TECHNICAL INFORMATION

Ardrox Fluorescent Enhancement Dye

Catalog No. LVS600, LVS700

INTRODUCTION

Ardrox is a fluorescing dye useful in the enhancement of latent fingerprints developed with cyanoacrylate fuming. It is especially effective on surfaces with confused backgrounds that increase the difficulty in the visualization of ridge detail under normal lighting. Ardrox is suitable for field and lab use. It does not function well on highly fluorescent backgrounds and may be absorbed into some substrates causing them to be highly fluorescent.

Ardrox is available as a pre-mixed liquid and as a liquid concentrate. Both offer a relatively long shelf life.

CAUTIONS

- Before using this product, consult the appropriate Material Safety Data Sheets (MSDS) found on our website at www.sirchie.com/support.

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- Wear protective latex gloves and clothing, including protective eyewear when preparing or using Ardrox.
- Ardrox solution is toxic and should be mixed and used in a fume hood, in an area with adequate ventilation or with an appropriate respirator.
- Extinguish all smoking materials and open flames before use.

BACKGROUND

In recent years, spectacular results have been achieved in the enhancement of latent prints through the use of fluorescent reagents in combination with forensic light sources. Ardrox combines chemically with polymerized cyanoacrylate prints to form compounds that fluoresce under ultraviolet (UV) light. Viewing must be in a darkened room, and the resulting print will be seen to glow against a dark background. Ardrox should only be used on prints that have been developed using cyanoacrylate-fuming techniques. For detailed information on cyanoacrylate fuming, see the technical information supplied with the individual cyanoacrylate products.

Because of their translucent, whitish appearance, developed cyanoacrylate prints generally require enhancement before they can be successfully recorded. Ardrox may be sprayed or brushed onto the developed prints, or the surface containing the prints may be immersed in the solution. Regardless of the method of application, allow at least one minute for the dye to set. Ardrox-enhanced prints may be visualized using long or shortwave UV light or with BLUEMAXX™ illumination.

Cyanoacrylate developed latents enhanced with Ardrox fluoresce with BLUEMAXX™ illumination.

PROCEDURE

Creating A Working Solution for LVS700

The following formula makes 100ml of solution. If you are using the Cat. No. LVS600 spray solution, skip to **Application of Ardrox.**

1. Place 6ml of Ardrox concentrate into a clean beaker capable of holding at least 150ml of liquid.
2. Place 100ml of methanol into a second clean beaker.
3. Slowly pour the methanol into the beaker containing the Ardrox concentrate while stirring the solution.
4. Label the container “Ardrox Working Solution”. Include the date of preparation on the label.

Application of Ardrox

Ardrox does not perform well on highly fluorescent backgrounds, and it may be absorbed into some substrates causing them to become highly fluorescent. Test an area of the substrate free of developed prints before attempting to enhance developed prints. If the test area fluoresces after being thoroughly rinsed and dried, do not use Ardrox to enhance the prints.

Immersion Method:

1. Submerge each item in the working solution for approximately one minute.
2. Allow excess working solution on the items to drain back into the working solution tray.

Spray Method:

1. Suspend each item to be processed in a vented or ductless spray chamber.
2. Hold the spray container nine to twelve inches from the surface of each item and spray the entire surface with smooth, side-to-side and top-to-bottom strokes.
3. Catch liquid runoff with a suitably sized tray.

Brush Method:

Using a soft bristle brush such as the SIRCHIE 118L or LHB02, paint the item repeatedly with working solution.

SPECIAL NOTES

After applying Ardrox and allowing at least one minute for the dye to set, rinse each item thoroughly under running water. Air-dry each item completely. Keep unused solution in a tightly sealed container. If you purchased the pre-mixed solution in a spray bottle, remove the spray attachment, clean and replace the cap that was supplied with the bottle.

When fuming with cyanoacrylate it is strongly recommended that you underdevelop latent prints rather than overdeveloping them. This is especially true when you intend to enhance the prints with Ardrox. Excess residue from over-development tends to fill the valleys between the ridges causing dye staining to be ineffective.

VISUALIZATION

Ardrox is a fluorescent reagent, and appropriate equipment is required to view the developed print. Ardrox has a broad excitation band stretching from shortwave UV well into the blue range. Excitation can be accomplished with shortwave or longwave UV light sources, BLUEMAXX™ or other alternate light sources. Follow all safety recommendations for the light source you choose. If using a light source other than longwave UV, viewing must be through an appropriate barrier filter such as the filter supplied with the BLUEMAXX™. Darken the room for best viewing.

