



ATF-LS- FB02 Alternate Light Source.docm	Published Online: March 2018
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1. Scope

Various body fluids will fluoresce in the presence of certain wavelengths of light. An Alternate Light Source (ALS) utilizes specific wavelengths of light to help locate body fluid stains on clothing or other items of evidence. Semen, saliva, vaginal fluid, and perspiration all fluoresce when using an ALS, while blood may appear darker. The ALS can be used to supplement the visual examination of evidence exhibits. Stains located using an ALS can be marked for further serology/DNA testing. Stained areas located with the aid of the ALS are not identified as biological material based on the ALS alone. If no stained areas are observed on an exhibit based on visual and ALS-aided examination, it does not mean that no biological material is on the exhibit, it only indicates that no biological material was observed.

2. References

The procedures described here are derived from a variety of sources. Portions of the protocol come directly from some of the references cited below.

- 2.1. SPEX Forensics HandScope Xenon Operation Manual, March 2006.
- 2.2. Federal Bureau of Investigation Laboratory Serology Protocol Manual, Procedure for the Application of an Alternate Light Source to Aid in the Detection of Biological Fluids, July 2006.
- 2.3. R. Saferstein, The identification of semen and other body fluids, in: Forensic Science Handbook, Vol. II, second ed., Prentice Hall, Upper Saddle River, 2005, pp. 330-331.
- 2.4. E. Springer, J. Almog, A. Frank, Z. Ziv, P. Bergman, W.G. Qiang, Detection of dry body fluids by inherent short wavelength UV luminescence: preliminary results, Forensic Sci. Int. 66 (1994) 89-94.

3. Equipment

- 3.1. Disposable Gloves
- 3.2. Colored UV protective goggles
- 3.3. Lab coat
- 3.4. HandScope® Xenon HSX-5000 or other approved ALS
- 3.5. Known positive controls (semen and saliva) and negative control
- 3.6. 10% bleach solution
- 3.7. 70% ethanol
- 3.8. Bench paper

4. Safety/Quality Assurance

- 4.1. Wear appropriate UV-blocking goggles while using the ALS.
- 4.2. Do not stare directly into the light as this can cause damage to the eyes.
- 4.3. Do not block the exhaust fan on the rear panel as light may overheat.
- 4.4. A lab coat must be worn at all times while performing this procedure.
- 4.5. Disposable gloves shall be worn when handling reagents and evidence.
- 4.6. View a positive control (semen and saliva) and a negative control (unstained cloth) before examining evidence with the light. The wavelength(s) and goggles used, along with the results of the controls, shall be documented in the casework notes.
- 4.7. When practical, only one item of evidence shall be open at a time.
- 4.8. Clean the ALS with a wipe dampened with 70% ethanol. Do not use bleach to clean the ALS.
- 4.9. The laboratory bench surface shall be cleaned before and after use with 10% bleach solution followed by 70% ethanol. Fresh bench paper shall then be placed on the surface prior to examination.
- 4.10. Minor deviations from the protocol may be made at the analyst's discretion based on the analyst's training and experience and should be indicated in the analyst's notes. Significant deviations from the protocol must be approved by the DNA Technical Leader.

5. Procedure

- 5.1. Plug the ALS into the Power Supply or Battery Pack.
- 5.2. Set the light at 450 nm by rotating the filter wheel on the top of the light to 450.
NOTE: When using the light at 450 nm, wear the orange protective goggles.

NOTE: If other wavelengths of light are used, refer to the appropriate ALS operation manual for the correct colored goggles to wear with those wavelengths.

- 5.3. Adjust the collimator, if necessary, to focus the light to a spot-size suitable for the evidence.
- 5.4. Examine evidence using the ALS; observed stains may be marked. Serology testing may be performed on these stains if necessary.