

The Use of KODAK High Speed Infrared Film for Photography of Possible Gunshot Residue and Powder Patterns

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The ballistics investigator in a firearms case is often called to give testimony on probable distance from target. The smoke and powder residue that can be seen during a visual inspection of the evidence can help the investigator give this testimony. Generally the evidence is clothing or fabric. On most light-colored clothing, there are usually no problems because the patterns can be seen visually; but when dark-colored clothing is the evidence, visual inspection is almost impossible. The following technique, using KODAK High Speed Infrared Film, may help the investigator in his examination.

This technique will require the following:

1. Enough KODAK High Speed Infrared Film to shoot eight or more exposures for each general area of examination.
2. One KODAK WRATTEN Filter No. 88A or No. 87.
3. One KODAK WRATTEN Filter No. 87C.
4. KODAK Developer for the film (HC110, D-76 or D-19).
5. Hand-held or other light meter.
6. Neutral or Grey Test Card (18% Gray).
7. Ruler or scale.
8. Two light sources that contain a high amount of I.R. (Tungsten bulbs or daylight is best, but electronic flash may be used with varying degrees of success.)

The Technique

1. Tripod- or Copystand-mount the camera loaded with Infrared Film. Observe the special handling requirements of this film contained in the data sheet.
2. Place the evidence in front of the camera so that the area in question containing the ruler will be photographed.
3. Focus on the area in question and shift the focus to the I.R. focus mark on the lens. Lacking this mark, shift the focus forward 1/4 of 1% of the focal length of the lens.
4. Set the ASA setting on the light meter according to the filter and light source that will be used. This information may be found in the film data sheet.
5. Set the lighting for normal flat copy lighting (45° equal distance from evidence).
6. Carefully, so that the evidence is not disturbed, place the gray card in the subject area and meter the light. Then remove the gray card.
7. Using camera settings from the prior light reading, place the appropriate filter in front of the lens. Make a bracket exposure set of one stop under, right on, one stop over, and two stops overexposure. It is suggested that a high f/# (small opening) be used. The bracket is to compensate for any absorbency of the subject.
8. Repeat steps 2-7 for the other filters to be used.
9. Develop the film for higher contrast in accordance with time and temperature found in the data sheet on the film. No safelights may be used with this film.

This method can enable the investigator to observe patterns not normally seen by the naked eye. It may be, though, that nothing will be observed other than the evidence itself. This could be from a lack of reflectivity in the subject or from too great a distance of the weapon from target. The possibility also exists that the powder in the cartridge did not leave sufficient residue on the evidence to be recorded by this method. In addition, the possibilities of tight chambering and deflection of the powder/gas pattern may have to be considered.