J4 Determination of the Sequence of Non-Intersecting Lines From Laser Toner Particles and Pen Ink by Stereomicroscope

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After attending this presentation, attendees will better understand the Leica® EZ4 stereomicroscope and its use in determining the sequence of non-intersecting lines.

This presentation will impact the forensic science community by discussing the Leica® EZ4 stereomicroscope's use as a magnification tool for the determination in the sequence of non-intersecting lines.

In cases involving a document signed for one purpose that has then been turned into a promissory note, determination of the sequence of the intersecting lines contributes significantly to the analysis of the case. In the absence of such a situation, determination of whether the ink, toner, and/or mechanical parts of a printer or photocopy device used in creating promissory notes overlap the signature provides significant information in the fraud investigation process. In this study, a case using the Leica® EZ4 stereomicroscope and the results of determining the sequence of non-intersecting lines will be discussed.

Case: An original promissory note in the amount of $500,000 was issued on January 14, 2009, by the creditor M.Ü. to the debtor E.H.İ. with a payment date of August 15, 2013. A second original promissory note with an issue date of January 14, 2009, by the creditor M.Ü. to the debtor E.H.İ. with a payment date of September 15, 2013 was also submitted for examination. Each promissory note contained the signature of the creditor and both signatures were examined.

In the physical examination of the notes, it was determined they were not press-printed and the lower and upper edges of the bills were not form-cut. For the note with the payment date of August 15, 2013, the horizontal width was 21cm (A4 size), the left-side height was 9.6cm, and the right-side height was 9.4cm. The horizontal width of the note dated September 9, 2013, was 21cm (A4 size), the left-side height was 10.1cm, and the right-side height was 10.2cm. With notes that are standard size and are not press-printed, fraud can be committed by using a signature placed on a blank sheet in three locations: before printing the promissory note text, between the text on the upper part, and between the text on the lower part.

Examination of the two notes using the Leica® EZ4 stereomicroscope and the S520® Document Detector CTMS® document examination device, print traces and light ink reflections and dispersions on the signatures of the documents were observed. Based on this examination, it was determined that the signatures and names were created with pen. There was no evidence of physical and chemical deletions on the documents. In the examinations performed, toner dispersions and traces were left by the laser writer on the printed letters and line frames on the documents. It was detected that there were partial losses in the letter-number characters due to the device and toner used (some parts of letters and numbers were not printed) and there was an intense heterogenic toner particle distribution which covered the entire front side of the document. Toner particles were observed intensely on the entire surface of the document in the areas where printing traces of the signature was not present, but were not observed in the large parts where internal deep printing traces of the signature were located. In the examination performed with stereomicroscope, the debtor signatures on the notes were written in ink on the paper first and the promissory note text was printed afterward above these signatures through a computer and laser writer.

Considering the width of the paper, a blank A4 paper or a paper with a letterhead and/or text was signed, then the promissory note text was printed via a computer and a laser writer, followed by the present notes being created by cutting the upper and lower parts of the paper.

The most distinctive finding in this instance in terms of fraud is the toner particles over the signature lines and the absence of these particles under the ink which demonstrates that the note was printed after the signature. The fact that the promissory note was cut not only from one side but from both the upper and lower sides of the paper is the second finding for this determination.

Sequence of Writing/Printing, Toner Particles, Ballpoint Pen Ink

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