

BLUESTAR[®] FORENSIC

Latent bloodstain reagent

BLUESTAR[®] FORENSIC TABLETS

Ref. BL-FOR-TABB

A - Technical Application Note

The BLUESTAR[®] FORENSIC is a patented powerful new latent bloodstain reagent that has been designed to reveal blood, either fresh, dried or still humid, washed away blood, pure or diluted, in large or minute quantity.

The use of chemicals to investigate crime scenes is well known, and latent blood reagents such as Amido Black, Benzidine, Leucomalachite, Leuco Crystal Violet, Fluorescein, Luminol, Phenolphthalein, Herma-Glow, etc. have been applied for many years by forensic experts around the world to detect blood in minute quantity; blood cells still present in washed-away bloodstains; or blood otherwise invisible to the human eye.

Two main categories of such chemicals exist for this purpose:

- Those which react to the proteins and amino acids contained in the biological fluid: DFO, Amido Black, etc.

- Those which detect an enzymatic activity: Benzidine, Leucomalachite green, Leucocrystal violet, Luminol, Fluorescein, etc.

However, all these existing chemicals suffer from some major drawbacks.

Some are simply too toxic or too highly flammable to be used safely.

Others severely compromise or prevent DNA typing, are not sensitive enough, and are difficult to use. Still others are highly unstable, have a very short life, are difficult to maintain in storage, or any combination of the above...

To solve these problems, Professor Loic Blum, Ph.D., a recognized authority in chemiluminescence, and the research team of the Enzymatic and Biomolecular Engineering Laboratory of the French National Center for Scientific Research (CNRS) at the University Claude Bernard of Lyon UCBL, France, developed the new latent bloodstain reagent BLUESTAR[®] FORENSIC.

When placed in contact with the iron contained in the heme nucleus of blood hemoglobin, the BLUESTAR[®] FORENSIC catalyzes (enzymatic peroxidase activity) and emits an intense blue (430 nanometer) chemiluminescence, visible in the dark.

The BLUESTAR[®] FORENSIC can also produce a chemiluminescence when reacting to some household detergents such as bleach, or copper; but differences in intensity, emission spectrum, and reaction time, allow for visual differentiation by experienced users.

The BLUESTAR[®] FORENSIC latent bloodstain reagent is based on a new proprietary patented formula that is totally DNA typing compatible, stable, easy to use, and produces a very bright and long lasting chemiluminescence.

The BLUESTAR[®] FORENSIC latent bloodstain reagent is extremely sensitive. Blood is detected on any background: material, animal or vegetable, in liquid or solid form. Blood may be detected either pure or diluted, while fresh, or long after it has been deposited (dried or even deteriorated).

Furthermore, it allows for viewing the blood traces even if they have been rinsed away, or cleaned away (even on minute blood amounts).

The BLUESTAR[®] FORENSIC latent bloodstain reagent produces such an exceptionally bright chemiluminescence that complete darkness is not required for use, and no special photographic equipment is necessary to record the evidence. Standard 35 mm cameras can be used with perfect results.

The BLUESTAR[®] FORENSIC latent bloodstain reagent is prepared within minutes. It is then applied lightly, in a mist, with a hand-held fine-spray bottle.

The blue chemiluminescence produced by the BLUESTAR[®] FORENSIC latent bloodstain reagent is still visible several minutes after the bloodstains have been treated.

To facilitate crime scene investigation, BLUESTAR[®] FORENSIC can be applied numerous times over the same bloodstains without compromising later-DNA typing.

B - User's Manual

I - MIXING INSTRUCTIONS

Box content

Each BLUESTAR[®] FORENSIC TABLETS box holds 2 tubes containing 8 pairs of tablets to make 8 x 125 ml (8 x 4 fl. oz) of BLUESTAR[®] FORENSIC chemiluminescent solution or 1 liter (32 fl. oz) if all pairs are used together.

Required items

Prior to mixing the product, you will need the following items:

- distilled water
- spray bottle (mister) equipped with an adjustable spray nozzle

Active life

Best results are obtained when the product is used within 3 hours after mixing the tablets in water. There is therefore no requirement to rush the investigation due to immediate product deterioration.

Covered area

A 125 ml (4 fl. oz) dose is generally sufficient to investigate a 25 m² (250 sq. ft.) area, to search a vehicle or an object (clothes, rug, knife, etc.). A 1 liter (32 fl. oz) dose is generally sufficient to investigate about a 200 m² (2,000 sq. ft.) area.

Mixing procedure

1. Open the spray bottle; add 125 ml (4 fl. oz) of distilled water.
2. Take a white tablet out of the white-top tube and close the tube immediately. Take a beige tablet out of the orange-top tube and close the tube immediately. DO NOT switch caps. The white cap goes on the white-top tube and the orange cap on the orange-top tube.
3. Add the pair of tablets to the distilled water. If you need more working solution, use 125 ml (4 fl. oz) per pair of tablets.
4. Twist the head with its plunger onto the spray bottle firmly.
5. Allow about 1 or 2 minutes for complete dissolution and mixing of the chemicals, swirling gently with a circular motion of your hand. Do NOT shake the container upside down.

2 - APPLICATION INSTRUCTIONS

Lighting conditions

The BLUESTAR[®] FORENSIC latent bloodstain reagent produces a very bright and long lasting blue chemiluminescence that does not require total obscurity to be visible. However, at high blood dilutions, the investigation will be much easier, and the risks of missing a clue much lower, if the product is applied in total darkness.

Indoors: Close all the windows, block all outside light sources, and turn off all the lights.

