First Exposure

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Kodak EIR show with #12 yellow filter.

EIR shot with #12 filter, scanned and reversed in Photoshop.

EIR shot with #12 filter, scanned, reversed and color-corrected in Photoshop.

Kodak Ektachrome Professional Infrared EIR Film

If there is any film that truly defines the difference between the "art" and the "science" of photography, it has to be Kodak's Ektachrome Infrared IE. This film became popular for scientific documentation and for those who wanted to capture unique color variations of the norm on transparency film. This film was processed in E-4 chemistry, and Kodak continued to manufacture it although they switched other Ektachromes to the E-6 process. After considerable prodding from photographers, Kodak finally decided to upgrade to Ektachrome Infrared EIR film, an E-6-process film. This pleased many large format photographers who used infrared film for aerial, commercial and scientific studies. To satisfy the 35mm users, Kodak now cuts the large manufactured rolls down to a 35mm perforated version called Ektachrome Professional Infrared EIR film. This is the first positive infrared film that can be processed in either E-6 or AR-5 processes. *[Note: AR-5 is an Eastman Kodak process intermediary between E-4 and E-6 that produces less contrast than E-6 and is primarily designed for aerial photographers—we think the "AR" actually stands for Aerial Reconnaissance, although no one will confirm that. AR-5 cheimstry is still sold by Kodak, but the company no longer offers the process as a service; see below—Ed.]*

Using EIR

This is not a simple film which you merely pop into your camera and start shooting. A basic understanding of how EIR works—special handling, filtration,

Normal, non-infrared color slide.

Kodak EIR normal process, E-6.

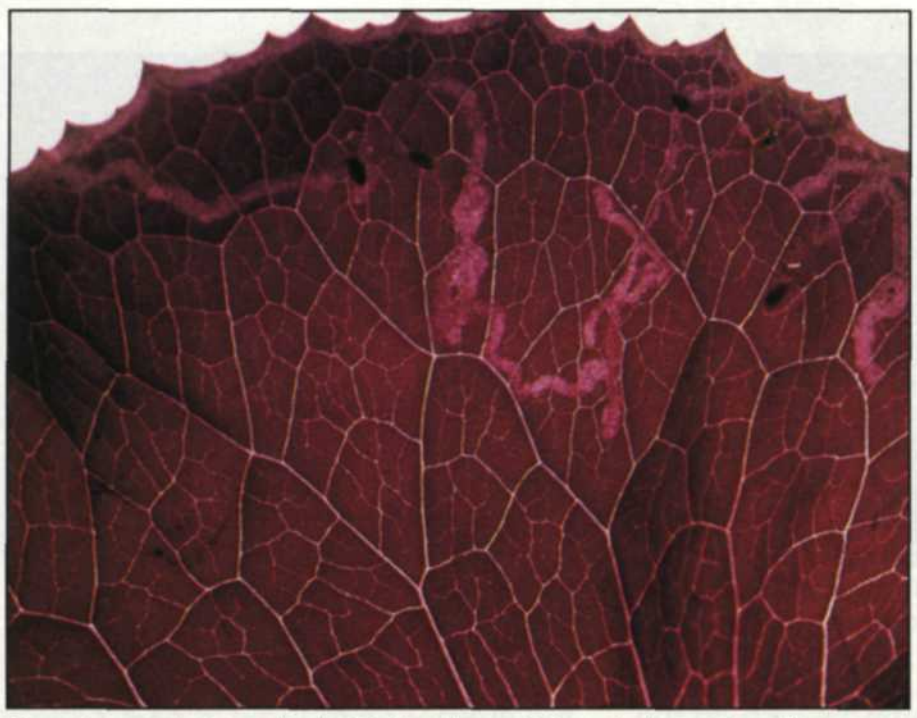
Kodak EIR pull-processed 1 stop, process E-6.

Kodak EIR shot with no filter and processed in C-41.

Kodak EIR shot with no filter, reversed and color-corrected in Photoshop.

exposure and processing—is first required. Kodak Ektachrome Infrared EIR is a "false color" film; in other words, the colors you actually see are not recorded as such on the film. The technical workings of the film are very complex, so here's the short version. (If you want the long version, there is the full 16-page technical document, which you can find by running a search on the internet for "Infrared EIR film".)

First, you will need to use a Kodak Wratten #12 filter or its equivalent. If you do not, the blue light striking the film will decrease the infrared effect considerably. When the blue light passes through this filter, it becomes black on the film. Red is reproduced as green, and green is reproduced as blue. Objects reflecting infrared will be reproduced as red. The reason for these false colors is so that the scientific and commercial photographers using this film can analyze diseased plants, monitor water pollution, investigate inks and pigments in paintings, and record staining applications in photomicroscopy.



