

TENNESSEE BUREAU OF INVESTIGATION
Forensic Services Division

Violent Crime Response Team Standard Operating Procedures
BLUESTAR



10. VCRT Procedures

10.5 BLUESTAR®

10.5.1 Scope

BLUESTAR® is a presumptive test designed to reveal fresh, dried or cleaned blood, neat or diluted, in trace or sizeable amounts. This test operates by chemiluminescence. When BLUESTAR® FORENSIC latent bloodstain reagent comes into contact with the iron contained in the heme nucleus of hemoglobin found in blood, it is catalyzed by peroxidase activity and emits a light blue glow.

It is of most use at crime scenes which have been suspected of being cleaned to hide or destroy evidence.

Principle:

In this test procedure, a suspected bloodstain is lightly misted with a hand-held fine-spray bottle containing BLUESTAR® FORENSIC latent bloodstain reagent. If the iron found in heme (a constituent of hemoglobin found in blood) is present, the BLUESTAR® FORENSIC latent bloodstain reagent is catalyzed by its peroxidase activity. The chemical luminol, a component of BLUESTAR®, is oxidized by hydrogen peroxide, to produce a molecule in an excited state. When the excited electrons in the molecules fall back to their ground states, light is given out. Therefore, if blood is present, an intense light-blue glow will appear when misted with BLUESTAR® FORENSIC latent bloodstain reagent.

10.5.2 Definitions

Refer to VCRT 11.0 Definitions and Abbreviations

10.5.3 Chemicals and Reagents

BLUESTAR® FORENSIC tablets, (Product #1408 (MED Tech Forensics)
Distilled water

10.5.4 Equipment and Supplies

Spray bottle (mister)
Known blood control
Material to darken room

10.5.5 Test Procedure

Preparation of Reagent

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1. Open the spray bottle and add 125ml of distilled water.
2. Take a white tablet from the white-top tube and close the tube immediately.
3. Take a beige tablet from the orange-top tube and close the tube immediately. Do not switch the caps of the tubes.
4. Add the pair of tablets to the distilled water.
5. Twist the head with its plunger onto the spray bottle firmly.
6. Allow 1 or 2 minutes for the complete dissolution and mixing of the chemicals, swirling gently with your hand in a circular motion.
NOTE: Do not shake the container upside down.
7. Check the reagent with a positive and negative control. A known blood sample can be used as the positive control.
8. The reagent works best within 3 hours of mixing the tablets in water. The reagent can be used past 3 hours if checked against controls.
9. Document the results of the control in the notes.

Method

1. Create optimum lighting conditions:
Indoors: Close all the windows and block out outside light sources. Turn off all lights.
Outdoors: Wait for night time and turn off all area lights. Screen off distant light sources and work facing away from problematic lights.
2. Spray lightly, horizontally ahead, at least 2 feet away from the target in a side to side sweeping motion.
NOTE: Do not saturate vertical surfaces; be aware of wind direction.
3. Document observations in the notes.

10.5.6 Results and Conclusions

1. Positive. If an intense light-blue chemiluminescence is emitted, the result is positive and indicates the possibility of the presence of blood. A positive Bluestar reaction should be followed by TMB & P testing before reporting an indication of blood.
2. Negative. If there is no chemiluminescence present, the result is negative and indicates an absence of blood.
3. False positive. "False" reactions can be seen with various materials including cleaners and bleach.

NOTE: Photographs of Bluestar-positive areas can be obtained using the *Krimesite Imager* in conjunction with the Bluestar procedure. Using the *Krimesite Imager* and the "blood filter", observe the treated area for increased fluorescence. Photograph as needed.

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10.5.7 Reporting

Record the results of the BLUESTAR® application in the notes, along with the results of the control testing.