

ROLLEI infrared: The joy of infrared

The new ROLLEI infrared film is groundbreaking. Unlike other infrared films, it does not need to be loaded or unloaded in absolute darkness. Moreover, the film can be used without classic IR filters, just like a standard panchromatic film.



A ROLLEIFLEX 2.8 F with an original ROLLEI IR Filter mounted.



The picture was taken with a NIKON F3HP and a Nikon AIS lens f/2.8/28mm. When using the black filter (Heliopan RG 715), only well-lit objects are visible through the SLR finder. In addition, we sometimes preferred to use a tripod with a mirror up solution and with cable release or self-timer. For longer exposure times we used a GITZO tripod, model G1155T with a ball head. Its five segments can be extended to 146 cm, with closed measures of only 36 cm. They are made of carbon fibre, so total weight is just 1,000 grams.

In the January edition of TuttiFotografi, we had our first encounter with this film, with the brand new ROLLEI-infrared-emulsion. Back then, we discovered its user-friendliness. The warm season approaching and photosynthesis in the leaves being in progress, we decided to test the film and its various applications once again.

The ROLLEI infrared film has two main features: Although it is a highly effective infrared film, it can be handled in dim light. The camera does not have to be reloaded in absolute darkness, which is a must for ordinary infrared films. The benefit is obvious: You do not need your changing bag anymore and, even more important, infrared photography with panorama and different medium format

cameras is now possible without the usual loading problems.

The second great progress compared to ordinary infrared films is its usability as a standard panchromatic film (ISO 200), without classic black IR filters. That means, infrared and normal black & white exposures are possible with the same film. There are special requirements regarding object and weather conditions that have to be met for efficient infrared photography.

Thus, the now possible change between infrared and standard panchromatic snapshots using the same film means a great deal of flexibility working with this film.

Test report „fotografi“ 2006
Topical tips and tricks,
dealing with the
ROLLEI INFRARED
film.





Notice the effects different lighting has on the vegetation on an infrared exposure: The wisteria in the foreground has parts illuminated by the sun as well as parts in the shadow. Both have become brighter, whereas the palm tree on the right and the cypresses on the left of the picture have hardly changed. The performance of infrared photography is highly dependent on the type of vegetation and the infrared radiation as well as the weather conditions, the time of day and the season. Villa Hambury in Ventimiglia (Italy), Nikon F3HP, 28mm wide-angle lens f/11, 1/30 sec. Free hand.

THE INFRARED EFFECT

Infrared radiation is neither visible to the naked eye, nor does it appear on a standard panchromatic film. It is limited to a light spectrum of 700 to 900 nm and above.

Infrared exposures belong to the field of scientific applications but in B & W photography it broadens the creative horizon. Special effects can be produced, e.g. by using filters: a black sky, strongly visible clouds and removal of haze and flatness, which often appears in landscape images and is caused by atmospheric dust.

Furthermore, IR photography modifies the balance of sound and provides impressive effects: Leaves and vegetation in general are reproduced in bright tones, water is totally black. Depending on the film and filter material applied, highly illuminated areas might appear in diffuse light (Aura-Effect). This would normally require using films without an anti-halo-layer and overexposing of two f-stops, again depending on the intensity of infrared radiation and on the reflection of the object.

CAMERA LOADING IN DIM LIGHT CONDITIONS

The ROLLEI IR 820/400 is a super-panchromatic film with higher light sensitivity than standard panchromatic films. Thus, it does not need to be loaded in absolute darkness, but cannot be exposed to bright sunlight either. Being inquisitive, we tried to load our camera in bright desert sunlight nevertheless. With the result that the first part of the film, up to number zero, was exposed with haze but the rest did not have any failure whatsoever. We therefore recommend to load or unload cameras in the shade of one's body or in any sun-protected area.

Furthermore, we carried a couple of MACO/ROLLEI 135-36 films with us in our photo bag when traveling by plane, which also meant that they had to pass x-ray checking at the airport. We did not discover any kind of haze on the films afterwards, although they had not been kept in special film containers.

