Successful Filtration

Part 1
Using Neutral density Graduated filters.

I should start this article by stating my key philosophy behind the use of filtration in landscape photography:

"If you can tell you've used a filter, then your use of it has failed."

All filters should be used purely to allow the film to see the subject in the same way that the human eye does. In other words we are trying to recreate on film the scene as it appeared to us when we stood behind the camera.

In order to grasp this concept it is important to realise that no film on the market today is able to recreate the impression we get when looking at our subject in all situations. For example, when we look at a subject that contains bright highlights and deep shadows, our eyes adjust to see detail in both, whatever the contrast range. Our eyes do this by allowing in more light when we look at the shadows and less when we look at the highlights, thereby reducing the perceived contrast. Film cannot do this as the amount of light let in is fixed to a selected aperture and shutter speed combination. We must, therefore, use filters (Neutral Density Graduated filters) to reduce the contrast range such that it is within the range that the film is capable of recording.

Car near Museo de la Revolucion. This particular shot needed 7.5 stops of neutral density grad to balance the brightly lit building and the dark car.
Canon EOS10D 20mm 1 sec f22

Subject Brightness Range.

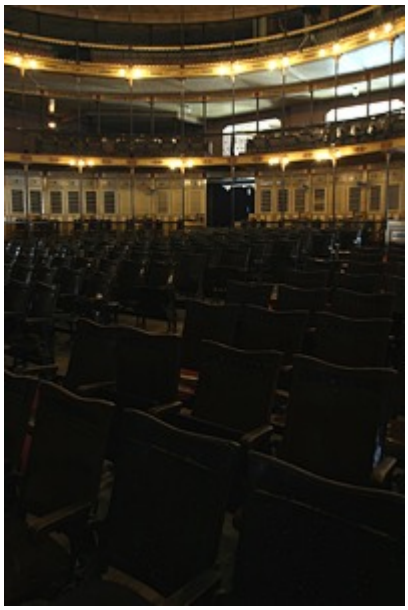
Colour negative film is capable of recording a far larger brightness range than colour positive or transparency film. As most of us use colour transparency film for landscapes, I will concentrate on this medium. The brightness range that a film can handle varies from product to product and indeed different photographers may have slightly differing ideas as to how big this range is. Personally I tend to work on two stops either side of the exposure I have chosen as being acceptable. By this I mean that once I have chosen a particular aperture/shutter speed combination, based on a particular part of my composition, anything more than two stops brighter or darker than that point will appear either as see through film or completely black film respectively.

As I am shooting colour transparency, my main aim is to capture as much colour as possible, and neither see through film or completely black film are desirable. For this reason I often say that "contrast is the enemy" of colour photography.

When confronted with a composition where the subject brightness range exceeds the guidelines quoted above, you are left with three choices:

- Accept that part of your image will be over-exposed and will record as see through film
- Accept that part of your image will be under-exposed and record as pure black film
- Use a Neutral Density Graduated filter to reduce the contrast range.

Author: Phil Malpas – Phil Malpas Photography December 2004



Teatro Thomas Terry, Cienfuegos In this example no filtration was used. When correctly exposing the background. The chairs in the foreground are heavily underexposed.
Canon EOS10D 17mm 3 secs f11

Teatro Thomas Terry, Cienfuegos. By adding 5.5 stops of neutral density graduated filter, I have been able to increase the exposure of the foreground seats without affecting the background.
Canon EOS10D 17mm 25secs f11

Neutral Density Graduated Filters.

The key word to consider when looking at these filters is "Neutral". Some filters on the market today are more properly called "Grey" graduated filters. In many cases these are not neutral density at all but are actually coloured filters that profess to do the same job. I'm afraid that when it comes to buying these filters, you absolutely get what you pay for. In other words, cheaper "grey grads" are not manufactured to the same exacting tolerances as the more expensive "ND grads" and will often result in a colour cast in the final image. As a result they do not comply with my key philosophy mentioned at the beginning of this article. True "ND grads" are, as the name implies, completely colourless; they only contain neutral density and will not change the colour reproduced on film at all.

So what exactly is a "Neutral Density graduated filter"?

All ND grad filters consist of an optically clear material, part of which is completely clear and part of which has neutral density added. Between these two regions of the filter is the "graduated" bit, where the density gradually changes from clear to the same as the area containing density.

There are two main types available, circular ones that screw on to the front of the lens and rectangular ones that fit in some form of filter holder. Of these two types, the rectangular type are the best option, as the area of graduation can be moved relative to the lens, whereas in the circular type the graduated area tends to be fixed in the centre of the image.

