FTP 05 Equipment

A. Purpose

This manual describes procedures, performance checks, and maintenance for equipment used in the footwear and tire track discipline.

B. Scope

This document provides the analyst with information on how to properly use, perform a maintenance check and maintain the equipment used by the footwear and tire track discipline.

C. General Procedures

1. Validations and Performance Checks
    a. Validations
        i. Validations will be performed in order to bring any new instrumentation into service or to implement a new method of analysis.
        ii. A summary of the results of the validation will be reviewed and signed by the performer, TL, and Quality Director.
        iii. The summary will be uploaded into Resource Manager and the date will be documented in a performance check action.
    b. Performance Checks
        i. Performance checks will be performed in order to bring any new equipment into service or to check that small changes to equipment or associated methods have not affected the expected results of that equipment.
        ii. A summary of the results of the performance check will be reviewed and signed by the performer, TL, and Quality Director.
        iii. The summary will be uploaded into Resource Manager and the date will be documented in a performance check action.
2. Quality Control Checks
    a. Instrument / Equipment Quality Control (QC) checks will be performed as described in the CBI-FS Footwear and Tire Track Routine Maintenance Schedule (see FTP Appendix B – Equipment Maintenance Schedule).
        i. The results will be documented as a “Pass” or “Fail” in Resource Manager as an Instrument / Equipment QC action.

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ii. If the Instrument / Equipment (QC) check fails, the following steps should be followed:
   1) Notify the Lab Manager, Latent Print Technical Leader, or Footwear / Tire Technical Leader.
   2) Take the instrument / equipment out of service and put a sign on the instrument / equipment stating something similar to "NOT IN USE".
   3) Contact the instrument / equipment company to assist with fixing the problem.
   4) Initiate an Incident Review (IR) describing the incident.
   5) Document the "Fail" in the Resource Manager along with a comment regarding the issue.

b. Instrument / equipment (QC) checks for instrument / equipment utilized for footwear / tire track processing are performed simultaneously with reagent checks. (see FTP 06 Reagents, Chemicals, Solvents or Standards)

c. Equipment that is used by both the Latent Print Sections and the Footwear / Tire Track sections may be utilized, maintained, and documented under the either discipline.

d. Equipment that is entered into the Resource Manager and used in the course of footwear and tire track processing will have the name of the equipment documented in the Footwear and Tire Track worksheet.

3. Maintenance

a. Instrument / equipment preventative maintenance will be performed as needed, or as described in the Footwear / Tire Tack Routine Maintenance Schedule (see FTP Appendix B – Equipment Maintenance Schedule).
   i. The results will be documented in the Resource Manager as a Preventative Maintenance action or documented on the Preventative Maintenance Sheet.
   ii. A comment describing what maintenance was performed should be documented in the Preventative Maintenance action.

b. Instrument / equipment maintenance / service that is provided by an outside vendor or source:
   i. The results will be documented in Resource Manager as a Maintenance / Service action.
   ii. A comment describing what maintenance was performed should also be documented as a Maintenance / Service action.

iii. A performance check will need to be performed and documented in Resource Manager following a documented maintenance service.

c. Filter changes for any instrument / equipment may be documented under either preventative maintenance or maintenance / service in Resource Manager.

d. Equipment that is used by both the Latent Print Sections and the Footwear / Tire Track Sections may be maintained under either discipline.

e. Manufacturer provided software will be utilized if required and updated as needed.

D. Equipment

1. The Footwear/Tire Track section is housed in the Latent Print section of the laboratory and shares much of the latent print section's equipment. Please reference the "FIN 05 Equipment" DOM for guidance on equipment purchased by the Latent Prints Section such as various alternate light sources, lasers, humidity chambers, scales, and more. The following section references equipment specifically purchased and maintained by the Footwear/Tire Track section. Equipment from any section can be added to the resources of a worksheet.

2. Digital Cameras: Digital Cameras may be used in the laboratory for the documentation of evidence and impressions. The cameras can be used in conjunction with the alternate light sources. The cameras can be adjusted to meet exposure needs and can be used in various modes at the discretion of the forensic scientist.

   a. Use/Operation of Equipment

      i. Prior to using this equipment, the manufacturer provided instruction manual should be read, if available. The manuals will be in the Latent Print Section or the Footwear and Tire Impression Section.

      ii. Comparison quality images will be saved as Tagged Image File Format (.TIFF) files or other comparable lossless file type. Images for documentation purposes only may be saved in other formats (.JPEG, .PDF, etc.), but must be of sufficient resolution to read any annotations.

      iii. Several chemical processes may require that the developed impression be photographed with an alternate light source or a laser. This may require the use of various camera filters to acquire the best image. Some of the filters and their uses are as follows:

         1) Green filter – may be used to increase contrast when impressions have been developed with Ninhydrin

         2) Orange or yellow filter – may be used when photographing impressions that have been stained following cyanoacrylate fuming.

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3) Misc. filters – may be used to eliminate contrasting backgrounds.