FEATURES OF THE ROLLEI IR 820/400

The ROLLEI IR film has a wide range of tolerance, featured by a high reserve of sensitivity for all light conditions. The film base is made of polyester with an extremely high breaking resistance.

The resistance of the archive capacity is estimated to 500 years. The film grain is very fine and due to the 160 lp/mm, the images have an excellent image resolution.

FIELD TEST

For the field test, we used a NIKON F3 HP with a NIKON AIS 28mm lens. The NIKON F3 HP TTL meter works mainly within its selective light meter and the delivered light measurements have been basically correct.

We loaded the camera with a ROLLEI IR film with the required care and worked without an IR-filter, with a nominal film speed of ISO 400.

We used traditional B&W filters, such as yellow, orange, red and green. The tone range of the film was similar to a panchromatic film. The published pictures certify,

The following pictures show different results regarding clear sky and clouds for different filters. The filters' efficiency in "penetrating" the atmospheric dust differs as well.



Reference image, $T = 1/500$ sec. $f/11$.



Yellow filter, $T = 1/500$ sec. $f/11$.
Slightly strength of visible of clouds.



Orange-Filter, $T = 1/250$ sec. $f/11$.
The clouds are little more visible.



Kenko Red filter, $T = 1/60$ sec. $f/11$.
The upper sky segment begins to become darker.



Heliopan Red filter (645), $T = 1/60$ sec. $f/11$. Practically identically to the Kenko Red filter.



Heliopan Black filter (715), $T = 1/8$ sec. $f/11$. The vegetation is bright, the upper part of the sky is dark. The houses on the horizon are better differed.



Cokin Black filter 007 (89B), $T = 1/8$ sec. $f/11$. The result is similar to the Heliopan RG 715.



Infrarex Red filter (RG1), $T = 1/8$ sec. $f/11$. The results are comparable with two latter IR filters.



Infrarex Dark red filter (RG2), $T = 1/8$ sec. $f/11$. The results are comparable with the three latter IR filters.

In the following sequence of images, we are showing: On top, a picture made with a Nikon Coolpix 8400, in the middle, negatives made with the Nikon F3HP, and below, the corresponding positives.



Picture without filter, $T = 1/1000$ sec. $f/11$.
the following with filtering changes.

Hoya yellow filter Y K2, $T = 1/750$ sec. $f/11$.

Hoya Orange Filter G, $T = 1/250$ sec. $f/11$.

INFRARED FILTER: Go for the square ones!

You can use the same IR filter on B&W and colour films. They block visible light almost completely, but can be penetrated by infrared radiation. These filters are called "Black filters". Their function is to prevent visible light from reaching the film or, in digital photographs, the sensor. They are offered by several manufacturers and the most common ones are the 88A and 89B filters. We used the black filter Cokin 007 (#89B), Heliopan RG715 and the new Infrarex filter set in three shades: Red (RG1) and Dark Red (RG2) worked best. While Black (RG3) cannot be used with the ROLLEI IR film, it works with some very sensitive digital cameras.

As to the format we strongly recommend the square ones: You can hold them in front of the lens after setting of aperture, distance and speed. Besides, it can be used with different lenses up to a diameter of 72mm.

A filter holder is available as well. As we found out, however, in case of strong sunlight it was penetrated by light from the back, which results in whitish spots, best visible in dark sky.

This again is due to dust on the internal filter surface. Our advice: Cover the spare room between filter and holder with black tape in order to make it "impenetrable".



Setting of sensitivity of different filters:

Filter (*)	Film setting (**)
Yellow (# 8)	ISO 320 to ISO 200
Dark-yellow (#15)	ISO 200
Yellow/Green (#11)	ISO 200 to ISO 100
Orange (#21)	ISO 200 to ISO 100
Red (#25)	ISO 25
Red (#29)	ISO 25
RG 645	ISO 25
RG 665	ISO 25
RG 695 (#89B)	ISO 25
RG 715 (#88A)	ISO 25 to ISO 12
RG 780 (#87C) and higher, are not recommended!	

