will be documented in the case record.

5.2. The case record will be technically reviewed by another qualified forensic document examiner.

5.3. The case record will be administratively reviewed by a supervisor or acting supervisor.

5.4. The examiner, technical reviewer, and administrative reviewer will complete a case record review form.

6. References

6.1. SWGDOC Standard Guide for Examination of Fracture Patterns and Paper Fiber Impressions on Single-Strike Film Ribbons and Typed Text.

6.2. SWGDOC Standard for Examination of Typewritten Items.

6.3. Hahn, G. H. "Paper Fiber Impressions in Carbon Type Ribbons" Journal of Forensic Sciences, Volume 19, Number 1, January, 1974.

6.4. Hilton, Ordway, Scientific Examination of Questioned Documents, Elsevier Science Publishing Co., Inc., New York, New York, 1982.

6.5. Hilton, Ordway, "Identifying the Typewriter Ribbon Used to Write a Letter, A case Study Employing New Techniques" Journal of Criminal law, Criminology and Police Science, Volume 63, Number 1, March, 1972.

1. Scope

   1.1. To determine, if possible, whether a particular machine (e.g., photocopier, printer, or multifunction machine), was used to produce a questioned copy.

2. Instruments

   2.1. Stereobinocular microscope and/or hand magnifier

   2.2. Light sources to include transmitted light box

   2.3. Photocopier

   2.4. Scanner

3. Safety Considerations

   3.1. Take appropriate procedures when evidence is contaminated with body fluids or otherwise contaminated. Items should be handled in a manner that prevents examiner exposure and preserves DNA (if requested by the submitter).

   3.2. When handling a contaminated document, the examiner must wear a lab coat and examination gloves. The gloves must be placed in a properly labeled biohazard container after the examination is concluded.

4. Procedures

   4.1. The method for conducting the examination of machine copies will generally include the procedures detailed in Scientific Working Group for Document Examination (SWGDOC) Standard Guide for Examination of Documents Produced with Toner Technology. If it is determined that the copy was made by inkjet technology, use the SWGDOC Standard for Examination of Documents Produced with Liquid Ink Jet Technology. Any deviations from these procedures will be documented in the case record. The general steps to be accomplished are listed in the paragraphs below.

   4.2. It will be determined by the examiner on a case-by-case basis if the quality of copy evidence (both known and questioned) contains sufficient detail to support any opinion that may be rendered.

   4.3. It is the responsibility of the submitter to authenticate collected standards (e.g., such as those received from a business, school, or social environment). In the absence of evidence to the contrary, collected standards are accepted by the document examiner as known samples. If at any point it is revealed that one or more standards cannot be authenticated, any final report issued based on those standards becomes null and void and a new examination, if required, may be conducted based on the remaining evidence.

4.4. Mark the evidence or the proximal container with the exhibit number, case number, and initials.

4.5. Conduct macroscopic and microscopic examinations of the questioned copy, the original document (if available), and any known standards and/or exemplars from a suspect machine.

4.6. Examine the suspect machine or machine parts if submitted.

4.7. Identify any class characteristics of the questioned copy, and all known copies, to include application method (e.g., monochrome dry toner, liquid toner, full-color toner, inkjet).

4.8. Compare the questioned copy to the original document and then compare both to all known photocopies to determine similarities as well as dissimilarities to include roller bar marks, picker bar marks, drum marks, and trash marks on the platen.

4.9. Examine full-color copies for an encoded pattern which may be present and could be used to trace the serial number of the machine through the manufacturer.

4.10. Make written notes of the procedures used, pertinent observations, and any similarities and/or dissimilarities. Measurements should be taken when appropriate (all measurements are approximate).

4.11. Formulate a conclusion based on all the evidence examined.

4.12. The bases and reasons for the conclusion(s), opinion(s), or finding(s) should be included on the examiner's work notes and may be also included in the report.

5. Quality Assurance and Controls

5.1. The opinions given must be verified by another qualified forensic document examiner. The verification will be documented in the case record.

5.2. The case record will be technically reviewed by another qualified forensic document examiner.

5.3. The case record will be administratively reviewed by a supervisor or acting supervisor.

5.4. The examiner, technical reviewer, and administrative reviewer will complete a case record review form.

6. References

6.1. SWGDOC Standard Guide for Examination of Documents Produced with Toner Technology.

6.2. SWGDOC Standard for Examination of Documents Produced with Liquid Ink Jet Technology

6.3. Kelly, JS, Lindblom, Brian, Scientific Examination of Questioned Documents Second Edition, CRC Press, Boca Raton, FL, 2006

6.4. Hilton, Ordway, "Detecting Fraudulent Photocopies" Forensic Sciences International, Volume 13, 1979

6.5. Kelly, James H., Classification and Identification of Modern Office Copiers, The American Board of Forensic Document Examiners, Inc., Colorado Springs, Colorado, 1983

1. Scope

   1.1. To determine, if possible, if a particular entry has been altered.

   1.2. To decipher, if possible, an obliterated entry.

   1.3. To differentiate inks on a document.

2. Instruments

   2.1. Video Spectral Comparator (VSC)

   2.2. Stereoscopic microscope and/or hand magnifier

   2.3. Light sources to include transmitted light box

   2.4. Electrostatic Detection Apparatus (ESDA)

   2.5. Color filters

   2.6. Photocopier

   2.7. Scanner

3. Safety Considerations

   3.1. Take appropriate procedures when evidence is contaminated with body fluids or otherwise contaminated. Items should be handled in a manner that prevents examiner exposure and preserves DNA (if requested by the submitter).

   3.2. When handling a contaminated document, the examiner must wear a lab coat and examination gloves. The gloves must be placed in a properly labeled biohazard container after the examination is concluded.

4. Procedures

   4.1. The method for conducting a handwriting/hand printing examination will generally include the procedures detailed in ANSI/ASB 035, First Edition, 2020, Standard for Examination of Documents for Alterations. Any deviations from these procedures will be documented in the case record. The general steps to be accomplished are listed in the paragraphs below.

   4.2. It will be determined by the examiner on a case-by-case basis if the quality of photocopied and/or photographed evidence (both known and questioned) contains sufficient detail to support any of the opinions that may be rendered.

