



ASHLEY POMEROY

Pola filters

Do you really need lens filters for your digital EOS? All the effects can be added after the photo has been taken, can't they? Well, mostly, but there is one filter which is essential for photographers, says Chris Mattison.

If you shoot film you might need colour correction filters to match the film to the ambient light – or to give a warm glow to scenes with cool illumination. A soft focus filter is needed if you want softer tones, especially flattering in portraiture. Starburst and other special effects filters can be used if you want to add unusual effects to the image.

All this has changed with digital photography. Colour correction? Just change the white balance, Picture Style or hue in Canon's Digital Photo Professional software. Soft focus? Just add Gaussian Blur in Photoshop or Photoshop Elements or select the Soft focus Creative filter (EOS 600D and 60D only). Special effects? The Filter menu of Photoshop and Photoshop Elements offers more choice than the Food Hall at Harrods.

But there are still times when getting it right before you shoot, like you have to with film, is the only way to create the images you want.

Above Among other effects, a polarising filter will darken blue skies, making white clouds stand out more strongly. This filter is from the Cokin range. It drops into a holder attached to the front of the lens. Polarising filters must be rotated to find the position which gives the strongest effect. The serrated surround of this Cokin filter makes it easy to turn in the holder. Many other polarising filters screw directly to the front of the lens. They are in a rotating mount – the front section, which holds the filter, can be turned without the mount being unscrewed from the lens.

Saturate your colours

Have you ever wondered how some photographers manage to get such saturated colours in their images? It's all down to the effective use of a polarising filter. This cuts through some of the reflected light to show you the true colours of the subject.

We tend to think of polarising filters doing two different jobs – darkening blue skies and reducing reflections from water and glass. In fact, these are two sides of the same effect, as you will see.

A polariser is the one filter which will help every EOS user to improve and enhance their images. It is not the cheapest filter available, but it is the most useful to have in your gadget bag.

Blue sky thinking

A polarising filter can help to darken blue skies. However, the strength of the effect depends very much on the blueness of the sky to begin with, the angle of the sun to the camera lens axis, and the rotation of the filter.

Polarising filters produce the most dramatic effect when you are photographing at right angles to the sun. Hold your hand with your thumb at right angles to your extended index finger. Point your finger at the sun. Now rotate your wrist. The arc drawn by your thumb is the area of the sky which will be most affected by a correctly positioned polarising filter.

For example, if the sun is overhead your thumb will draw an arc around the horizon – every point on the horizon will be equally affected by the filter. If you shoot shortly after sunrise or sunset, only the horizon at north and south will be affected (your thumb draws an arc over your head from north to south).

WYSIWYG

With the polarising filter on your lens, what you see is what you get (WYSIWYG). This is the advantage of using a polarising filter with your EOS camera – looking through the viewfinder you will see the effect change as you rotate the front filter, allowing you to judge exactly how much polarisation you want, if any. You are in complete control.

The best effects occur when the sun is shining and there is already some blue in the sky. However, polarisers can sometimes improve your image even in overcast conditions. If in doubt, try taking shots with and without the filter.



Above Create an 'L' with your thumb and index finger. Point your finger at the sun. Anywhere your thumb can point will give the deepest blue sky.

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CHRIS MATTISON



Above On days when the sky is a pale, washed-out blue colour and fills more than half the frame (above top), the camera exposure meter will be fooled into underexposing it. Underexposing a light blue sky will make it medium-toned. But this will also underexpose anything else in the frame, making trees and buildings appear as silhouettes. What you need to do is to make the sky darker without darkening other parts of the image. Using a polarising filter to darken the sky, the exposure of other objects in the frame will not be affected (above). No more silhouettes.



CHRIS MATTISON



TARIQ OZALBI

Left The change in tone down the sky is caused by the variation in the polarised light from different areas. This is often seen in horizontal panoramic photographs, where it can be unwelcome – especially when the darker area is in the centre, fading to the edges. In vertical format landscapes, it can enhance the image. EOS 5D with a TS-E 45mm f2.8 lens, 1/250 second at f7, ISO 100.

