

Behind The Magic

By Alexander Mustard

Just over a week ago, Peter Rowlands and I sold our first Magic filter! Magic is a new type of filter we have developed for producing digital colour images using only ambient light underwater! In this article I want to share with you my experience of how a private project turned, as a result of beer-fuelled banter, into a product we could potentially sell to a digital SLR photographer anywhere in the world!

I don't want this article to read like a press release or a sales pitch, instead I hope it provides some insight into the process of what goes into producing a new piece of kit. Visit the website if you want to read the sales pitch at www.magic-filters.com although you still won't find the hard sell. We are just enthusiasts trying to help out others like us, who are addicted to taking images underwater.

To start at the beginning, my interest in filters really began in the Red Sea in 1998. Peter Scoones had chartered the liveaboard *Coral Queen* to film for the BBC series *Blue Planet*, and a group of underwater photographers were invited along to fill the other cabins. During that trip I was bowled over by the amazing colours of the moving images that Scoones was capturing with just available light, a filter and his Digital Betacam. Peter Rowlands was also on that charter and was kind enough to share his knowledge of shooting underwater stills with filters (his 1983 book, *The Underwater Photographer's Handbook*, remains a classic reference on the subject). And since that trip I have been a filter addict!

Can you see the magic? These two images of the Giannis D wreck were taken at about 15m in the Red Sea. Both are taken only with available light. The image on the left was taken on slide film in 2001 and the image on the right with digital camera and a Magic Filter in 2005, both by Alex Mustard.

Left: Nikon F100 + 16mm lens, Provia 100. Right: Nikon D2x + 10.5mm + Magic Filter.



That said, I found that filters rarely produced pleasing images on slide film. It was just too difficult to get the right colours. Just being a foot (30cm) too deep or shallow would make the difference between producing a satisfying image and a duffer! What I needed was a still camera like Scoones' digital video, which would enable me to fine-tune the colour balance of my shots. That camera became a reality for me in 2002 when I got a Nikon D100 and Subal housing, which being a digital camera had the adjustable white balance I had desired for so long. I was so keen to test this new capability that my first pool shots with the D100 were white balance tests rather than experiments with any other feature of the

camera (those images actually appeared in UWP 11 in February 2003)!

Thankfully the technique worked and ever since I have been shooting digital with filters and available light at every suitable opportunity. I don't think filters are for every dive; they work best in a shallow (<15m) blue water, in conditions where there is lots of light. A sunny day in the tropics is a good place to start. Darker, temperate green waters tend to be less suited to filter photography. The technique is pretty simple, but allow a couple of dives to get on top to them. Once you are familiar, filter photography is point-and-shoot simple (note that many of the images accompanying this article



Here, viewed on a lightbox, are just a few of the filters that I have used for underwater photography, including some finished Magic filters. (The pink filters are various CC Reds that look this colour when backlit by a lightbox).



The Magic Filter was designed as a gel so that it is compatible with the popular lenses for underwater photography. It just slots into the rear filter holders on many popular wide angle lenses.

are shot in auto exposure).

I have used many filters over the last few years and firm favourites have been Kodak's Wratten CC (Colour Compensation) Red series and UR Pro's CY and SWCY filters. Both have strengths but neither was the perfect solution for me and this is what started me on the path to Magic.

The main limitation of CC Red filters is that only work in very narrow depth range, for example I have found that the CC40R only produces pleasing images between 2 and 6 metres, even with adjustable white balance). This makes them impractical unless we know the exact depth of the subject before we dive. UR Pro's filters are designed specifically to counteract the filtering effect of seawater and work very well. They are an excellent choice

for videographers and work over a wider depth range (I find the CY works best on stills between 4 and 12 metres). Frustratingly, for the still photographer UR Pro filters are only available as glass or thick optical plastic, which means that they cannot be physically fitted on the most popular SLR wide angle lenses such as fisheyes (which can only take gel filters).

So my two main design criteria were first that the filter could be used with my favourite wide angle lenses and second it would work over a wide depth range. To maximise lens compatibility the obvious solution was an optical quality gel filter, which can be cut to fit pretty much any lens, and crucially is the only type that fits in the rear filter holders on many Nikon, Sigma and Canon wide angles.



I designed the Magic Filter to work over as wide a depth range as possible. The Magic filter differs from other UW filters as it is not designed to perfectly counteract the filtering effect of seawater because this is highly variable. Instead it adjusts colours to produce a colour balance that is easily corrected by the camera's white balance. The Magic Filter produces pleasing colours from the surface down to 15m in clear, brightly lit, blue water.

Top photo by Peter Rowlands at 1m. Nikon D70, 16mm, Magic Filter, aperture priority, 1/30th @ F8. Right photo by Alex Mustard at 15m. Nikon D2x, 16mm, Magic Filter, shutter priority, 1/50th @ F4.2.





This snapshot was taken at about 15-17m and shows that the Magic Filter still produces useful results below its quoted depth range. Note the colours on the divers. Nikon D2x + 10.5mm + Magic Filter. 1/50th @ F7.1.