4.3. Mark the evidence or the proximal container with the exhibit number, case number, and initials.

4.4. Examine the document(s) macroscopically and microscopically.

4.5. Examine obliterated or altered area(s) using oblique light. In a darkened room, use microscope light to illuminate the document.

4.6. Examine obliterated or altered area(s) or inks using transmitted light.

4.7. Examine obliterated or altered area(s) or inks using the VSC. The VSC can be used in a number of different types of examinations. It is at the examiner's discretion as to which examinations to use; however, infrared luminescence and infrared reflectance are usually the most useful when examining altered/obliterated entries or for ink differentiation. Conduct a function test on the VSC prior to examining any casework. The test sheet is utilized to determine proper functioning of machine.

4.8. The ESDA may be useful in alteration/obliteration document cases. Sometimes an unaltered/unobliterated impression of the original entry can be found on documents associated with the altered/obliterated document. The ESDA should be operated in accordance with ATF-LS-QD6 Indented Writing Examination.

4.9. Conduct other examinations as deemed appropriate by the examiner.

4.10. Prepare work notes regarding the procedures used, any observations, and the bases for any opinions. Notes may be made directly on a copy of a document at the discretion of the examiner. Make written notes of similarities and/or dissimilarities. Make note of the settings on the VSC.

4.11. Formulate opinions based on all the evidence examined.

4.12. The bases and reasons for the conclusion(s), opinion(s), or finding(s) should be included in the examiner's work notes and may be also included in the report.

5. Quality Assurance and Controls

5.1. Tests of the VSC and ESDA will be completed on the day of the examination. The results of the test will be documented in the examiner's notes.

5.2. The opinions given must be verified by another qualified forensic document examiner. The verification will be documented in the case record.

5.3. The case record will be technically reviewed by another qualified forensic document examiner.

5.4. The case record will be administratively reviewed by a supervisor or acting supervisor.

5.5. The examiner, technical reviewer, and administrative reviewer will complete a case record review form.

6. References

6.1. ANSI/ASB Standard 035, First Addition, 2020, Standard for the Examination of Documents for Alterations.

6.2. SWGDOC Standard Guide for Test Methods for Forensic Writing Ink Comparison.

6.3. ATF-LS-QD6 Indented Writing Examination.

6.4. Conway, James V. P., Evidential Documents, Charles C. Thomas Publisher, Springfield, Illinois, 1959.

6.5. Harrison, Wilson R., Suspect Documents Their Scientific Examination, Sweet & Maxwell, Ltd, London, England, 1966.

6.6. Hilton, Ordway, Scientific Examination of Questioned Documents, Elsevier Science Publishing Co., Inc., New York, New York, 1982.

6.7. Kelly, JS, Lindblom, Brian, Scientific Examination of Questioned Documents Second Edition, CRC Press, Boca Raton, FL, 2006.

1. Scope

   1.1. To detect and decipher, if possible, written indentations on paper.

2. Instrumentation

   2.1. Electrostatic Detection Apparatus (ESDA-2)

   2.2. A light source(s) suitable for oblique lighting (side lighting)

   2.3. A photocopier and/or a flatbed scanner or camera

3. Safety Considerations

   3.1. Do not touch the internal corona wire on the corona wand as an electrical shock may occur.

   3.2. Additional safety information can be found in the ESDA-2 User Manual.

   3.3. Take appropriate procedures when evidence is contaminated with body fluids or otherwise contaminated. Items should be handled in a manner that prevents examiner exposure and preserves DNA (if requested by the submitter).

   3.4. When handling a contaminated document, the examiner must wear a lab coat and examination gloves. The gloves must be placed in a properly labeled biohazard container after the examination is concluded.

4. Procedure

   4.1. Special Handling

      4.1.1. Wear examination gloves when handling specimens. The ESDA-2 can develop latent prints on the paper. The developed prints may interfere with the decipherment of developed indentations. Do not wear cloth gloves.

      4.1.2. Do not write on the evidence container and/or envelope if the writing is likely to cause indentations on the evidence.

      4.1.3. If the specimen will be swabbed for DNA, or if the specimen is contaminated, use a barrier sheet on the ESDA-2 platen. A sheet of 11-inch by 17-inch copier paper works well for many specimen documents.

   4.2. Supplies

      4.2.1. Sheets of fixing film (laminate)

      4.2.2. Roll of imaging film

4.2.3. Cascade developer (beads coated with toner)

4.2.4. Toner (to recharge the cascade developer as needed)

4.2.5. A cutting device, a fine point marking pen, paper, and examination gloves

4.3. Function Test

4.3.1. Use two sheets of paper to create "test sheets." Process the second page of the test sheets on the ESDA-2 to determine whether the device is functioning properly. Create a lift and document the results. The test sheets will be maintained in the ESDA-@maintenance log.

4.3.2. Additional test sheets may be made at the examiner's discretion. Under normal circumstances one test sheet is sufficient for a day.

4.3.3. If the developed image is faint, the cascade developer may need more toner or the humidity may be too low. If no image is developed, the machine may not be working properly.

4.3.4. If the test results, or other visual/audio clues, indicate a problem with the machine (e.g., blown fuse), discontinue the process until the issues are corrected.

4.3.5. Control strips (a strip of paper bearing indentations that is placed alongside a specimen during processing) are not required but may be used at the examiner's discretion.

4.3.6. Images of the test sheets and the test and lift(s) are to be placed in the case record.

4.4. Procedure

4.4.1. The proximal container of the specimen is marked in ink with the appropriate exhibit number, case number, the examiner's initials, and other marking at the examiner's discretion. Marking the specimen is at the discretion of the examiner but should not be done when the specimen will be processed for latent prints or swabbed for DNA.

4.4.2. Examine the specimen using oblique lighting to disclose the presence of visible indentations. Various light sources may be used to include those in the Video Spectral Comparator (VSC6000). Any indentations observed may be documented using digital camera images or using the imaging function of the VSC6000.

4.4.3. Process the specimen using an ESDA-2. The ESDA-2 should normally be operated in accordance with the user manual. Any deviation from those instructions should be documented in the case record. Consider the results of available research when operating the ESDA-2.

4.4.4. Based on the results of the test sheet, the relative humidity in the laboratory, and the discretion of the examiner, the specimen may be placed in the humidity chamber for a few minutes prior to processing.

4.4.4.1. Placing the document in the humidity chamber may be needed if the ambient relative humidity is less that 60 percent.