Above In the right conditions, using a polarising filter can give an unreal deep blue colour to the sky. You need to start with a bright sun and a rich blue sky, so it is not an effect you can create for every picture. You might never see a sky like this with your naked eye, but you can't deny that it adds a strong impact to the image. EOS 1N with an EF 20mm f2.8 USM lens, 1/125 second at f8, Fuji Provia film.

Reduced reflections

Polarisers remove, or reduce, the amount of glare reflecting off non-metallic surfaces. These include glossy leaves, grass and rocks, as well as glass and paint, most of which reflect a considerable amount of white light on a bright day (and even more on a 'white sky' day). Using a polariser here has the effect of saturating these colours, because you are seeing the true surface of the subject. The effect can be used for foliage in landscapes as well as close-ups of flowers.

Reflection angle

Although you can use a polarising filter to reduce the reflections from a non-metallic surface, the effect is minimal with the camera square on to the subject.

The optimum angle for the camera is around 37° for water and about 34° for glass, though you do not need to be this precise for most subjects. If you look through the camera viewfinder you can see the reflections start to disappear as you rotate the polarising filter in its mount. If they do not fully disappear, try altering the angle of the camera to the reflective surface.

Keep in mind that if the surface is not flat, you may not be able to eliminate the reflections completely.



LEE BEEL



Above and right The unwanted reflections on the side of this lorry (right) are almost eliminated by careful use of a polarising filter (above). If you are shooting this for a client, there is no doubt as to which image they will prefer – and expect. *EOS 5D Mark II with an EF 70-200mm f4L USM lens, 1/25 second at f16, ISO 200.*

Enliven your landscapes

A polarising filter is very effective when shooting landscapes – and not just to darken blue skies. Foliage is a non-metallic subject which often reflects a lot of polarised light towards the camera. It is surprising how the foliage comes to life when a polarising filter is used. Grass and other greenery shows its true saturated and vibrant colours.

It is difficult to create this effect using Photoshop or other imaging software – the colours are masked in the original image by the reflections from the foliage.

Right and far right

In the smaller image (right), taken without a polarising filter, you are mostly seeing the reflections of the sky in the foliage and grass. In the larger image (far right), a polarising filter has reduced the reflection to show the true colours of the subject. You can also see how the polarising filter has cut through the haze (see page 62) to show more detail in the distant mountain.

EOS 5 with a TS-E 90mm f2.8 lens; Fuji Velvia film.



CHRIS MATTISON

Cut through to the true colours

Below and right These lily pads (below) are very shiny. What you are mostly seeing are the reflections from the sky. These have muted the colours of the subject. See the difference when a polarising filter is used (right). The lily pads are now a vibrant green – their true colour. You will see similar effects with other foliage, as long as the shooting angle is correct.

EOS 5 with an EF 50mm f1.8 lens; Fuji Velvia film.



BILLY STOCK

Reveal the hidden depths

There are certain situations where no amount of image manipulation will manage what a polarising filter does with ease. Seeing into water is one example. A polariser can capture detail which is totally lost if you shoot without a filter.

Below and right In the small image below, all you are really seeing is a reflection of the sky from the water. Anything in the water is hidden from view by the glare. However, use a polarising filter and the full picture is revealed (right). The filter has eliminated almost all the reflections from the surface of the water, giving a detailed view of the kelp which lies beneath.

EOS 5 with a TS-E 90mm f2.8 lens; Fuji Velvia film.



CHRIS MATTISON

Retain reflections

Blue sky and white fluffy clouds doesn't always mean you should use a polarising filter. In this example (below), the water is made more interesting by letting it reflect the sky and clouds. The shot with a polarising filter (bottom) looks quite drab by comparison.

Below and bottom *EOS 20D with an EF 70-200mm f4L USM lens, 1/8 second at f16, ISO 100.*



LEE BEEL



Polarising hints and tips



CHRIS MATTISON

Rotating filter mounts

A polarising filter must be turned to just the right position to give maximum effect, especially to reduce reflections (see opposite page). Unfortunately, some EF and EF-S lenses have a front element which rotates as the lens is focused. This means that if you set the polarising filter and then focus or refocus, you will have to set the filter again.