(*) Kodak Wratten filter marking in clips
 (**) For ISO 400 film.



Filter Black Infrarex T= 2 sec. f/11. No image registration on the film.

though, that the best results concerning separation of clouds and sky, black sky and atmospheric dust can be obtained by using a special black IR filter. While standard KODAK infrared films can generate the classic IR effect with a normal dark red filter, the ROLLEI IR requires usage of a special black IR filter. In order to find out whether your black filter really is applicable for IR photography, just use it with your digital camera and set the white calibration into solar light. If the colours change to magenta/violet, the filter is appropriate for infrared photography.

INFRAREX AND OTHER FILTERS

We also had the opportunity to test the new IR-filter series of INFRAREX, called RED (RG1), DARK RED (RG2) and BLACK (RG3).

With the RG1, we could obtain good IR results compared to the dark red RG2 filter. With the RG3, we could not get any results at all. This filter seems to let infrared rays through, which may not be possible to catch with this IR film. The results were completely transparent. But the INFRAREX Black (RG3) can be used with digital cameras.

Furthermore, we used the IR filters P007 (89B) from COKIN, and the HELIOPAN RG 715 and obtained similar results. We worked with f-stop 11 at a shutter speed of 1/30 up to 1/15 of a second. The negatives made with 1/30 of a second were perfect within the lights, but totally shut close in the dark shades. Details were visible with 1/15 of a second. Generally, we recommend to make one shot according to the light meter, and a second shot with a slightly higher exposure.

FOCUSSING

Infrared films allow normal focusing. With both, manual and auto-focus systems, it is worthwhile to adjust the distance according to the IR-index available on most lenses. We made some shots from greater distances with the lens set on infinity and, in comparison, with the distance on the IR-index. Due to the f-stop 11, we did not detect any difference.

But we like to inform you, that this compensation of focussing must be done in any case, using the ROLLEI infrared film with special IR-filters. When the ROLLEI IR film is used at ISO 200, with or without regular B&W filters, the focussing will be performed just as normal.

VINTAGE CAMERAS

If we talk about ROLLEI films, why not using the famous twin-lens ROLLEIFLEX? Right, there is no TTL-meter available for this older camera model, but a nice hand-held light meter will do the job, too. The sensitivity of the ROLLEI IR film with the use of special IR filter should be set between ISO 12 and ISO 25, instead of ISO 400, for exposures without IR filter.

To use a twin lens ROLLEIFLEX is not a bagatelle, because with each twin lens camera, the IR-filter must be attached to the exposure making lens, while the other lens must be used for focussing. Anyone who has ever tried to use an IR-filter on a normal SLR camera has noticed that it is extremely difficult to see anything through the SLR viewfinder. Therefore, viewfinder cameras are more convenient for focussing, because you don't have to look through the reflex viewfinder with the IR-filter in front.

Another advantage of the TLR ROLLEIFLEX (we refer to the latest models) is the simple film loading, compared to most other medium format cameras.

Back to the 35mm SLR cameras: It is an advantage to use the automatic program mode, or at least the f-stop priority mode, because it is absolutely impossible to see any display information at the viewfinder, while using an IR filter. The only risk with the light metering is, that the exposure times can be very long. Therefore, it is absolutely mandatory to use a stable tripod.

The use of panorama cameras will also be improved because these cameras are very difficult in film loading. On motorized cameras with an electric film frame reading system, which can be disturbed by haze when using conventional IR films, you will not have any problem using the ROLLEI IR film. No NIKON-camera disturbs the ROLLEI IR film with haze.



*Kenko Red filter SR60,
T= 1/125 sec. f/11.*

*Heliopan Red filter 645,
T= 1/125 sec. f/11.*

How to process the ROLLEI Infrared:

The ROLLEI Infrared ISO 400 film has no real anti-halo-layer, or better said, the anti-halo-layer is included in the emulsion. Therefore, it is recommendable, to do at least a pre-soaking of a minimum of 30 seconds.

