

# ABSTRACTS

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### **Conducting a Forensic Examination of Electronically Captured Signatures**

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The Uniform Electronic Transactions Act (UETA-1999) gave electronic signatures the same legal weight, as original (hand-made) signatures. As a result, a proliferation of signature capture devices has entered the market place. One of the most commonly used capture devices is the electronic signature tablet, which acquires electronic versions of signatures executed as part of a transaction. Typically, these electronic representations of a signature are embedded (or associated with) the document requiring the signature in such a way as to prevent tampering. Research conducted by the author for Topaz Systems, Inc. (a leading producer of electronic signature tablets and software) and studies necessitated by actual casework, have shown that signatures captured at a rate of 100Hz or faster contain sufficient detail and fidelity to arrive at reliable forensic conclusions as to authorship. In addition, Microsoft Excel™ can be used to produce very accurate graphical plots from the captured raw data.

### **Stone Paper: An Overview of its Characteristics and the Impact They May Have on Forensic Document Examinations**

Haley A. Elliott, M.F.S. and Lisa E. Stadmeier, M.S.F.S.

Stone paper is comprised mainly of calcium carbonate and plasticizers. Unlike pulp paper, it is manufactured without large amounts of water and chemicals. Due to its unique composition and manufacturing process, stone paper manufacturers claim it is: more environmentally friendly than traditional pulp paper, 100% recyclable, water, grease and tear resistant, and bio-degradable. Stone paper has been commercially available for ten years, and in the past three years has become increasingly available in household consumer-use products including notebooks and inkjet photo paper. As it becomes more available, the forensic community will likely encounter stone paper in casework. This article seeks to educate the forensic document community about stone paper characteristics, evaluate some of the manufacturers' claims outlined above, and describe special considerations that must be taken during forensic document examinations involving stone paper. Actions and associated examinations undertaken include: indented impressions, typewriting, non-destructive ink (writing instruments, toner and inkjet printing) examination, tearing, folding and stapling, water and grease interaction, and environmental exposure. Results of the current study showed that examination of stone paper can be conducted in a manner similar to traditional pulp paper, with a few exceptions regarding indented impression examinations and fracture matching.

### **Statistical Evaluation of the Reproducibility and the Influence of Paper on the Analysis of Black Gel Pen Ink Using Laser Desorption Ionisation Mass Spectrometry**

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Laser desorption ionisation mass spectrometry (LDI-MS) has demonstrated to be an excellent analytical method for the forensic analysis of inks on a questioned document. The ink can be analysed directly on its substrate (paper) and hence offers a fast method of analysis as sample preparation is kept to a minimum and more importantly, damage to the document is minimised. LDI-MS has also previously been reported to provide a high power of discrimination in the statistical comparison of ink samples and

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has the potential to be introduced as part of routine ink analysis. This paper looks into the methodology further and evaluates statistically the reproducibility and the influence of paper on black gel pen ink LDI-MS spectra; by comparing spectra of three different black gel pen inks on three different paper substrates. Although generally minimal, the influences of sample homogeneity and paper type were found to be sample dependent. This should be taken into account to avoid the risk of false differentiation of black gel pen ink samples. Other statistical approaches such as principal component analysis (PCA) proved to be a good alternative to correlation coefficients for the comparison of whole mass spectra. **Keywords:** Ink Analysis; LDI-MS; Reproducibility; Paper; Gel Pens; Questioned Document

## **SCANNED IMAGES: How Well Do They Depict the Subtle Features in Handwriting?**

**Janet Fenner Masson**

It is increasingly common for companies and government agencies to retain scanned images of documents in lieu of originals. In many instances, the original document is destroyed after imaging. As a result, the best image of a document may be a digital image. This project is not intended to be an inquiry into the parameters document examiners should use in scanning documents for their own records. Rather, it is a study of digital images captured using guidelines like those utilized by companies and agencies in maintaining records. A study was made to determine which features are reliably and accurately depicted in these scanned images and which are not. A comparison of the image quality obtained using various scanning parameters and transmission methods was made. In addition, examinations from originals, from first-generation photocopies, and from scanned images were considered.