Outdoors: Wait for night time, and turn off all area lights

in an urban environment. If necessary, screen off distant light sources, or even a very bright moon, and work facing away from parasite lights.

Wait for at least 1 minute to allow your eyes to adjust to darkness. Once your pupils have dilated, you will be able to better observe the BLUESTAR® FORENSIC reaction.

Vaporization

In order to prevent biological contaminations of the revealed bloodstains, wear personal protective equipment: safety goggles, gloves, dust respirator, protective clothing. Do not spray toward another person.

The BLUESTAR® FORENSIC latent bloodstain reagent is designed to be vaporized from waist height in a fine mist. Adjust the spray nozzle to obtain the finest mist possible. Very little of it is actually needed. Over-spraying does NOT result in improved blood detection, and in case the DNA is only available in very low quantities, over-spraying might dilute it too much for collecting exploitable samples, thus compromising its analysis.

Check how the product reacts by spraying BLUESTAR® FORENSIC on a testing sample. This test will also help you become familiar with the reaction on blood.

Spray lightly, horizontally ahead of you, at least 50 cm (2') away from the target, in a side to side sweeping motion, NOT pointing toward the ground.

Indoors: Be attentive not to saturate walls and vertical surfaces in order not to create drippings (as if you were spray painting).

Outdoors: Pay attention to wind direction, if any. Do not spray into the wind, but use it to carry a light cloud of product over the area being searched.

Identifying "false" reactions

When reacting to blood, the BLUESTAR® FORENSIC latent bloodstain reagent emits an intense light-blue chemiluminescence in the 420 to 440 nanometer range. However, "false" reactions may occur due to the presence of certain household detergents, chlorine, some paints and varnishes, copper, certain iron metabolizing plants such as lichens, thyme and some tree mosses, and certain soils containing iron.

Such "false" reactions are easily identifiable by the trained technician because their color, brightness, and duration differ from those of the typical reaction on blood. Typically, "false" reactions are markedly dimmer and whiter.

"False" reactions due to chlorinated detergents are often interesting, because they may reveal attempts to wash or clean bloodstains, and to conceal a homicide.

3 - PHOTOGRAPHY

Photography of latent blood prints developed with chemiluminescence is not fundamentally different from regular daylight photography. The same four basic elements of photography (subject lighting, film sensitivity, aperture opening, and shutter speed) interact in exactly the same way.

Photography of BLUESTAR® FORENSIC detected blood prints is easy and produces excellent results.

Equipment

The chemiluminescence produced by the reaction of the BLUESTAR® FORENSIC latent bloodstain reagent to blood is bright enough that no special equipment is needed. However, relatively long exposures may be needed for maximum picture quality and a tripod and flexible cable release are highly recommended. This will ensure the camera is motionless during the time of the exposure. A 24 mm lens is recommended.

Film

No special film is required, but it is advisable to use low-light fast films in order to obtain acceptably short exposure times. A film speed of ASA 400 is generally suitable.

Lighting conditions

Total darkness is not required. Natural low intensity diffused light is preferred. Artificial light (tungsten or fluorescent) produces yellowish or greenish pictures. A direct flash should be avoided.

Instructions to obtain good pictures

1. Set the camera on a tripod, perpendicular to the area being photographed.
2. Disable the automatic flash and the autofocus mode, if the camera has one.
3. Use a large lens aperture, typically a $f/2.8$ "f/stop" value.
4. Set the exposure time to "B".
5. Focus the lens manually over a spot of light provided by a flashlight over the blood area.
6. Turn off all lights. Darkness should not be complete. Pictures shot in dimmed light will allow you to view not only the trace, but other details of the scene as well.
7. Re-spray the blood print to reactivate a bright chemiluminescence reaction.
8. Shoot several pictures using different shutter speeds, typically 30 seconds.

4 - COLLECTING BIOLOGICAL PRINTS

Samples of the revealed biological prints for subsequent DNA analysis are collected using the same methods as for any kind of biological prints.

5 - STORAGE, CLEANING & DISPOSAL

Storage

The BLUESTAR® FORENSIC TABLETS latent bloodstain reagent has a 3 year shelf life AFTER MANUFACTURING (expiration date imprinted on each cardboard box).

Be certain to close the tubes immediately with their respective caps after each opening. If you wish to use the product after the expiration date, we recommend that you perform a test to check the product effectiveness.

Note: The product is warranted for 2 years after the DATE OF PURCHASE.

DO NOT attempt to store the product AFTER MIXING the tablets with water. The mixed product is an active chemical compound that oxidizes. Inert gases are constantly released and will, in time, accumulate under pressure in a sealed container, causing swelling and leaking.

Cleaning

Since the BLUESTAR® FORENSIC latent bloodstain reagent is designed to be used on presumed blood on crime scenes, all precautions and regulations related to the biohazards of blood apply when cleaning.

Disposal

Dispose of unused mix in a sink under running water. Dispose of cleaning residues according to local, state, and federal regulations applying to the biohazards of blood.

6 - MATERIAL SAFETY DATA SHEETS

Material safety data sheets (MSDS) for the BLUESTAR® FORENSIC tablets and working solution are available in PDF format on our web site:

www.bluestar-forensic.com/gb/download.php

BLUESTAR

16 Avenue de la Costa - P.O. box 246
Monte Carlo - 98000 MONACO
Tel. (+377) 97 97 31 77 - Fax (+377) 97 97 31 61

E-mail: info@bluestar-forensic.com
www.bluestar-forensic.com

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