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

1. Scope

1.1 This standard provides procedures that should be used by forensic document examiners (SWGDOC Standard for Scope of Work of Forensic Document Examiners) for examinations and comparisons involving single-strike film ribbons with typed text and related procedures.

1.2 These procedures are applicable whether the examination and comparison is of questioned and known items or of exclusively questioned items.

1.3 These procedures include evaluation of the sufficiency of the material submitted for examination.

1.4 These procedures are also generally applicable to examinations of lift-off and cover-up correction tapes and sheets.

1.5 These procedures may also be applicable (in whole or in part) to examinations of carbon paper and carbon copies or of documents produced with certain non-impact printing devices (for example, printing devices using a thermal imaging transfer ribbon).

1.6 The particular methods employed in a given case will depend upon the nature of the material available for examination.

1.7 This standard may not cover all aspects of unusual or uncommon examinations.

1.8 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory requirements prior to use.*

2. Referenced Documents

2.1 *Standards:*

ASTM E1732 Terminology Relating to Forensic Science

ASTM F221 Terminology Relating to Carbon Paper and Inked Ribbon Products and Images Made Therefrom

ASTM F909 Terminology Relating to Printers

ASTM F1623 Terminology Relating to Thermal Imaging Products

SWGDOC Standard for Scope of Work of Forensic Document Examiners

SWGDOC Terminology Relating to the Examination of Questioned Documents

3. Terminology

3.1 *Definitions*—For definitions of terms in this standard, refer to Terminology E1732 and SWGDOC Terminology Relating to the Examination of Questioned Documents.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *cover-up correction, n*—see overprint correction.

3.2.2 *fracture pattern, n*—the spatial arrangement of each complementary edge formation created when a single object is separated into two or more fragments.

3.2.3 *impact printer, n*—a printer in which printing is the result of mechanical impacts. F909

3.2.4 *impression, n*—an image formed by pressure.

3.2.5 *lift-off correction, n*—the removal of a typed character by restriking with the same character while interposing an adhesive coated tape or sheet, thereby causing the imprinted character to adhere to the coating and be stripped from the record-medium.

3.2.6 *multi-strike film ribbon, n*—a ribbon wherein the substrate film such as polyester is coated or impregnated with an ink which allows several different imprints to be made from multiple overstrikes on the same location on the ribbon, and still result in full characters being printed. F221

3.2.7 *original typed text, n*—typed text imprinted onto the surface of a record-medium as the result of the impact of a type-face striking directly or through a ribbon.

3.2.8 *overprint correction, n*—the removal of a typed character from the text by restriking with the same character while interposing a tape or sheet coated with an opaque coating material, thereby causing the imprinted character to be covered by the coating.

3.2.9 *paper fiber impression, n*—the imprint of a paper fiber in the ribbon substrate.

3.2.10 *record medium, n*—a piece of material, usually paper, on which an image is recorded.

3.2.11 *single-strike film ribbon, n*—an inked ribbon wherein the substrate is a plastic film material such as polyethylene, where each area of the ribbon is capable of producing only one image. F221

3.2.12 *thermal imaging transfer ribbon, n*—plastic film or other material, upon which a dye or pigmented coating is applied; imaging results when a thermal printhead transfers the coating onto a suitable substrate or receptor media. F1623

4. Significance and Use

4.1 The procedures outlined here are grounded in the generally accepted body of knowledge and experience in the field of forensic document examination. By following these procedures, a forensic document examiner can reliably reach an opinion concerning whether a particular single-strike ribbon or lift-off correction tape was used in the preparation of a specific typed text.

5. Interferences

5.1 Certain items submitted for examination may have inherent limitations that can interfere with the procedures in this standard. Limitations should be noted and recorded.

5.2 Limitations can be due to submission of non-original documents, limited quantity or comparability, or condition of the items submitted for examination (for example, the condition of the ribbon or the paper, or both). The nature of the paper can affect the quality and quantity of fiber impression(s) as well as ink transfer and retention. Such features are taken into account in this standard.