Green leaves photographed with Ektachrome Infrared; shot with no filter.

EIR Shot with #12 yellow filter.

Artistic photographers can use the film for bizarre pictorial effects with different filtration, exposure and processing. Most scenics taken with this film and a yellow filter result in a green sky and a purple or red color for green foliage. Other colored objects will be recorded in mixed proportions of green and blue. The variations are often bizarre, but limitless!

The handling and loading of this film also requires special precautions. Kodak recommends loading and unloading the film in total darkness to prevent any fogging. This is undoubtedly the best way to use the film, however, on occasion, I've loaded and unloaded the film under subdued light with no fogging. Loading in sunlight for just a few seconds did fog the first half dozen frames. This film is more sensitive to variations in temperature and humidity than conventional film. Keep unexposed film in the refrigerator or freezer, and once exposed, process the film quickly to avoid changes to the latent image.

Differences in Processing

Your camera's exposure meter will not correctly meter the infrared portion of the spectrum, and must only be used as a guide. Since the exposure latitude of this film is only +/– ½ stop, you should use a multi-step bracket function at ⅓-stop intervals. After you have shot a few rolls, you will get better at guessing how much infrared is in a scene. Be prepared to have a very small percentage of good exposures on your first few tries.

EIR Infrared Film can be processed in either the AR-5 or E-6 process, as mentioned. The AR-5 process produces a lower film speed, around E.I. 100, while film developed in the E-6 process should be rated at E.I. 200 in daylight or with electronic flash. The AR-5 process has lower contrast, less saturation, and a wider exposure latitude. This process is recommended for the photographer using the film for highly technical applications, where the color response is highly critical for data interpretation. There are a few third-party labs that still offer the AR-5 process and are listed at the end of this article.

If you decide to process this film in the standard E-6 process, I would highly recommend using a professional photo lab for several reasons. Because of the

AR-5 Specialty Processing Labs

Rocky Mountain Film Laboratory
60 Geneva St.
Aurora, CO 80010
(303)-364-6444
E-6, AR-5 and cross process to negative

Precision Photo Laboratories, Inc.
5758 North Webster St.
Dayton, OH 45414
(937) 898-7450
E-6, AR-5 and cross process to negative

HAS Images, Inc.
136 North St. Clair Street, Ste. 300
Dayton, OH 45402
(937) 222-3856
E-6, AR-5

infrared response of the film, the processing lab cannot use any type of safelight device, or have any device in the processing room that would fog the infrared layer. This includes all LED displays, sensors and temperature probes. Before you send any film to a lab, make sure that you advise them of the processing restrictions of this film. The film can be pushed one stop, but correct exposure gets even harder to achieve as exposure latitude becomes even less than +/– ½ stop. You should also let the lab know that this film is on a very thin (4 mil) Estar base and may be difficult to cut with some slide mounters as it may crinkle in the mounter. (Ouch!) Be sure to tell the lab, as your EIR may need to be hand mounted.

Cross Processing

With all these variables that make using this film difficult, you might get discouraged with the whole process. Well, there is an infrared light at the end of the tunnel, so to speak, and it's called C-41! This method of cross processing EIR is *not* listed in any of the Kodak information sheets, but it greatly improves your chances of getting good images. Many years ago, when I shot the older E-4 process infrared film, I accidentally processed a roll in the C-22 process. The image looked great but was reversed. I added a color negative mask and printed the images on standard color paper, and got some great results. When the new EIR film came out, I naturally assumed that it too would process in C-41. It worked great, and my final film speed ended up being E.I. 320. After only one roll in C-41, my shooting percentage went from less than 20% to 100%, so I no longer had to bracket any of the exposures.

I scanned the reversed images into Photoshop and used the invert function (under the Image menu) to get my positive image. They looked like the normally processed E-6 infrared images, except that the contrast and saturation were lower. Using Photoshop's color balance function, I was also able to change the green sky back to blue and still keep the other infrared characteristics of the image. The only drawback is that the C-41 process makes the film very fragile during the wet-to-dry process. Special care needs to be taken when working with the wet film, but when dry, it is as hardy as the E-6-processed version.

If you want to use the film for scientific or commercial applications, I would recommend running a variety of exposure and processing tests before relying on the data. For the artistic photographer, experiment in order to create that unique color image. Try different filters, lighting conditions, man-made vs. natural subjects, and even vary the processing. Whatever the reason you use Ektachrome Infrared EIR, I'm sure you will have a whole new outlook on the color spectrum.

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