4.4.4.2. The humidity in the chamber should be above 60 percent (the humidity in the chamber normally exceeds 80%).

4.4.4.3. The ANSI/ASB Standard 044, First Edition, 2019, Standard for Examination of Documents for Indentations does not suggest a particular humidity time. The ESDA-2 User Manual states that the document should be left in the chamber for 1-2 minutes. Some research has indicated that a longer humidity time could be beneficial. The humidity time is at the discretion of the examiner.

4.4.5. Clear the ESDA-2 platen of beads from the cascade toner.

4.4.6. Place the specimen on the ESDA-2 platen.

4.4.7. Turn on the ESDA-2 vacuum pump (red button).

4.4.8. Pull imaging film over the specimen and cut the imaging film to size needed to fully cover the platen.

4.4.9. Turn on the corona wand (blue button) and pass it over the specimen several times. The wand will automatically turn off after a few seconds and the wand button will flash. Wait for the button to quit flashing perform proceeding.

4.4.10. Applying toner. Three methods of applying toner to the surface of the imaging film may be used. The cascade method is normally used; however, the other two methods are available and can be used at the discretion of the examiner.

4.4.10.1. Cascade Method - Tilt the platen up to approximately 30 degrees and allow the cascade developer to cascade down over the entire specimen (this process can be repeated as needed to develop indentations).

4.4.10.2. Aerosol Development Method – Plug the Aerosol Development Hood into the ESDA-2. Make sure there is sufficient toner in the toner chamber. Place the hood over the specimen. Turn the hood on. Spray toner over the surface of the specimen by using the lever on the toner chamber. Repeated as needed.

4.4.10.3. Toner Application Device (TAD) Method – The toner is manually applied by wiping the surface of the imaging film with the TAD.

4.4.11. Carefully remove stray beads on the surface of the specimen (cascade method only). Place fixing film on top of imaging film to create a "lift" of the developed impressions. "Negative lifts" (lifts with no developed indentations) are normally prepared as well. At the discretion of the examiner, digital camera images may be substituted for lifts.

4.4.12. Remove the lift from the original specimen.

4.4.13. Place the lift on the backing paper of the fixing film.

4.4.14. Analysis

4.4.14.1. Examine the lift for the presence of developed indentations.

4.4.14.2. If suspected originating documents are submitted for examination, compare the originating documents with the developed indentations.

4.4.14.3. Consider the possibility of secondary impressions.

4.4.14.4. Formulate an opinion based on all the evidence examined.

4.4.15. Prepare additional lifts as needed. Process both the front and back of the specimen unless circumstances indicate it to be unnecessary.

4.5. Documentation

4.5.1. Photocopy or scan each specimen for the technical records. A camera may also be used to make digital images.

4.5.2. Photocopy or scan the lift(s). A camera may also be used to make digital images.

4.5.3. The photocopies, scanned images, and camera images will be placed in the case record with other notes.

4.5.4. The original lift(s) is a lab-generated item and will be sent to the submitter along with the submitted evidence.

4.5.5. Prepare notes regarding the testing of the ESDA-2, observations, and bases for any opinions. Notes may be made directly on a copy of a lift at the discretion of the examiner.

4.5.6. Prepare a laboratory report. ESDA-2 lifts are sub-exhibits, but are not listed in the exhibit section of the report. They will be listed in the narrative of the report. The lifts will be sent to the submitter along with the submitted evidence.

5. Quality Assurance & Controls

5.1. A test of the ESDA-2 will be completed on the day of the examination. The results of the test will be documented in the examiner's notes.

5.2. The opinions given must be verified by another qualified forensic document examiner. The verification will be documented in the case record.

5.3. The case record will be technically reviewed by another qualified forensic document examiner.

5.4. The case record will be administratively reviewed by a supervisor or acting supervisor.

5.5. The examiner, technical reviewer, and administrative reviewer will complete a case record review form.

6. References

6.1. ESDA-2 Electrostatic Detection Apparatus User Manual, Version Number 000-001-12, Foster & Freeman USA Inc., Sterling, Virginia.

6.2. ANSI/ASB Standard 044, First Edition, 2019, Standard for Examination of Documents for Indentations.

1. Scope

   1.1. To determine, if possible, any decipherable information on the charred material.

2. Instruments/Reagents

   2.1. Stereobinocular microscope and/or hand magnifier

   2.2. Light sources

   2.3. Photocopier

   2.4. Scanner

   2.5. Video Spectral Comparator (VSC)

   2.6. Various tools such as a mister, trays, bone folders, picks, probes, and tweezers

   2.7. Water, glycerin, alcohol, and other chemicals (if deemed appropriate).

3. Safety Considerations

   3.1. Take appropriate procedures when evidence is contaminated with body fluids or otherwise contaminated. Items should be handled in a manner that prevents examiner exposure and preserves DNA (if requested by the submitter).

   3.2. When handling a contaminated document, the examiner must wear a lab coat and examination gloves. The gloves must be placed in a properly labeled biohazard container after the examination is concluded.

4. Procedures

   4.1. The method for conducting a charred document examination will generally include the procedures detailed in ANSI/ASB Standard 127, First Edition, 2022, Standard for the Preservation and Examination of Charred Documents. Any deviations from these procedures will be documented in the case record. Some types of examinations mentioned in the standard, such as parylene processing, are not available in this laboratory. The general steps to be accomplished are listed in the paragraphs below.

   4.2. Charred documents are fragile and should be handled as little as possible. They should be stored in a manner that prevents, in as much as possible, further deterioration. The proximal container should be marked with the exhibit number, case number, and the examiner's initials.

   4.3. Charred documents should initially be imaged as they were received.

   4.4. Consider the use of a chemical treatment of the document(s). These techniques are potentially destructive to the overall document or the text on the document. One

treatment uses a solution of 20% water, 50% alcohol, 30% glycerin (see Doud in references below).

4.5. Examine the documents macroscopically and microscopically (if necessary) in an effort decipher the text. Image the documents as deemed appropriate to record the findings.

4.6. If necessary, examine the charred documents using the various techniques available using the VSC. It is in the examiner's discretion to determine which techniques are appropriate. A function test should be conducted prior to the examination with the results recorded in the case notes.

