IIA1: Inks

I. INTRODUCTION

Ink examinations typically involve the differentiation of ink samples found on possible altered documents (Refer to Alterations and Obliteration's). However, an investigator may request many types of ink examinations. These would include, but are not limited to, the examination and comparison of ink found in a writing instrument to a questioned letter or the examination and comparison of inks found on genuine and counterfeit documents.

II. INSTRUMENTATION

Magnification loop, stereo microscope, comparison microscope, adequate lighting, dichroic filters, and alternate light sources (See Appendix VI).

III. MINIMUM STANDARDS & CONTROLS

Refer to Appendix I.

IV. EXAMINATION PROCEDURE

A. Non-destructive techniques:

1. Visual examination using appropriate magnification: Differentiate by type of ink, color, width of line or striations. Care must be taken that differences exist because of instrument, not pressure or speed of writing.
2. Ultraviolet: Examine visually, with magnification if necessary. Differentiate by fluorescence or color
3. Infrared: Examine with the VSC 6000/HS using magnification as necessary. Differentiate by visibility, transparency or intensity.
4. Infrared Luminescence: Examine with the VSC 6000/HS. Differentiate by presence or absence of luminescence, by presence or absence of dark image, or by intensity of luminescence or dark image. Care must be taken in differentiation by luminescence, because an ink that is not normally luminescent may become dequenched, and thereby luminescent by a number of different substances. The background and/or paper can also affect the luminescence of inks. If the obliterated or altered material luminesces it may be visible from the reverse side of the document. Liquid nitrogen enhances IR luminescence, makes paper more transparent, and neutralizes the adhesive bond of glues.
5. Use the dichroic filters to determine if there is a difference in visibility, transparency or intensity.
6. Use the Microspectrophotometry capability of the VSC 6000/HS to differentiate by comparing an inks spectrum for absorption, transmission, reflectance or fluorescence.

B. Destructive techniques:

Destructive techniques will not be used in the CMPD Crime lab for ink examinations. If results are inconclusive after using non-destructive techniques then the customer will be notified and also be advised on an external agency that may be able to conduct further examination utilizing a destructive method. Any conversation will be noted in the case file.

C. Report conclusions:

If inks can be differentiated using any of the techniques listed above then it will be reported that the inks do not have a common origin. If the inks cannot be differentiated then it will reported that "there is an inability to distinguish the ink samples at this level of analysis" or "physical testing at this level failed to detect any differences between the ink samples." All ink examination reports will include the different methods utilized in the examination process. No ink examination will be reported out that the inks match, are identical or the same.

REFERENCES

1. ASTM E 1658-04, *Standard Guide for Expressing Conclusions for Forensic Document Examiners*
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4. Foster and Freeman, LTD. VSC 6000 Video Spectral Comparator Software Manual, November 2011
5. Hilton, O. *Scientific Examination of Questioned Documents;* Elsevier: N.Y., 1982; pp 24, 25, 32-48, 75-84.
6. Harrison, W. R. *Suspect Documents;* Nelson-Hall: Chicago, IL, 1981; pp 6-27, 92.
7. *Journal of Forensic Sciences;* JFSCA, January **1982**, Vol 27, No 1, pp 196-199.
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9. Questioned Document Section Article Library

History	Issue Date	Section(s) Revised
Original Issue	11/18/99	N/A
1st Revision	4/15/11	II, IVA through IVC and References
2nd Revision	6/2/11	Added Division to Header and Issuing Authority to Footer
3rd Revision	8/30/11	Removed "consistent" from Report Conclusions and added ASTM consistent terminology.

Approval

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Issuance

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