3. Flat-Bed Scanners: Images may be captured using a flat-bed scanner. Items that may be scanned include, but are not limited to: lift cards, test impressions, and impressions on documents.
   a. Use/Operation of Equipment
      i. Prior to using this equipment, the manufacturer provided instruction manual should be read, if available. The manuals will be in the Latent Print Section or the Footwear and Tire Impression Section, if available.
      ii. Known test impressions will be scanned in at a similar dpi to the submitted questioned images for comparison with a minimum quality of 300dpi.
      iii. Scannable questioned impressions deemed suitable for comparison will be scanned at a minimum quality of 600dpi for footwear and 300dpi for tire tracks due to file size constraints of the LIMS system.
      iv. Scans for documentation purposes only may be scanned at 300dpi, but must be of sufficient resolution to read any annotations.
   b. Maintenance will be performed as needed.
4. Large Scale Printer: The large scale printer is primarily used to print comparison materials for tire track images that have been resized using a scale within the image to print actual size.
   a. Use/Operation of Equipment
      i. The printer takes a long time to boot up and perform a multitude of checks. Please allow sufficient time for it to complete this full process.
      ii. Ensure the desired medium is loaded and that there is enough on the roll (i.e. paper or transparency sheets).
      iii. It is recommended to include a photographed scale in the printable area so that you can check the accuracy of the printing size against a physical scale once printed.
   b. Maintenance
      i. There are multiple types of maintenance that can be performed by the analyst as needed.
         1) There are multiple toner cartridges that need changing when empty.
         2) There are additional cleaning cartridges that may need changing when prompted.
         3) The paper type can be swapped out as needed by the analyst.
      ii. If other errors are encountered, a technician may need to be called in to repair the printer.
5. Light Sources: Flashlights may be used for viewing evidence with oblique lighting and to provide additional lighting as needed. Additional light sources, such as alternate light sources, lasers, and linear light sources can also be used for viewing evidence with oblique lighting. See FIN 05 Equipment for operation and maintenance guidance on all light sources maintained by the latent print section.
   a. Crime Lite 82 L® (Linear Light Source)
      i. Use/Operation of Equipment

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1) The Crime Lite 80L® may be used for viewing an item with oblique lighting and to provide additional lighting, as needed. It can be powered by included rechargeable batteries or a plug-in power supply.
2) Contrast may be achieved by slightly adjusting the angle in which the light contacts the surface of the item. The illumination should be viewed at several angles to determine where the best image can be produced.
3) Contrast may also be achieved by using various magnetic colored filters which are housed in the carrying case.

ii. Maintenance
1) Replace as needed

6. Image Processing Software (i.e. Adobe Photoshop®)
a. Use / Operation of Equipment
i. The history tracker must be turned on and the information must be retained.
ii. An original image, where applicable, must be preserved in a lossless file format.
iii. A processed image, where applicable, must be retained as a working copy of the original image.
1) The Adobe Photoshop® layers tool may be utilized on the original image to document and retain the adjustments and/or notes made (i.e. working copy), while still retaining the original image as the background layer.
2) Images used for forensic comparisons will be saved as Tagged Image File Format (.TIFF) files or another comparable lossless file format. Images that are only for documentation purposes may be saved in other formats (.JPEG,.PDF, etc.), but must be legible.

iv. Refer to the manufacturer provided instruction manual for additional information.
b. Software Utilized
i. Adobe Creative Cloud is a cloud-based software which provides regular updates to the latest versions of Photoshop® and related software.
c. Maintenance
i. Update as needed

7. SoleMate FPX software
a. Use / Operation of Equipment
i. When a user first opens the FPX after the initial installation, the user will be required to connect to the SoleMate database, read and accept the End-User License Agreement and be licensed by the FPX Administrator.
ii. Ensure all databases are selected for searching prior to beginning a search.

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iii. In order to search, you must first specify the search criteria by clicking 'Search' in the Menu Bar.
iv. The user will be able to search by a number of different categories, to include but not limited to:
1) Brand
2) Model
3) Category
4) Unique features
5) Shape
6) Logo
7) Text
v. By searching with the different categories, SoleMate will search the database for the best results.
vi. Once the Search has been specified, the user can view the Search Results.
vii. If a search is conducted in SoleMate, it will be documented in the worksheet.

b. Software Utilized
1) SoleMate FPX

8. Measuring Devices
a. Use / Operation of Equipment
i. Rulers and Calipers may be utilized in the processing, comparison, and documentation of evidence to compare distance measurements.
ii. These devices do not produce results or data that are analytically significant or strictly relied upon for conclusions listed in the testing reports.
b. Maintenance
i. Replace if damaged

9. Electrostatic Dust Lifter (ESDL): The ESDL is used for collection of dry origin (dust) impression evidence.
a. Use/Operation of Equipment
i. Instructions should be read and understood prior to use of this equipment.
ii. Place the black side of the collection film over the impression or area to be collected.
iii. Place the provided metal plate next to the collection film and place the ESDL unit on the metal film and collection film, as directed.

iv. Power on the ESDL to apply the electric charge to the collection film.
v. Turn off the power and lift the collection film and examine the black side with oblique lighting.
vi. Photograph the results as needed (note that the image will be reversed).

b. Maintenance
i. Replace batteries as needed

10. Microscopes: Microscopes are used to more closely observe the surface of a footwear outsole or tire tread to examine and compare potential wear and randomly acquired characteristics.
a. Use / Operation of Equipment
i. Adjust height of the scope, lighting, and magnification to achieve focus of the desired surface.
ii. If capturing an image for documentation purposes, confirm that the same magnification is set on the software as is set on the microscope to ensure any scale bars or measurements accurately correspond.
b. Software Utilized
i. Leica Application Suite®
c. Maintenance
i. Clean and align as needed.
ii. Replace lighting as needed.

E. References

1. FTP 06 Reagents, Chemicals, Solvents or Standards
2. FTP Appendix B – Equipment Maintenance Schedule
3. Manufacturer provided instruction manuals