RECORDING THE EVIDENCE

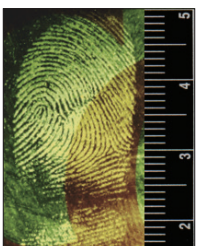
Video and film cameras may not exhibit spectral sensitivity identical to the human eye. Put another way, what you see you may not get. As a consequence, it is difficult to develop hard and fast rules for the use of these instruments in recording fluorescence. It is possible, however, to develop general rules for fluorescence photography.

USE OF LIGHT METERS—Unless you are fortunate enough to have a highly specialized spot meter, you will find that normal hand-held or in-camera light meters are of no use in fluorescence photography. Do not rely on the camera's automatic mode, or upon recommendations that its light meter may offer.

Use bracketing techniques, and expect exposure times of a half-minute or longer.

STEADY THE CAMERA—Because of the extremely low light levels involved with fluorescence, photography involves long exposures. Photography must be done with the camera mounted on a sturdy tripod, and the room should be totally dark or you must use a light-tight enclosure.

ILLUMINATION TECHNIQUES—The only illumination present must be from a BLUEMAXX™ light or suitable UV light. Stray light must be eliminated and illumination must be as even as possible. Good practice suggests that you "paint" the light onto the surface being photographed by moving the illumination spot around during exposure. This will tend to even out the illumination over the period of the exposure.



Fill the frame and use a scale.

FILL THE FRAME—Fluorescence intensity falls off with distance so it is important to position the camera as close to the subject as possible while filling the viewfinder frame with the image. If you use a commercial lab for film processing, allow a 20% border around the subject to allow for their cropping of the photos. If you are using a 35mm camera, specify 4" x 6" prints.

USE A BARRIER FILTER on the camera is necessary for the same reason you needed one for your eyes. If you are using standard UV light sources, equip the camera with a UV17 or Haze 2A filter.

Although it is possible to photograph through the barrier filters supplied with BLUEMAXX™ lights, we recommend filters specifically designed for use with your camera. Please note that some commercially available filters may fluoresce weakly themselves when exposed to the BLUEMAXX™ beam. This will result in hazy or foggy photos. Specify non-fluorescing threaded filters or Cokin®-type sheet barrier filters available from your local camera distributor.

FILMS—All films are sensitive to blue light. If a barrier filter were not used, the blue light would overpower the fluorescence and mask it. In this application Daylight films are superior to specialty films such

as tungsten or similar light compensated films. Daylight films generally have red, green, and blue layers of equal sensitivity. Tungsten films are manufactured to be especially sensitive to blue, and are not suitable for UV photography.

Use the highest speed film you can find. Reduce the effect of graininess by filling the frame, thus reducing the enlargement factor. Use a large format camera for the same reason.

Black and white films are excellent for recording fluorescence due to their high speed and relatively fine grain. A barrier filter is still necessary with black and white film.

APERTURE SETTING controls the size of the opening in the lens iris and thus controls the amount of light reaching the film. Because fluorescence is weak you may be tempted to open the aperture as wide as possible to reduce exposure times. But keep in mind that the aperture also controls depth of field or depth of focus. Use of a small aperture means sharpest focus over an extended object. Focus is especially critical when photographing at close range. We recommend using longer exposures and smaller apertures (f/8 to f/22).

RECIPROCITY FAILURE—If you experiment with the relationship between the amount of light present from a scene, the length of time that the camera shutter is open, and the density of the exposure created on film, you will find that for normal photography a simple relationship exists: *exposure=light intensity x time.* When exposures are long or light intensities are either very low or very high, this relationship fails to hold together. This is known as reciprocity failure. The consequences of this in fluorescence photography are seen in color shifts and in a general decrease in film speed. Color shifts can be compensated for with color-compensating filters if you feel it is necessary. (Consult photography texts for assistance.) You will also find that camera settings no longer scale in a linear fashion (i.e., doubling the aperture size or exposure time does not double the density of the exposure). What all of this leads up to is that fluorescence photography is an art.

KEEPING RECORDS—Successful fluorescence photography requires practice, experience, and pa-

tience. As you gain experience your judgment of exposure times will certainly improve. The learning curve can be greatly reduced if you record your experiences in a notebook. The data worth recording includes the subject being photographed, aperture settings, film used, and exposure times. Be sure to include a copy of the resultant photograph.

STARTING POINT—The following table was developed to provide a starting point for your photographic efforts:

SETUP	SUBJECT	APERTURE	EXPOSURE TIME
Film Speed: *ASA/ISO 400*	*Ardrox*	*f/16*	*8 sec*
Process Time: *60 sec @ 70°F*	*"*	*f/22*	*40 sec*
Distance to Target: *8"*	*"*	*f/32*	*60 sec*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