

STEAM THERMOGRAPHY

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Bloodstains are one of the most crucial forms of evidence in a forensic examination. Examining the pattern and quantity of blood found at a crime scene could provide details on the nature of the crime. Its in-depth analysis can reveal absolute pieces of information such as the identification of a victim or the culprit responsible for the crime, the nature of the injury, the weapon used to inflict the injury, etc.

When entering a scene of the crime, the investigating officer must be able to detect and record their findings by means of sketching, video, and photographing evidence. For evidence pertaining to bloodstains, the application of luminol and other blood detection techniques can be employed. Luminol is a widely used chemical for the detection of blood stains at a scene of crime. It basically reacts with the iron components of the blood and fluoresces when viewed in the dark. Apart from the dramatic flair it provides, it is accompanied by a few setbacks. The technique improvised to counter the setbacks of luminol tests is ‘Steam Thermography’.

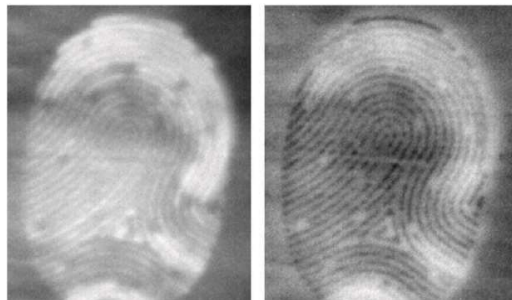


Fig 1. Fingerprints developed using steam thermography

Developed by a team led by chemistry professors Michael Myrick and Stephen Morgan from the University of South Carolina, it is a technique that enhances the chemical contrast in thermographic images by exposing the said questioned surface containing blood to water vapour i.e., steam during imaging. This exposure generates heat, aiding the increase of the thermographic ally-measured temperature of the imaged surfaces. This can result in thermographic contrast between surfaces with different chemical properties. For blood stains, the enhancement capacity is measured by the radiant heat transfer which warms up the blood and its backdrop.

REQUIREMENTS:

The use of a portable steamer is advised along with the heat imaging IR-sensitive cameras. The thermal images are recorded through a sodium chloride salt window by a FLIR Systems A315 microbolometer-based camera (16-bit digitization, 240 x 320-pixel resolution, 30 Hz frame rate) which helps in the detection of even minute amounts of blood.

REFERENCES:

- Belliveau III, R. (2019). Studies on the Mechanism and Application of Steam Thermography. Theses and Dissertations. <https://scholarcommons.sc.edu/etd/5549>
- [Fig 1] Forensic Investigations Using Thermography and Steam. www.flir.in. Retrieved February 9, 2023, from <https://www.flir.in/discover/rd-science/forensic-investigations-using-thermography-and-steam/>