4.7. Consider polyester encapsulation as a means of preserving the document(s).

4.8. Make written notes of findings. Image documents as deemed appropriate. The bases and reasons for the conclusion(s), opinion(s), or finding(s) should be included in the examiner's work notes and be included in the final report.

4.9. Formulate an opinion(s) based on all the evidence examined and prepare a laboratory report.

5. Quality Assurance and Controls

5.1. A test of the VSC will be completed on the day of the examination. The results of the test will be documented in the examiner's notes.

5.2. The opinions given must be verified by another qualified forensic document examiner. The verification will be documented in the case record.

5.3. The case record will be technically reviewed by another qualified forensic document examiner.

5.4. The case record will be administratively reviewed by a supervisor or acting supervisor.

5.5. The examiner, technical reviewer, and administrative reviewer will complete a case record review form.

6. References

6.1. ANSI/ASB Standard 127, First Edition, 2022, Standard for the Preservation and Examination of Charred Documents.

6.2. Doud, Donald, Charred Documents, Their Handling and Decipherment: A Summary of Available Methods for Treating Burnt Papers, Journal of Criminal Law and Criminology, Volume 43, Issue 6, 1953.

6.3. Brunelle, Richard L. and Reed, Robert W., Forensic Examination of Ink and Paper, Charles C. Thomas Publisher, Springfield, Illinois, 1984.

6.4. Conway, James V. P., Evidential Documents, Charles C. Thomas Publisher, Springfield, Illinois, 1959.

6.5. Hilton, Ordway, Scientific Examination of Questioned Documents, Elsevier Science Publishing Co., Inc., New York, New York 1982.

6.6. Osborn, Albert S., Questioned Documents, Nelson-Hall, Inc., Chicago, Illinois, 1929.

1. Scope

   1.1. To determine, if possible, the printing method used to print a computer-printed document.

   1.2. To determine, if possible, whether particular printer was used to make the questioned document.

2. Instruments/Reagents

   2.1. Stereobinocular microscope and/or hand magnifier

   2.2. Light sources

   2.3. Photocopier

   2.4. Scanner

   2.5. Video Spectral Comparator (VSC)

3. Safety Considerations

   3.1. Take appropriate procedures when evidence is contaminated with body fluids or otherwise contaminated. Items should be handled in a manner that prevents examiner exposure and preserves DNA (if requested by the submitter).

   3.2. When handling a contaminated document, the examiner must wear a lab coat and examination gloves. The gloves must be placed in a properly labeled biohazard container after the examination is concluded.

4. Procedures

   4.1. If a printer, or a set of exemplars from a known printer, is submitted for examination, determine the printing method used by the printer.

   4.2. If it is determined that the printing method is toner based, the method for conducting an examination of a computer-printed document will generally include the procedures detailed in Scientific Working Group for Document Examination (SWGDOC) Standard Guide for Examination of Documents Produced with Toner Technology.

   4.3. If it is determined that the printing method is inkjet based, the method for conducting an examination of a computer-printed document will generally include the procedures detailed in SWGDOC Standard for Examination of Documents Produced with Liquid Ink Jet Technology.

   4.4. If it is determined that the printing method involves a transfer ribbon, the method for conducting an examination of a computer-printed document will generally include the

relevant procedures detailed in SWGDOC Standard for Examination of Fracture Patterns and Paper Fiber Impressions on Single-Strike Film Ribbons and Typed Text.

4.5. If it is determined that the printing method involves an impact printing (e.g., printwheel), the method for conducting an examination of a computer-printed document will generally include the relevant procedures detailed in SWGDOC Standard for Examination of Typewritten Items.

4.6. Any deviations from these published standards listed above should be documented in the case record. The general steps to be accomplished are listed in the paragraphs below.

4.7. If the printer uses a technology not covered by these standards (e.g., dye sublimation printing, solid ink printing, Risograph), apply the principles in these standards inasmuch as possible.

4.8. Mark the evidence or the proximal container of evidence with the exhibit number, case number, and initials. Any exemplars taken from any suspect printers submitted should also be marked with the serial number and model of the printer.

4.9. Conduct a macroscopic and microscopic examination to determine or verify the printing method of the questioned document and any submitted exemplars.

4.10. Determine the class characteristics of the questioned document and any exemplars.

4.11. Examine the questioned document and exemplars for any individual characteristics. The type of possible individual characteristics will vary based on the printing method.

4.12. Compare the questioned document with the exemplars assessing the similarities as well as dissimilarities.

4.13. Examination of the documents using various techniques available in the VSC may help in identifying similarities and dissimilarities.

4.14. Identification of the typestyle or font used may also provide useful information (e.g. document dating).

4.15. Document the procedures performed and findings in the examiner work notes, which should include images of the questioned and known documents.

4.16. Formulate an opinion based on any findings.

4.17. The bases and reasons for the conclusion(s), opinion(s), or finding(s) should be included in the examiner’s work notes and may be also included in the report.

5. Quality Assurance and Controls

5.1. A test of the VSC will be completed on the day of the examination. The results of the test will be documented in the examiner's notes.

5.2. The opinions given must be verified by another qualified forensic document examiner. The verification will be documented in the case record.

5.3. The case record will be technically reviewed by another qualified forensic document examiner.

5.4. The case record will be administratively reviewed by a supervisor or acting supervisor.

5.5. The examiner, technical reviewer, and administrative reviewer will complete a case record review form.

6. References

6.1. SWGDOC Standard Guide for Examination of Documents Produced with Toner Technology.

6.2. SWGDOC Standard for Examination of Documents Produced with Liquid Ink Jet Technology.

6.3. SWGDOC Standard for Examination of Fracture Patterns and Paper Fiber Impressions on Single-Strike Film Ribbons and Typed Text.

6.4. SWGDOC Standard for Examination of Typewritten Items.

1. Scope

   1.1. To determine, if possible, if two or more paper fragments were, at some time, joined or were perforated while one was on top of the other.

2. Instruments

   2.1. Stereoscopic microscope and/or hand magnifier

   2.2. Light sources

   2.3. Photocopier

   2.4. Scanner

   2.5. Video Spectral Comparator (VSC)

3. Safety Considerations

   3.1. Take appropriate procedures when evidence is contaminated with body fluids or otherwise contaminated. Items should be handled in a manner that prevents examiner exposure and preserves DNA (if requested by the submitter).