Delution- and processing time data with 20°C:

Developer	RHS	RHS	RLS	RHC	RLC	D76
Delution	1+7	1+12	1+4*	1+9	1+4	stock
Processing time (Min.) (*) at 24°C.	6	8:30	18	-	8	6

For the further processing, the stop bath , fixing bath and watering, the process is the same as for all conventional B&W films. Reminder, that in opposite to the former MACO Infrared Emulsions, the ROLLEI Infrared can be processed at dim light.



The ROLLEI Chemistry: The two developer, Low- and High Speed, short-stopping stop bath, fixing bath, wetting agent.



*Heliopan Black filter 715,
T= 1/15 sec. f/11.*

Below in the series which begins with this picture, corresponds with the first picture on top taken with the Nikon Coolpix 8400, afterwards desaturated. It can be compared also an infrared admission with a digital compact camera, and on infrared film.



*Cokin Black filter P007,
T= 1/30 sec. f/11.*



*Infrarex Red filter (RG1),
T= 1/15 sec. F/11.*

FILM DEVELOPMENT

The ROLLEI IR film must be loaded into the development tank, as any other film material, in absolutely darkness. Then the process of development is normal, like with any other panchromatic film, in contrast to standard IR films.

It is required to pre-soak the film before the development process, maybe even more than once, until the water becomes totally clear. The first pre-soaking water colour will be a bluish black, just as if you were cleaning your old-fashioned ink pen.

As a film developer, we used the ROLLEI HIGH SPEED (RHS) developer (MACO LP-Supergrain) with a dilution of 1+12, a developing time of 8:30 minutes and constant tipping over during the first minute (then every 30 seconds).

The ROLLEI infrared film can be developed in most of the B&W developers on the market, but much better in the original ROLLEI chemistry, regardless of ROLLEI LOW SPEED (equal to MACO CUBE XS, a developer with highest solutions) or with the ROLLEI HIGH SPEED developer (equal to MACO LP-Supergrain, a fine grain developer) or at least with ROLLEI LOW CONTRAST (equal to LP-Dokufine LC, a smooth working developer) or with the ROLLEI HIGH CONTRAST developer (equal to MACO Dokufine HC, a developer with a fairly high contrast).

Our advice:

- HIGH SPEED developer for general use and for special under exposures (push) up to 2 stops.
- HIGH CONTRAST developer for dramatic atmosphere at the exposure time.
- LOW SPEED developer for exposures which must be highly enlarged for macro- or architectural images.
- LOW CONTRAST developer for a maximum of tonality and for high contrast images.

An extreme situation: We have unloaded the film under extreme sunlight in the Wadi Rum Desert in Jordan, while we had only our body shade: As consequence we had on the first two frames of the film a "light flame", fortunately, it affected only the film perforation. However, it will be better, to load and unload the film in a more protected areas, or to repeat shooting the image with 2-3 frames.





*Infrarex Dark red filter (RG2),
T= 1/8 sec. F/11.*



*Infrarex Black filter (RG3), T= 2 sec. F/11.
This filter let the IR lights pass through
with an wavelength of 800nm, not usable
for the IR films anymore. Nevertheless, the
picture could still be done with the Cool-
pix 8400.*

WHAT'S BEST: FILM OR DIGITAL SENSOR?

One thing is for certain: both, chemical and digital technology, should be used for different purposes. At high IR density or with removed lithium-filter, the digital camera operates at higher speed compared to the IR film. Furthermore, the results can immediately be verified.

Where digital photography produces a lack of resolution and reproduction, a paper print made on traditional baryt-paper is of much higher quality, than a modern ink jet printer or chemical B&W paper-print can ever achieve.

A traditional B&W photography certainly is a challenge for man and technology. But the challenge has it's very own appeal.

Gerardo Bonomo

We thanks the photo lab of Donato Navone in Milano, who has printed the pictures in this article.

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