5.3 The results of prior storage, handling, testing, or chemical processing (for example, for latent prints) can interfere with the examination of certain characteristics.

6. Equipment and Requirements

6.1 Appropriate light source(s) of sufficient intensity to allow fine detail to be distinguished.

NOTE 1—Natural light, incandescent sources, fiber optic light standards and sources are generally utilized. Transmitted lighting, side lighting, and vertical incident lighting have been found useful.

6.2 Magnification sufficient to allow fine detail to be distinguished.

6.3 Other apparatus as appropriate.

NOTE 2—The use of a comparison microscope or optical comparator (or the equivalent electronic imaging equipment) can facilitate certain of these examinations. Polarizing filters (polars) have been found to be useful.

6.4 Imaging or other equipment for recording observations as required.

6.5 Sufficient time and facilities to complete all applicable procedures.

7. Procedure

7.1 All procedures shall be performed when applicable. These procedures should be performed in the order given.

7.2 Examinations performed, relevant observations, and results shall be documented.

7.3 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.

7.4 Determine whether any original typed text is present.

7.4.1 If no original typed text is present, a paper fiber examination is not applicable. When the non-original typed text is of sufficient quality, a limited fracture pattern comparison of gross features may be possible.

7.5 Determine the type of ribbon used to prepare the typed text on the document.

7.5.1 If fabric or multi-strike film ribbon, discontinue these procedures and report accordingly.

7.6 Determine, if possible, whether the ribbon type is consistent with the original typed text (for example, lift-off compatible or permanent).

7.7 Determine if the type style on the document is present on the ribbon.

NOTE 3—A ribbon can contain more than one style of type.

7.8 Determine whether the text on the document is present on the ribbon. This can be determined by visual inspection or by the use of an automated ribbon reading device or system.

7.9 Determine whether the text on the ribbon and the text on the document match in all details, including errors and corrections.

NOTE 4—When untransferred ink is missing from the film substrate and the text is difficult to read, viewing the ribbon between crossed polars can help in visualization of the typed text in the substrate film.

7.10 Determine whether the fracture pattern of characters on the ribbon match those of corresponding characters on the document.

7.11 Determine whether there are areas of untransferred ink within the void area of a character on the ribbon that match a void within the outline of the corresponding character on the document.

7.12 Determine whether there are impression(s) of paper fibers within the void area of a character on the ribbon that match paper fibers within the inked area of a corresponding character on the document.

NOTE 5—Viewing the ribbon between polarizing filters can help in visualization of paper fiber impressions in the substrate film.

7.13 Evaluate fracture pattern and paper fiber matches and discrepancies, and any limitations. Determine their significance individually and in combination.

8. Report

8.1 The conclusion(s), opinion(s), or findings resulting from the procedures in this standard may be reached once sufficient examinations have been conducted. The number and nature of the necessary examinations is dependent on the question at hand.
8.2 The bases and reasons for the conclusion(s), opinion(s), or finding(s) should appear in the examiner's documentation and may also appear in the report.
8.3 *Identification*—When the examination reveals no significant, inexplicable differences between the ribbon and the typed text, and there is significant agreement in all individualizing characteristics, an identification is appropriate.
8.4 *Elimination*—If significant, inexplicable differences between the ribbon and typed text are found at any level of the analyses, an elimination is appropriate.
8.5 *Qualified Opinions*—When there are limiting factors and the examination reveals similarities or differences of limited significance between the ribbon and typed text, the use of qualified opinions can be appropriate.
8.6 *No Conclusion*—When there are significant limiting factors, a report that no conclusion can be reached is appropriate. This opinion requires explanation of the limiting factors.
8.7 Agreement of typestyle(s) or relevant text, or both shall be reported.
9. Keywords
9.1 forensic sciences; fracture patterns; paper fiber impression; questioned documents; single-strike film ribbon