   3.2. When handling a contaminated document, the examiner must wear a lab coat and examination gloves. The gloves must be placed in a properly labeled biohazard container after the examination is concluded.

4. PROCEDURES:

   4.1. The method for conducting examinations of paper cuts, tears, and perforations to determine if there is a physical fit will generally include the procedures detailed in SWGDOC Standard for Physical Match of Paper Cuts, Tears, and Perforations in Forensic Document Examinations. Any deviations from these procedures will be documented in the case record. The general steps to be accomplished are listed in the paragraphs below.

   4.2. Mark the evidence or the proximal container with the exhibit number, case number, and initials.

   4.3. Determine whether the specimens are broken or separated.

   4.4. Determine whether the specimens are suitable to be physically realigned.

   4.5. Evaluate the specimens for individualizing characteristics.

   4.6. Conduct a side-by-side comparison of the specimens using the following steps:

   4.7. Visual inspection

Microscopic examination may assist in determining the front or back of a paper fragment and also determining the grain direction on the paper.

4.8. Manual alignment

4.8.1. The techniques available using the VSC may assist in sorting similar and dissimilar fragments of paper. It may also assist in finding inclusions in the paper and luminescent fibers.

4.9. Edge-to-edge alignment

4.9.1. Microscopic examination of paper fibers and inclusions along the edge of the paper may assist in realignment.

4.10. Surface markings (e.g., handwriting, printer text, and commercial printing).

4.11. Measurements and pattern count (if relevant to the examination).

4.12. Evaluate similarities, differences, and limitations. Determine their significance individually and in combination.

4.13. Make written notes of procedures used and findings. Image documents as deemed appropriate. The bases and reasons for the conclusion(s), opinion(s), or finding(s) should be included in the examiner's work notes and may also be included in the final report.

4.14. Formulate an opinion(s) based on all the evidence examined and prepare a laboratory report.

5. Quality Assurance and Controls

5.1. A test of the VSC will be completed on the day of the examination. The results of the test will be documented in the examiner's notes.

5.2. The opinions given must be verified by another qualified forensic document examiner. The verification will be documented in the case record.

5.3. The case record will be technically reviewed by another qualified forensic document examiner.

5.4. The case record will be administratively reviewed by a supervisor or acting supervisor.

5.5. The examiner, technical reviewer, and administrative reviewer will complete a case record review form.

6. References

6.1. SWGDOC Standard for Physical Match of Paper Cuts, Tears, and Perforations in Forensic Document Examinations.

1. Scope

   1.1. To determine, if possible, if two or more rubber stamp impressions resulted from the same stamp.

   1.2. To determine, if possible, if a known stamp produced a questioned impression(s).

2. Instruments

   2.1. Stereoscopic microscope and/or hand magnifier

   2.2. Light sources

   2.3. Photocopier

   2.4. Scanner

3. Safety Considerations

   3.1. Take appropriate procedures when evidence is contaminated with body fluids or otherwise contaminated. Items should be handled in a manner that prevents examiner exposure and preserves DNA (if requested by the submitter).

   3.2. When handling a contaminated document, the examiner must wear a lab coat and examination gloves. The gloves must be placed in a properly labeled biohazard container after the examination is concluded.

4. Procedures

   4.1. The method for conducting a rubber stamp examination will generally include the procedures detailed in ANSI/ASB Standard 117, First Edition 2020 Standard for Examination of Stamping Devices and Stamp Impressions. Any deviations from these procedures will be documented in the case record. The general steps to be accomplished are listed in the paragraphs below.

   4.2. Mark the evidence or the proximal container with the exhibit number, case number, and initials.

   4.3. Determine whether the submitted questioned impression(s) were produced by a rubber stamp. If not a rubber stamp impression (original or copy), discontinue examination and report accordingly.

   4.4. Determine whether the examination is a comparison of questioned impressions; a comparison of questioned impression(s) with a known impression(s); or a comparison of a questioned impression(s) with a rubber stamp(s).

4.5. Determine whether the submitted questioned impression(s) is suitable for comparison. If it is not suitable for comparison, discontinue the procedure and report accordingly. Factors that affect the suitability include clarity, detail, degree of inking or condition of the document.

4.6. If no known specimen impressions or rubber stamp(s) submitted, go to step 4.14.

4.7. If a rubber stamp(s) is submitted, its condition should be noted (e.g., clean, dirty, inked, worn, damaged).

4.8. Note, when applicable, class characteristics (e.g., typeface design and size).

4.9. Note any visible features that reproduce on the impression.

4.10. Prepare appropriate specimens, as needed.

4.11. Determine if any of the known specimen impressions are suitable for comparison.

4.12. If none of the known specimen impressions are suitable for comparison and no others are obtained, discontinue these procedures and report accordingly.

4.13. Conduct a side-by-side comparison of the questioned impressions, or the questioned impression to the known impressions and/or to the rubber stamp(s).

4.14. Compare class characteristics (e.g., size, type style, text, shape). If different, discontinue and report accordingly.

4.15. Compare individualizing characteristics in common such as wear and damage defects, reproducible blemishes, impression voids, improper and extraneous inking, or coincidental peripheral printing (use transparency overlays when needed).

4.16. Evaluate similarities, differences, and limitations. Determine their significance individually and in combination. Consideration should be given to the possibility that a rubber stamp can be manufactured which duplicates the impressions of another stamp, and that various forms of simulations, imitations, and duplicates of rubber stamps or rubber stamp impressions can be generated by computer and other means.

4.17. Make work notes and copies of submitted documents including a representative sample of the significant characteristics of the evidence documenting similarities and dissimilarities of each item.

4.18. Formulate a conclusion based on all the evidence examined.

4.19. Prepare laboratory report.

4.20. The bases and reasons for the conclusion(s), opinion(s), or finding(s) should be included in the examiner's work notes and may be also included in the report.

5. Quality Assurance and Controls

5.1. The opinions given must be verified by another qualified forensic document examiner. The verification will be documented in the case record.

5.2. The case record will be technically reviewed by another qualified forensic document examiner.

5.3. The case record will be administratively reviewed by a supervisor or acting supervisor.

5.4. The examiner, technical reviewer, and administrative reviewer will complete a case record review form.

6. References

6.1. ANSI/ASB Standard 117, First Edition 2020 Standard for Examination of Stamping Devices and Stamp Impressions.

6.2. Herbertson, Gary, Rubber Stamp Examination: A Guide for Forensic Document Examiners, WideLine Publishing, Colorado Springs, CO, 1997.

