



Questioned Documents Section – 2003

J2 The Faces of Ink Jet: As Seen Through the Eyes of a Forensic Document Examiner

Bridgette T. Frost, MFS, and Meredith A. DeKalb, MFS*, Federal Bureau of Investigation, 935 Pennsylvania Avenue, NW, Washington, DC*

The goals of this presentation are to explore the latest of ink jet technology and to demonstrate that technological advancements have improved print quality but not precluded the forensic document examiner from identifying an ink jet product.

Forensic document examiners are routinely asked to determine the printing processes on various types of documents. Ink jet is a digital print technology that has been commercially available for a couple of decades and has been examined by the forensic document examiner for equally as long. As technology advances and costs decline, good quality color ink jet printers at the home and office are becoming the norm. It is a challenge, if not an impossible task, for a forensic document examiner to stay abreast of industry changes and innovations. The technology of stimulating ink to form a droplet that is directed onto a substrate is divided into two methodologies: continuous and drop on demand. The science of ink jet can be further subdivided into a dizzying array of applications including: binary deflection, multiple deflection, hertz, piezoelectric, thermal, acoustic, and electrostatic. The wide range that exists in the industry has various pros and cons. These differences may distinguish one company or model from another, but does it change the visual product? The science of ink chemistry adds another factor to the diversity of ink jet print devices. Additionally, with varied types of paper commercially available, individuals are using ink jet technology on everything from photographs to checks. The science of ink jet technology can be discussed at length; however, what it comes down to for the forensic document examiner is: "Does ink jet still look like ink jet?" When examining an ink jet document under magnification a forensic document examiner expects to see the following characteristics: absorption and bleeding into the paper fibers, over spray, stepped edges, and a lack of embossing. The questions this paper will address are: "Has technology changed the appearance of ink jet on paper?" and "Does a change in paper significantly change the appearance of ink jet?" Photomicrographs of ink jet print products on various types of paper surfaces will be displayed and their visual appearances described and discussed. Though the minutia of ink jet technology is constantly evolving, the basic principle remains the same. It can be easily deduced that if the basic principle changes it would become a different print process. Though the quality of the printed product has improved significantly over time, it is believed that forensic document examiners can still recognize an ink jet product under their microscopes.

Inkjet, Document Examination, Digital Printing