

Infrared Films Underwater

by Mark Mumford



“The man must be barking mad!” I hear you say!

Well you must have recalled my article in Issue One about getting your local developer to correctly print negative films, and you remembered that colour levels drop off very fast underwater, with reds being the first to go. If this is the case (and it is!), then what on earth would we want with infrared films underwater?

You may also recall from my that article that one solution to the problem of colour loss is to shoot on monochrome film stock, as black and white film doesn't really care what colour is in front of it. And Kodak manufactures an infrared black and white film. Is it starting to fall into place yet?

KODAK High Speed Infrared Film is a high-speed film with moderately high contrast, sensitive to light and radiant energy to 900 nanometres (nm) in wavelength. It

is useful for [atmospheric] haze penetration and for special effects in commercial, architectural, fine art, and landscape photography.

Infrared films are sensitive to infrared radiation, some ultraviolet radiation, and to all wavelengths of visible radiation (light). They are not as sensitive to green light. Whatever the ultimate purpose of your photographs, infrared photography provides unusual effects obtainable by few other means.

While the film is sensitive to a very wide spectrum, it is generally used on land in conjunction with either a deep red (Wratten 25) or completely visually opaque (Wratten 87 series) filter. These filters remove the majority of visible light allowing the film to be exposed to just the infrared components. However, without these filters, it is quite usable underwater for natural light

Of course without any particular highlights, a fairly normal black and white photograph is obtained. As mentioned before, this tends to be more grainy than would be expected for the degree of sharpness, and effect that could probably be similarly obtained using conventional black and white film in a number of ways. You may notice in this photograph the lack of contrast in the background compared to the foreground subject. While this is usual underwater, it is exaggerated in this case, and I would put this down to the extra ultra-violet sensitivity of the film, and diffusion of light through the water.



On land, with a red filter, the film is noted for returning false “colours” compared to conventional black and white film, rendering objects that emit or reflect infrared light as white, against black for those that do not. Blue skies will be rendered black, and grass, foliage and skin-tones will be rendered white. Taken underwater of course, these effects will not be noticed. We cannot use red filters because we wouldn’t be left with any light at all! So used without filters, and at moderate depths, we will be recording using light primarily in the blue spectrum as the film is at least 10 times more sensitive to blue light than it is to green. In fact it is so sensitive to blue and ultra-violet that it might be worth using a skylight or UV filter to try and reduce this a bit.

This picture shows that the film can return quite good resolving power, but appears to be quite grainy (if that isn’t a contradiction). It is moderately sensitive to developer, and a fine-grain developer such as Kodak XTOL will return a more finely grained negative, albeit at lower contrast (that makes sense doesn’t it!).

photography, and gives some interesting results.

The real downside about using this film is caused by exactly those characteristics that gives it its special properties. The combination of high infra-red sensitivity, and the lack of an anti-halation layer means that the film must be loaded and unloaded from the camera in total darkness, which means in a proper changing bag. Even the film cassette isn’t safe, and enough light can get through the normal opening to ruin a film, which must be kept in the provided opaque containers. I

develop the film myself, not trusting even pro labs to get it right all the time.

On land, being primarily used for infra-red applications, an ISO rating cannot easily be given, as the film is sensitive to light that isn’t registered with conventional light meters. Underwater, I usually set it at ISO 200 which returns me a reasonably dense image, and I’m sure that it could cope with ratings from ISO 50 to ISO 400 or greater depending on the depth and the amount of UV penetration. Interestingly, the film has been

noted for returning different grain and sharpness depending on the speed that it is rated at - i.e. depending on the amount of exposure it receives! You might have spotted that the two examples shown previously that were taken on land have considerably lower grain and improved resolution.

If you enjoy black and white underwater images, then you might also want to experiment with this film. I’ve still got a long way to go with it, and would like to try it out for flash-lit macro work in true infra-red mode with a red filter. I



The other major special effect from this film is that of “blown” highlights. Shadows contain good detail, but highlights tend to blur into one another. This is because the film is fairly unique in that it does not have an “anti-halation” backing layer, so light that passes through the film isn’t absorbed by this layer, reflecting off the camera back and coming back through the film for a second time.

think that the next time that I use it for natural light wide-angle shots, then I will perhaps put a standard UV filter in front of the lens and see if that improves the background contrast.

Notwithstanding the purist approach, once you understand the special characteristics of the film, and how it behaves, a competent Photoshop operator should have little trouble simulating the effect given a standard black and white, or even colour, photograph. Working with infra-red negatives also gives you the opportunity to play with hand-colouring (or computer colouring) on a photo that starts out looking a little different!

What next? Kodak Technical Pan - a lithographic film - that’s what!

I’ll let you know!

Mark Mumford

Ring of Bright Water



Inon’s Quad Flash is one of the most innovative tools ever made available to underwater photographers. The four reflectors provide shadowless lighting with an ethereal quality all of its own. The compact size is less intrusive than conventional strobes and makes animals much more approachable.

The Quad is packed with useful features such as an automatically activated modeling light to assist autofocus and Nikon compatible TTL. To get creative there are three manual powers and a built in shade lets you block off two of the reflectors.

Available with ports to suit both Subal and Sea and Sea SLR housings. Quad from £995.00. Ports

from £299.00. For a full review by award winning photographer, author and underwater photography coach Mark Webster see UwP Issue 2 at <http://www.uwpmag.co.uk>

Ocean Optics

13 Northumberland Ave, London WC2N 5AQ

Tel 020 7930 8408 Fax 020 7839 6148

<http://www.oceanoptics.co.uk>

Whether you're on the water, in the water or by the water, we can cater for all of your needs.

With helpful and experienced staff you will find it easy to get the exact kit to suit you.



**11 - 14 Northumberland Avenue
London, WC2N 5AQ**

Tel: 020 7930 5050

Fax: 020 7930 3032

OCEAN LEISURE

email: info@oceanleisure.co.uk