6.3. Kelly, Jan S., Forensic Examination of Rubber Stamps: A Practical Guide, Charles C. Thomas Publisher, Springfield, IL, 2002.

1. Scope

   1.1. To define terminology for expressing questioned document conclusions in handwriting examinations.

   1.2. Section 6.8.3 of ANSI/ASB 070, First Edition, 2022, Standard for Examination of Handwritten Items does not describe opinion terminology. Instead, it states, "For generally accepted phrases expressing conclusions, refer to professional Forensic Document Examination organizations and published standards." This laboratory is required to use the terminology described in United States Department of Justice Uniform Language for Testimony and Reports for Forensic Document Examination (hereinafter referred to as the ULTR).

   1.3. The language used for handwriting comparison opinions may be adapted to non-handwriting examinations.

   1.4. Section IV of the ULTR is applicable to all forensic document examinations unless otherwise limited by the express terms of an individual qualification or limitation.

2. Instrumentation/Reagents

   2.1. Not applicable.

3. Safety Considerations

   3.1. Not applicable.

4. Procedures

   4.1. Terminology for expressing opinions in handwriting comparison examinations is defined as follows. An examiner may offer any of the following opinions:

      4.1.1. Source identification (i.e., identified)

      4.1.2. Support for common source (The degree of 'support for common source' may range from limited to strong.)

         4.1.2.1. Strong support for common source

         4.1.2.2. Limited support for common source

      4.1.3. Inconclusive

      4.1.4. Support for different sources (The degree of 'support for different sources' may range from limited to strong.)

         4.1.4.1. Limited support for different sources

4.1.4.2. Strong support for different sources

4.1.5. Source exclusion (i.e., excluded)

4.2. These are opinions are further defined as follows:

4.2.1. 'Source identification' is an examiner's conclusion that two or more bodies of writing were prepared by the same writer. This conclusion is an examiner's opinion that 1) the observed quality and quantity of similar characteristics are such that the examiner would not expect to see that same combination of characteristics repeated in a body of writing prepared by another writer; 2) there are no significant dissimilarities to conclude that the bodies of writing were not prepared by the same writer; and 3) there are no significant limitations with the items examined or the circumstances considered (e.g. the writer's skill level, sufficient number of known standards). The basis for a 'source identification' conclusion is an examiner's opinion that the observed similar characteristics provide extremely strong support for the proposition that the bodies of writing were prepared by the same writer and extremely limited or no support for the proposition that the writings were prepared by different writers. A 'source identification' is the statement of an examiner's opinion (an inductive inference) that the probability that a different writer prepared the questioned body of writing is so small that it is negligible.

4.2.2. 'Support for common source' is an examiner's conclusion that two or more bodies of writing may have been prepared by the same writer. This conclusion is an examiner's opinion that 1) the bodies of writing exhibit a prevalence of similar characteristics to indicate they may have been prepared by the same writer; 2) there are insufficient dissimilar characteristics to indicate that the bodies of writing may not have been prepared by the same writer; and 3) the bodies of writing have limitations that prevent the examiner from providing a 'source identification' conclusion. The degree of 'support for common source' may range from limited to strong. The basis for a 'support for common source' conclusion is an examiner's opinion that the observed similar characteristics provide limited to strong support for the proposition that the bodies of writing may have been prepared by the same writer and insufficient support for the proposition that the writings may have been prepared by different writers.

4.2.3. 'Inconclusive' is an examiner's opinion that no determination can be reached as to whether two or more bodies of writing were prepared by the same writer or by different writers. The basis for an 'inconclusive' conclusion is an examiner's opinion that the bodies of writing have limitations that prevent the examiner from providing any conclusion regarding probable authorship.

4.2.4. 'Support for different sources' is an examiner's conclusion that two or more bodies of writing may not have been prepared by the same writer. This conclusion

is an examiner's opinion that 1) the bodies of writing exhibit a prevalence of dissimilar characteristics to indicate they may not have been prepared by the same writer; 2) there are insufficient similar characteristics to indicate that the bodies of writing may have been prepared by the same writer; and 3) the bodies of writing have limitations that prevent the examiner from making an 'exclusion' conclusion. The degree of 'support for different sources' may range from limited to strong. The basis for a 'support for different sources' conclusion is an examiner's opinion that the observed dissimilar characteristics provide limited to strong support for the proposition that the bodies of writing may have been prepared by different writers and insufficient support for the proposition that the writings may have been prepared by the same writer.

4.2.5. 'Source exclusion' is an examiner's conclusion that two or more bodies of writing were not prepared by the same writer. This conclusion is an examiner's opinion that the bodies of writing exhibit different handwriting characteristics and there are no significant limitations with the items examined or the circumstances considered (e.g. the writer's skill level, sufficient number of known standards, eliminating the possibility of alternative writing styles).The basis for a 'source exclusion' conclusion is an examiner's opinion that the observed different characteristics provide extremely strong support for the proposition that the bodies of writing were prepared by the different writers and extremely limited or no support for the proposition that the writings were prepared by the same writer.

5. Quality Assurance and Controls

5.1. The opinions given must be verified by another qualified forensic document examiner. The verification will be documented in the case record.

5.2. Additional restrictions on opinions are listed in Section IV of the ULTR.

5.3. The case record will be technically reviewed by another qualified forensic document examiner.

5.4. The case record will be administratively reviewed by a supervisor or acting supervisor, unless the laboratory chief has designated another person to do so.

5.5. The examiner, technical reviewer, and admin reviewer will complete a case record review form.

6. References

6.1. ANSI/ASB 070, First Edition, 2022, Standard for Examination of Handwritten Items.

6.2. United States Department of Justice Uniform Language for Testimony and Reports for Forensic Document Examination (effective 7/5/21).

1. Scope

   1.1. To conduct non-destructive examinations of paper.

2. Instruments

   2.1. Stereoscopic microscope and/or hand magnifier

   2.2. Light sources

   2.3. Photocopier

   2.4. Scanner

   2.5. Video Spectral Comparator (VSC)

   2.6. Ultraviolet (UV) Light Wand

3. Safety Considerations

   3.1. Take appropriate procedures when evidence is contaminated with body fluids or otherwise contaminated. Items should be handled in a manner that prevents examiner exposure and preserves DNA (if requested by the submitter).