To make the filter work over a wide depth range was more tricky. The Magic differs from other filters because it is not designed to perfectly counteract the filtering effect of seawater because this is highly variable (e.g. with depth). Instead it adjusts colours reaching the sensor to produce a colour balance that is easily corrected by the camera's white balance. This is a new approach for underwater filtration, one that takes full advantage of the new technology of DSLR cameras. This enables the

Magic filter to work from the surface to 15m (and produce reasonable results slightly deeper). As a consequence the Magic filter will not work at any depth with daylight balanced slide film.

To say that I arrived at the recipe purely with brainpower would be a big lie! I took 6 different filters to the Red Sea in June to try and the one I thought would work best didn't. It was actually the one that I had initially palmed off to Peter Rowlands to test, that worked best and ended up as The Magic Filter.



The filter means that once you have set your white balance great colours just come straight out of the camera, as if by magic. Photo by Peter Rowlands, Nikon D70 + 16mm + Magic Filter (no flash), Aperture priority, 1/60th @ F5.6 at 6m depth.

By the end of the week there were 6 DSLR shooters on our boat testing the limits of my favoured filtration cocktail!

At this stage my motivation was only to develop a filter that I could use to produce types of shots that other underwater photographers could not. But as the week went on everyone who tried the filter made me promise to share them. And after a few beers I agreed. Peter Rowlands also convinced me that we should get some made commercially

so we could supply them to digital photographers around the world who want filters for their DSLRs. Peter is an avid supporter of filters for digital photography and is always keen to increase their popularity. He practises what he preaches too - I have been to the Red Sea with Peter twice this year and have yet to see him use a strobe (I have yet to see him night dive either!).

So it was decided. When we got back to the UK we set out to find out what

was involved in making the Magic. Peter contacted filter manufacturers, while I tried to gauge the potential interest, as I didn't want to end up with sheets of unwanted filter stacked up beneath my bed! Optical quality was absolutely essential so we decided to get the filters made to by one of the world's leading filter companies and cut to fit the popular SLR lenses for underwater shooting. We also specified polyester optical gels, rather than traditional gelatine so they would be waterproof and more durable.

The next obstacle was making the packaging, which was no small challenge on our shoe-string budget. We felt it was essential to provide details on setting white balance and shooting with filters to help people get the best results since we had both seen many people give up on filters in the past. Although simple, the techniques of filters do take some getting used to. We also had to choose our Magic signature image and in the end I chose one of Peter's shots, to appear on the packaging and website, as it was my favourite that



The really exciting aspects of filters is that they allow us to shoot larger areas (that we could light with flash) in colour and that we are still learning so much about what it is possible to do with them. Nikon D2x + 10.5mm + Magic Filter. 1/40th @ F7.1.

It is our hope that the Magic Filter will introduce many to the simple delights of shooting in available light underwater. I've definitely found it tougher than I thought to persuade other photographers to leave behind the security blanket of their strobes and experiment with filters. But we hope that the inexpensive Magic will convince you to try, and once you have we hope you will experiment with other filters too. Filter photography is a new technique for stills and there is still a lot to learn from each other. From our first conversation both Peter and I wanted to price the Magic so all DSLR shooters would have no excuse not to buy one! We know once you try it, you'll be a filter addict like us too!

So now the fun really begins. It is very exciting sitting here in the UK, sending filters round the world and waiting to see the images that underwater photographers are able to create with them. There are still so many experiments to make and so much to learn. Filter photography has always been a niche technique in underwater photography, but we hope that digital cameras and products like the Magic will ensure it earns a place in the mainstream.

Alex Mustard

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photography
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Prices start at just £19
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either of us produced in the Red Sea.

So where does the catchy Magic name come from? I'd like to claim great marketing insight, but embarrassingly it actually comes from me joking about on the boat – explaining that I had used some *Mustard Magic* when fellow photographers wanted to know the secret to my available light shots! Thankfully I was keen to drop my name from the official product and it is now the snappily titled Magic filter.

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MV Typhoon



©Peter Rowlands

Alex photographing an aggregation of snappers at Ras Mohammed. This trip is timed to co-incide with the appearance of these large schools.

** Packages excluding flight can be arranged.

The unique combination of Alex Mustard, UwP Editor Peter Rowlands and Tony Backhurst are collaborating to bring you this special event in the Red Sea where you can concentrate on your underwater photography and benefit from Alex's digital knowledge and enthusiasm.

MV Typhoon has been especially chosen for this trip because of her underwater photographer-friendly design (by Tony himself), great hospitality and the diving freedom essential for producing stunning images.

In addition UwP Magazine will have a range of new photo equipment on board for you to try out.

In Alex's own words "Shooting digital is different from film. Digital has made getting technically correct images easy. I will help transform your pictures from images that come out into images that stand out. I will also show you the new techniques that digital has made possible such as available light filtering, telephoto and panoramas and cover post processing as well as giving informal illustrated talks each evening."

This is the perfect opportunity for you to improve your images and have a great holiday in a photographer friendly atmosphere on a superb boat.

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