The obvious solution is to focus first and then adjust the rotation of the filter. Remember not to focus again without resetting the filter. You can avoid this problem by using an EF lens which does not have a rotating filter mount.

Exposing with a polariser

A polarising filter blocks unwanted polarised light. This means that the amount of light passing through the lens is reduced and so an increase in exposure is needed. This is usually around 1.5 to 2 stops.

Most of the time you can forget about this. The E-TTL exposure metering system of your EOS camera will automatically compensate for the loss of light, providing you are using a circular polarising filter (see opposite page).

Cutting through haze

Haze often spoils a photograph of a distant landscape, making it dull and lifeless.

Haze occurs when light bounces off water particles in the air. If the conditions are right, using a polarising filter will cut through the haze, increasing the colour saturation of a landscape.

You can check to see if a polarising filter will cut through the haze simply by holding the filter up to your eye.

Above A polarising filter reduces the light passing through the lens by around 1.5 to 2 stops. This can be put to good effect when photographing running water. Set the camera to aperture-priority (Av) shooting mode and select a small aperture – f11 or f16. This will force the camera to set a slower shutter speed than would be needed without the filter, giving a pleasing blur to the moving water. On a bright, sunny day, the shutter speed might still be too fast for a pleasing effect. In this case you can add a neutral density (ND) filter to force a slower shutter speed. ND filters come in a variety of strengths from x2 upwards.
EOS 5D Mark II with an EF 24-105mm f4L IS USM lens set to 58mm, 1 second at f22, ISO 100.

Lens hood

Always use a lens hood when you fit a filter to your camera's lens. The filter will be flush with the end of the lens barrel and susceptible to any light hitting it from an angle. This can cause flare – either a streak across the image or a general loss of contrast. A lens hood will help prevent this.

Filter combination

There is nothing to stop you combining polarising filters with other filters, but there are two things to bear in mind. Firstly, stacking filters can sometimes cause vignetting, where the rims of the filters are visible in the corners of the frame. This is more of a problem with wide-angle lenses. Secondly, as you add more and more glass to the front of your lens you will, inevitably, reduce the crispness of the resultant image.

A useful combination is a polarising filter with a neutral density filter. This increases the exposure, blurring any moving subjects in the scene, such as water. At the same time, the polarising effect helps to increase the colour saturation of foliage.

Do not use for portraits

As a general rule, you can use a polarising filter for most outdoor subjects. In situations where it is not effective, it will do little harm – if you can accept the slight light loss.

However, the one subject which should never be photographed using a polarising filter is a person. It will remove all the reflections which give skin its characteristic texture and shine. Instead, the skin will look as if it has been coated with a matt paint.

Wide-angle lenses

Be careful when using polarising filters with wide-angle lenses. This will often create an uneven tone across the frame, ranging from full polarisation in the area at right-angles to the sun, to little or no polarisation. Horizontal images are worse than vertical pictures in this respect, because they take in a greater sweep of the horizon.

How polarising filters work

Linear and circular polarising filters

When rays of light pass through the lens of your EOS camera, most of them are reflected up to the viewfinder by the reflex mirror. However, the centre of this mirror is semi-transparent. Some of the rays of light pass through and hit another, smaller, mirror (often called the 'sub-mirror'). Here, they are reflected down to the autofocus sensor in the base of the camera.



Filter care

Polarising filters often have a softer surface than other filters. Keep them in a protective case when not in use. Treat the surface of the filter as you would the surface of a lens, cleaning it with a soft, dry cloth.

Canon filters

Canon supplies a range of circular polarising filters in sizes from 52mm to 77mm. Hoya and B+W, among others, also supply polarising filters which screw into the filter mount of the lens. Cokin produces a polarising filter in a circular mount which drops into a holder and can be rotated. Lee Filters produce a polarising filter in a circular mount which rotates in a holder, but also produce a square polarising filter which fits into a rotating mount.