   3.2. When handling a contaminated document, the examiner must wear a lab coat and examination gloves. The gloves must be placed in a properly labeled biohazard container after the examination is concluded.

4. Procedures

   4.1. The method for conducting a non-destructive examination of paper will generally include the procedures detailed in the SWGDOC Standard for Non-destructive Examination of Paper. Any deviations from these procedures will be documented in the case record. The general steps to be accomplished are listed in the paragraphs below.

   4.2. Mark the evidence or the proximal container with the exhibit number, case number, and initials.

   4.3. Make a visual examination of the paper (both with and without the microscope) for the following features:

      4.3.1. Color, brightness and opacity

      4.3.2. Texture or pattern on the paper

         4.3.2.1. Smoothness

         4.3.2.2. Felt and wire sides

4.3.3. Watermarks

4.3.4. Weight and basis weight

4.3.5. Size and shape of the paper

4.3.6. How the edges were cut

4.3.7. Fiber direction

4.4. Use the VSC examine the paper for the presence of the following:

4.4.1. Infrared luminescence of fluorescence of fibers

4.4.2. Fluorescence of filler, starch, etc. materials

4.4.3. Wetting patterns

4.4.4. UV fluorescence (the UV light wand can also be used)

4.5. Compare questioned document(s) to any known samples (if submitted) and document any similarities and/or dissimilarities.

4.6. Formulate a conclusion based on all the evidence examined.

4.7. Document procedures and findings in the examiner work notes. The work notes should also include copies of the submitted evidence with a representative sample of the significant characteristics of the evidence along with the observations of the examiner. Any measurements taken, which always will be approximate, should also be included.

4.8. Prepare a laboratory report.

4.9. The bases and reasons for the conclusion(s), opinion(s), or finding(s) should be included in the examiner's work notes and may be also included in the report.

5. Quality Assurance and Controls

5.1. A test of the VSC will be completed on the day of the examination. The results of the test will be documented in the examiner's notes.

5.2. The opinions given must be verified by another qualified forensic document examiner. The verification will be documented in the case record.

5.3. The case record will be technically reviewed by another qualified forensic document examiner.

5.4. The case record will be administratively reviewed by a supervisor or acting supervisor.

5.5. The examiner, technical reviewer, and administrative reviewer will complete a case record review form.

6. References

6.1. SWGDOC Standard for Non-destructive Examination of Paper.

1. Scope

   1.1. To determine, if possible, if a device made an impression(s).

   1.2. To determine, if possible, whether two or more impressions were the result of a common device.

   1.3. These devices can include checkwriter machines, dry seals, and stamps that leave an impression with depth.

2. Instruments

   2.1. Stereobinocular microscope and/or hand magnifier

   2.2. Light sources

   2.3. Photocopier

   2.4. Scanner

   2.5. Video Spectral Comparator (VSC)

   2.6. Ultraviolet (UV) Light Wand

3. Safety Considerations

   3.1. Take appropriate procedures when evidence is contaminated with body fluids or otherwise contaminated. Items should be handled in a manner that prevents examiner exposure and preserves DNA (if requested by the submitter).

   3.2. When handling a contaminated document, the examiner must wear a lab coat and examination gloves. The gloves must be placed in a properly labeled biohazard container after the examination is concluded.

4. Procedures

   4.1. If the questioned document was produced by a checkwriter, the method for conducting the examination will generally include the procedures detailed in ANSI/ASB Standard 172 First Edition 2024 Standard for Examination of Mechanical Checkwriter Impressions and Machines. Any deviations from these procedures will be documented in the case record. The general steps to be accomplished are listed in the paragraphs below.

   4.2. Mark the evidence or the proximal container with the exhibit number, case number, and initials. Examine the questioned and known impressions for the following characteristics:

   4.3. Presence of ink(s)

4.3.1. What colors are present?

4.3.2. Are the questioned and known inks similar in color and reactivity?

4.3.3. Does the ink come from an inked roller or ribbon?

4.3.4. Is there any unusual blending or bleeding of the ink?

4.3.5. Is the ink being deposited in its normal location?

4.4. Does the checkwriter shred, tear or perforate the document?

4.5. What are the shapes of the letters/numbers and what sort of pattern is used to produce them?

4.6. Is a removable prefix, etc. present?

4.7. After the examination, determine whether the suspected checkwriter qualifies as a source of the impressions on the questioned documents. If it does, then evaluate the characteristics seen and determine whether they are indicative of class characteristics or individual characteristics.

4.8. Individual characteristics may include patterns of unevenness of perforation and shredding patterns or inking errors. Broken or damaged letters/numbers may leave identifiable defects in the checkwriter impressions.

4.9. Incorporate the information into a questioned document examination or issue a report.

4.10. If the questioned document bears a dry seal, the method for conducting the examination will generally include the procedures detailed in SWGDOC Standard for Examination of Dry Seal Impressions. Any deviations from these procedures will be documented in the case record. The general steps to be accomplished are listed in the paragraphs below.

4.11. Mark the evidence or the proximal container with the exhibit number, case number, and initials.

4.12. Examine the dry seal impression(s) for the following characteristics:

4.12.1. Depth and quality of the impression

4.12.2. Any "defects" or wear patterns

4.13. Check possible "defects" against the original seal, if available, to make sure they are individual and not class characteristics.

4.13.1. Characteristics of the dry seal

4.13.2. Check the "fit" of the two parts of the dry seal

4.14. After the examination, check to see if the suspect seal could have produced the questioned seal. If so, determine whether the pattern of characteristics present is class characteristic or an individual pattern.

4.15. Arrive at a conclusion based on the examination.

4.16. Report the results of these procedures as appropriate.

4.17. If the suspected dry seal has not been found or submitted, see if there is any investigative information present.

4.18. If none of the known specimen impressions are suitable for comparison and no others are obtained, discontinue these procedures and report accordingly.

4.19. Conduct a side-by-side comparison of the questioned impressions, or the questioned impression to the known impressions.

4.20. Compare class characteristics (e.g., size, type style, text, shape). If different, discontinue and report accordingly.

4.21. Compare individualizing characteristics in common such as wear and damage defects, reproducible blemishes, impression voids, improper and extraneous inking, or coincidental peripheral printing (use transparency overlays when needed).

