

Ultraviolet Photography with Film-Based Cameras

Dr. Austin Richards

info@uvcorder.com

Because digital ultraviolet imaging systems are generally more expensive than film-based UV camera systems, it is worth discussing the difficulties that the traditional film-based UV photographer faces.

Ultraviolet imaging in the near-UV band has traditionally been done with standard black and white film cameras equipped with a filter that passes near-UV light while rejecting visible light. The Wratten 18A filter has been a staple of UV photography for decades, but is no longer manufactured. Suitable replacements include filters made with Hoya U-360 and Schott UG-11 glasses. These glasses have a black appearance to the eye, since nearly all visible light is absorbed. These filters are unfortunately called UV filters, but really they are visible light filters! They let the UV through and block visible light. This is the opposite of the traditional UV haze filter, often denoted by the number 2A, which *blocks* UV, but passes visible light!

Standard camera lenses can be used for UV imaging in the near-UV band (340-400nm), although their transmission rolls off below about 330nm. For shorter wavelengths of UV, the standard practice is to use a special lens made of UV-transmitting materials such as quartz and calcium fluoride. These lenses are very expensive and come in a limited range of focal lengths and f/numbers.

The disadvantages of UV photography using film are many, and the situation is getting worse with time, because some UV photographic equipment for film cameras is no longer being produced. Apparently, many manufacturers of photographic equipment have decided that there is little opportunity to make money on low-volume items like UV pass filters, quartz lenses and special UV film.

Why is it hard to use a camera to record a UV image? For starters, one cannot compose the shot with a UV pass filter installed on the lens of an SLR camera, because the filter is opaque to visible light. This makes it very difficult to take candid images in the UV band. A tripod is an absolute requirement, since the exposures with standard films like T-Max 400 tend to be quite long. In addition, the focus setting will be different for the UV image, unless one is using a quartz lens like the very expensive Nikon UV-Nikkor (no longer produced) that has the same focus point for both green and near-UV light. In practice, the UV film photographer ends up shooting with the aperture stopped way down to increase the depth of field. This can obviate the focus problem, but makes for even longer exposure times. Conventional light meters on modern SLR cameras aren't calibrated for UV work, so getting the right exposure almost always requires bracketing to achieve the correct exposure density.

To summarize the UV film experience, you put the camera on the tripod, compose the shot with the UV pass filter removed, focus in the visible, stop the lens down to f/11 or thereabouts, put the filter on, bracket the exposure using a cable release since you generally have several second long exposures, develop the film and throw away 80% of your images that are either too light or too dark. To add to the pain and suffering, black and white film is no longer sold in drugstores and supermarkets, and your standard 1 hour photolab won't process it. Color film can be used for UV photography, but it is less sensitive than high-speed B/W film leading to still longer exposures and a lot of trial and error.