Rainbows

Do not use a polarising filter when photographing rainbows. It will make the rainbow disappear.

Vapour trails

Just as polarising filters increase the contrast between clouds and blue skies, they have the same effect on jet plane vapour trails. Even vapour trails which appear to have dissipated when viewed with the naked eye will become obvious when viewed through a polarising filter. This might not be a problem for you, but it is something to keep in mind.

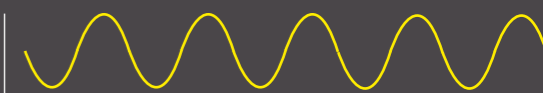
The light rays are polarised as they are reflected from the sub-mirror. However, if the light is already polarised before it reaches the mirror, it will not be reflected. This means that if you use the simplest type of polarising filter on the lens – the linear polariser – the amount of light reaching the autofocus sensor will be reduced. If this happens, the autofocus system may not work, or at best will give unreliable or inconsistent results.

There can be a similar problem with the exposure sensors in the viewfinder area. The light reaching the sensors will be reduced, which means that the exposure readings may not be accurate.

These problems can be resolved by using a circular polarising filter. This is a linear filter with a 'quarter-wave' plate bonded to it. In simple terms, this plate 'stirs up' the light after it has passed through the linear filter, in effect giving it a circular motion.

This means that you gain the effect of polarised light, without the limitation of all the rays oscillating in the same direction (see right). A few of the rays will still be lost when they are reflected from the mirror, but the majority will get through to do their job. The autofocus and exposure systems should give reliable results.

Most polarising filters you buy today will be the circular type. If you are buying second-hand look for 'Circular', 'CPL', 'PL-CIR' or similar engraved on the filter mount.



Above Light can be thought of as a series of electromagnetic waves. These waves have peaks and troughs (oscillations), just like waves travelling in water.

Left Imagine that you are looking at this oscillating wave from the end, down the length of its travel. All you would see is a single line.



Left However, unlike waves in water, light waves oscillate in all directions, up and down, side to side and at all the angles in between.



Above A polarising filter acts as a grill, with long, narrow apertures (above left). It only lets through light waves which oscillate along the length of the apertures (above centre left). Light waves which oscillate at other angles are blocked (above centre right). This means that all the light waves which pass through the filter oscillate in the same direction (above right). This light is 'polarised'.

Light from certain parts of the sky and light reflected from non-metallic surfaces is already polarised before it reaches the camera. If a polarising filter on the lens is turned so that these oscillating waves are able to pass through, the filter has little effect. However, if the filter is now turned through 90°, most of the polarised light will be blocked. This will, in effect, cause selective underexposure. Blue sky will become darker, giving a more vivid colour. The light from clouds, however, is not polarised and will remain the same brightness.

With the polarising filter turned to the optimum position, reflections will virtually disappear because the light which is creating them will no longer pass through the filter. The rest of the light from the subject is non-polarised and most of it will pass through to form a clear image. The fact that some of the light is blocked by the filter explains why an increase in exposure is needed when a polarising filter is used, and why this increase varies with the rotation of the filter.

Important note The above explanation of how a polarising filter works has been simplified for ease of understanding. This is to say that scientifically it is incorrect. All the interaction takes place at electron level and involves, among other things, out-of-phase beams cancelling each other out. The direction of the polarised light is also perpendicular to the filter grid. Our explanation has its flaws, but works if you keep your distance.

Polarising filter test

How do you know if you have a linear or circular polarising filter? If there are no markings on the filter mount, try this simple test.

Hold the polarising filter in front of a mirror, first with one side of the filter towards the mirror, and then the other side. If there is no change in the tone of the reflection, you have a linear filter. If there is a change in tone, you have a circular polarising filter.

When the reflection is the lightest, the side of the filter closest to you – that is, not facing the mirror – is the side that should face the front lens element as you screw it into the lens filter mount, or attach it to the lens with a holder.