4.22. Evaluate similarities, differences, and limitations. Determine their significance individually and in combination. Consideration should be given to the possibility that a rubber stamp can be manufactured which duplicates the impressions of another stamp, and that various forms of simulations, imitations, and duplicates of rubber stamps or rubber stamp impressions can be generated by computer and other means.

4.23. Make written notes of the procedures used, pertinent observations, and any similarities and/or dissimilarities. Measurements should be taken when appropriate (all measurements are approximate).

4.24. Formulate a conclusion based on all the evidence examined.

4.25. The bases and reasons for the conclusion(s), opinion(s), or finding(s) should be included in the examiner’s work notes and may be also included in the report.

5. Quality Assurance and Controls

5.1. A test of the VSC will be completed on the day of the examination. The results of the test will be documented in the examiner’s notes.

5.2. The opinions given must be verified by another qualified forensic document examiner. The verification will be documented in the case record.

5.3. The case record will be technically reviewed by another qualified forensic document examiner.

5.4. The case record will be administratively reviewed by a supervisor or acting supervisor.

5.5. The examiner, technical reviewer, and administrative reviewer will complete a case record review form.

6. References

6.1. ANSI/ASB Standard 172 First Edition 2024 Standard for Examination of Mechanical Checkwriter Impressions and Machines.

6.2. SWGDOC Standard for Examination of Dry Seal Impressions.

6.3. Vastrick, Thomas, Classification and Identification of Checkwriters, American Board of Forensic Document Examiners, Inc. 1991.

1. Scope:

   1.1. To determine, if possible, the sequence of the application of a line of writing that intersects another line of writing, typewriting, toner, crease, or other media.

2. Instruments

   2.1. Stereoscopic microscope (equipped with ring light)

   2.2. Hand magnifier

   2.3. Light sources

   2.4. Photocopier

   2.5. Scanner

   2.6. Video Spectral Comparator (VSC)

   2.7. Electrostatic Detection Apparatus (ESDA)

3. Safety Considerations

   3.1. Take appropriate procedures when evidence is contaminated with body fluids or otherwise contaminated. Items should be handled in a manner that prevents examiner exposure and preserves DNA (if requested by the submitter).

   3.2. When handling a contaminated document, the examiner must wear a lab coat and examination gloves. The gloves must be placed in a properly labeled biohazard container after the examination is concluded.

4. Procedures

   4.1. The method for conducting a handwriting/hand printing examination will generally include the procedures detailed in ANSI/ASB 070, First Edition, 2022, Standard for Examination of Handwritten Items. Any deviations from these procedures will be documented in the case record. The general steps to be accomplished are listed in the paragraphs below.

   4.2. Mark the evidence or the proximal container with the exhibit number, case number, and initials.

   4.3. If possible, determine the direction of the writing stroke(s). If the examination of the writing involves a ball point type of writing instrument, observe the striations which may be present. The striations will run from the inside of the curve toward the outside edge of the curve in the direction the pen was moving. Observe possible "gooping" of ink after a change in direction of the pen. Determine which side of the paper fibers the ink

(or pencil lead) deposits appear to pile up against (on the side opposite the direction of travel).

4.4. Examine the line intersection using the microscope or VSC. Check for differences in inks used and check to see if material from the first writing is dispersed or redistributed along the later line.

4.5. Examine the paper surface to determine if paper fibers are dislodged, displaced or distorted in such a manner as to show writing sequence.

4.6. Examine the depressions in the paper formed by the writing instruments to see if the continuity or interruption of the wall or trough indicates line sequence. Observe skipping of the later stroke, narrowing of the later stroke where the two lines meet and ink loading.

4.7. Examine the reverse side of the document at the line crossing to study the embossing (if present).

4.8. If the line crossing involves carbon film typewritten impressions, lifting of the carbon may be necessary. However, this is a destructive process and the necessary approval must be obtained before destructive testing can be done.

4.9. Examine folded and creased areas of paper where line sequence is questioned by noting any breakage of the ink line, skipping or "globbing" of the ink or leaching out of the ink into the disturbed paper fibers.

4.10. The ESDA may be used in the determination of line sequence by seeing if it can determine which writing impressions give a continuous impression on the ESDA prints.

4.11. Look for a "waisting effect" that sometimes occurs when a non-luminescing ballpoint ink crosses a luminescing ballpoint ink. This effect is the result of the second pen entering the groove of the first.

4.12. When examining a ballpoint pen/toner intersection, use a ring light with the microscope. The light should be perpendicular to the paper surface. If the ink is on top a specular reflection will occur at the intersection. It does not occur if the ink is underneath. It may be possible to see the ink line if the toner, which is on top, is carefully scrapped away (this is a destruction examination); however, this should not be done with aqueous inks that can seep through the tone particles to the paper surface.

4.13. Many factors influence the determination of line sequence problems and this type of examination warrants extreme caution. Some of these factors include, but are not limited to, the fluidity and drying time of writing materials and ink, pressure used to produce lines, colors of the ink (dark lines almost always appear to be on top, even when they are not) and the particular combination of paper, pens, pencil, carbon, etc. used.

4.14. Make written notes of the procedures used, pertinent observations, and any similarities and/or dissimilarities. Measurements should be taken when appropriate (all measurements are approximate).

4.15. Formulate a conclusion based on all the evidence examined.

4.16. The bases and reasons for the conclusion(s), opinion(s), or finding(s) should be included in the examiner's work notes and may be also included in the report.

5. Quality Assurance and Controls

5.1. A test of the VSC or ESDA will be completed on the day of the examination. The results of the test will be documented in the examiner's notes.

5.2. The opinions given must be verified by another qualified forensic document examiner. The verification will be documented in the case record.

5.3. The case record will be technically reviewed by another qualified forensic document examiner.

5.4. The case record will be administratively reviewed by a supervisor or acting supervisor.

5.5. The examiner, technical reviewer, and administrative reviewer will complete a case record review form.

6. References

6.1. Shiver, Farrell, "Line Intersections," article in the Wiley Encyclopedia of Forensic Science, John Wiley & Sons, Ltd, Chichester, United Kingdom, 2009.

6.2. ANSI/ASB Standard 044, First Edition 2019 Standard for Examination of Documents for Indentations