The numbers and properties of the ND grads on the market can be a bit confusing. There are two factors that you need to consider when selecting which ones to purchase – the amount of density in the ND part of the filter, and the area over which the graduation takes place. I will attempt explain exactly what this means:

Lee .3 (one stop) ND grad soft.
This is a scan of my one-stop ND grad
It has a 'soft' graduation area
i.e. the change from clear to dense
covers a large area of the filter

All good quality ND grads are specified with a particular value in “stops”. This value refers to the amount of light that the fully dense part of the filter cuts out. For example a 1 stop ND grad will allow twice as much light through its clear portion as it will through its dense portion. Similarly a 2 stop ND grad will allow 4 times as much light through its clear portion as it will through the dense portion. Just to confuse things, the terminology used to define the number of stops the filter will cut out is the logarithmic scale. You will therefore see filters categorised as follows:

- 0.3 ND Grad = 1 stop of density
- 0.45 ND Grad = 1.5 stops of density
- 0.6 ND Grad = 2 stops of density
- 0.75 ND Grad = 2.5 stops of density
- 0.9 ND Grad = 3 stops of density

The second property of these filters is the area of the filter over which the graduation takes place. There are two types available: “soft” and “hard”. The “soft” filters simply have their graduated area “spread out” further than the “hard” filters. i.e. the graduation takes place over a smaller area and is more abrupt in the hard version. When it comes to choosing between hard and soft grads, different photographers have different preferences. I always think that hard grads are more useful to the 35mm user, because relative to the film size, the graduated area can be more accurately placed. Those using medium or large format film may find it easier and less likely to be visible if they use the soft version.

As a start point my recommendation would be to purchase a 0.3 (1 stop) and a 0.6 (two stop) ND grad of the hard variety. Although you should always seek to minimise the number of filters you place in front of your lens, these two filters can, if absolutely necessary, be used together to give you the equivalent of a 0.9 (3 stop) grad as well. (At least until you can afford to by a proper 0.9 grad)

So how do I use my nice new ND grad filters?

In order to successfully use these filters you will need (somehow) to be able to take meter readings from different parts of your subject. The ideal tool to achieve this is a hand held spot meter, but you can also manage perfectly well with a through the lens spot meter as supplied on most modern SLRs. Without either of these options, the use of these filters does become a bit hit and miss, although it is not entirely impossible. You will need to point your camera up at the sky to get a reading for that and then down at the foreground and use these two readings as your basis for deciding which filter to use.

Lee .9 (three stop) ND grad soft.
This is a scan of my three-stop ND grad
As you can see the dense part of the
filter appears much darker than
the one stop filter

Lets imagine that you are down by the seaside, messing about in the rock pools, and decide to set up your camera to photography the fantastic rocks in the foreground and the beautiful sky in the background. You take meter readings of the darkest parts of your foreground and the brightest parts of your sky and find that there is a 6 stop difference. Perhaps you need to use f22 to be sure you get front to back sharpness and the meter reading from the darkest rocks is 1 second and the meter reading from the brightest sky is 1/60th second. We could choose to set the camera to 1/4 second and be sure that the detail in the darkest rocks will record successfully because they are within two stops of our chosen exposure. Unfortunately this would mean that the brightest areas of the sky are now 4 stops above our chosen exposure and as such will record as see through film. Conversely we could set our camera to 1/15th second to rescue our sky, but now the darkest rocks will appear as completely black film and the wonderful details in this area will be lost. We therefore have a problem.

The answer in this case is to completely ignore the sky in our initial calculations. We should take a number of readings off the darkest and brightest parts of our foreground i.e. excluding the sky. Perhaps we find that the rocks give a reading of 1 second as before and the reflection of the sky in the rock pools gives a reading of 1/8th second. We now know that by setting our camera to 1/4 second both these areas will record with full detail.

We can now turn to the sky which currently requires 1/60th second. By employing our 0.6 (two stop) ND grad over the sky we reduce it's brightness (as seen by the film) and therefore increase the amount of time it requires to expose correctly. The unfiltered 1/60th second becomes 1/15th second with the filter in place and now all parts of our composition fit nicely into our two stops either side of the camera settings.

The darkest rocks will be two stops under (they required 1 second) and the sky will be two stops over (it required 1/60th minus the two stops blocked by the filter i.e. 1/15th) when we expose at 1/4 at f22. All parts of the image will be fully saturated with colour and show all the wonderful detail we were trying to capture.

This is a simplistic example and in the real world nothing can take the place of experience when aiming for successful use of these filters. It is important therefore that you make detailed notes of exactly what your readings were, which filter you chose and what you hoped it would achieve. You can then look at your results and evaluate your success. This sort of feedback is important particularly to the inexperienced user.

Personally I use the LEE filter system which I would recommend to anyone. The filters and their adaptors are well made and of excellent quality. With care, these filters can last a long time and the extra initial expense is, in my opinion, well worth it.
