Windows, bl**dy windows … a bit more

By John Rossetti

Since writing the first part of 'Windows, bl**dy windows' (Zerb 65, Spring 2007) some time has gone by and, more importantly, so has IBC – and it was at IBC that I spotted a useful new size of linear polarising filter to help the light balancing problems associated with lighting subjects against windows.

As an aside, this new product will also deal with most of those annoying reflections off various surfaces. 'Ah,' some might say, 'I already use a Polaroid filter to reduce reflections.' Yes, indeed you might (more on that later), but a single Polaroid filter on its own – and it may well be a circular polariser – will not be a lot of help when balancing differing interior/exterior light levels through windows. So, cue IBC and RoscoVIEW. It has taken some time to get samples but at last …

The technical bit

To understand what is going on, it's best to first think of light as being similar to radio waves. UHF television radio waves are picked up by an aerial with lots of little elements sticking out. Depending on where you live, these elements will be either horizontal or vertical and it works because the television transmitter aerials are polarised so that one channel does not interfere with another.

Well, it's the same with light, except that sunlight, in common with most other light sources, is naturally unpolarised, so if we are lighting a subject with unpolarised light and battling with more unpolarised light coming through the windows, it follows that we may be able to control these sources individually and let the lens only see proportions of each source.

In addition to wanting to control the various levels of light from the different sources, we may also want to combat reflections bouncing off the windows from our own lighting.

So, how does it all work in practice?

Here is a beam of unpolarised light …

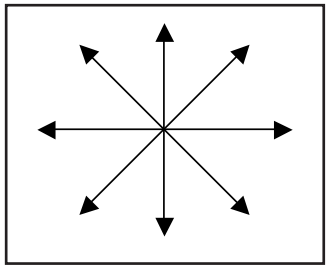

Figure 1

… and here is a nice beam of light that's been polarised:

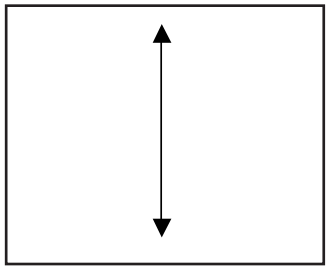

Figure 2

How to achieve the ideal of Figure 2 from Figure 1? Use a 12 bar gate!

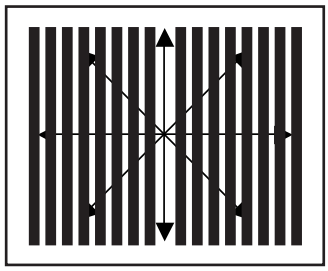

Figure 3

The 'gate' turns out to be a linear Polaroid filter.

Likewise, if you use two Polaroid filters at 90° to each other, you get …? Nothing … Take my word for it!

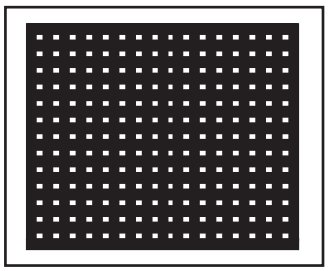

Figure 4

The problem

So, we have all had to do it … we have a set-up that comprises a couple of lamps frontlighting a subject against a window with the outside scene illuminated at a different (usually higher) level thanks to the daylight outside (for the purposes of this article, I will assume you have dealt with the differing colour temperatures by using HMI/MSR heads or a daylight [blue] filter) (see Figure 5).

In my first article, I looked at the traditional ways of balancing the exterior light using ND filters, 0.3, 0.6, 0.9, etc. This works fine but, as we all know, the light levels outside have a nasty habit of changing, usually as the direct sunlight varies or some other aspect of nature changes the ambient levels.

During the shoot, as the natural light changes, the effect will necessitate stopping and adjusting something, and if you're working against the clock, it's often just not possible,

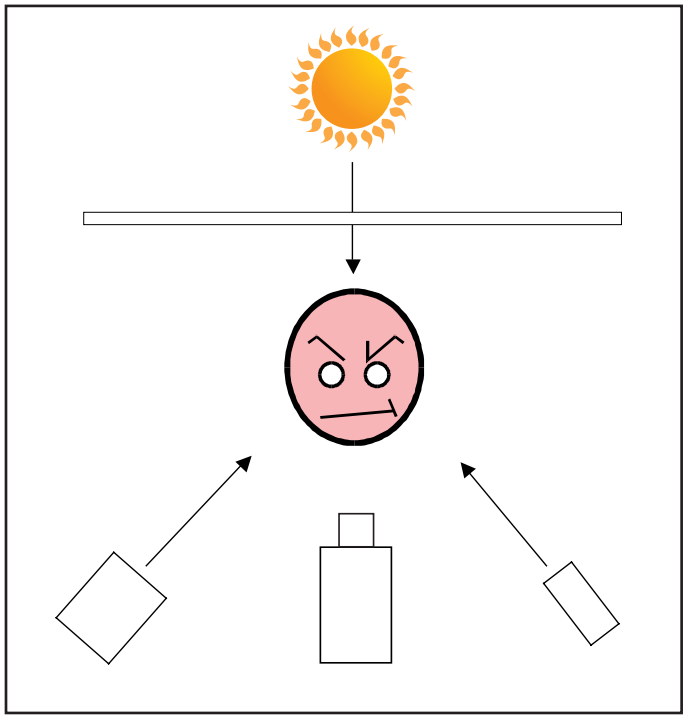

Figure 5

so you plough on and just let it all burn out or even underexpose. What is needed is a more fluid (and handy) way of controlling the two main sources – the exterior and the interior lighting. The interior is reasonably easy; you can use dimmers, for instance, but that then introduces colour temperature changes.

This is where the interaction of two Polaroid filters, as illustrated in Figure 4, can be used to our advantage.

Polaroid, or polarising, filters are not new; they are often used by photographers in front of the camera lens to reduce reflections from surfaces such as glass or water and they are also used to enrich the colour on landscape or other outdoor shots.

The downside of these filters though is that they are expensive; a 6 x 4 camera filter is about £200 and a window roll (48cm x 3m approximately £300). Also, they reduce the available exposure by 1½ stops.

So, Rosco have come up with RoscoVIEW (standing for Variable Intensity and Exposure on Windows). This new linear polarising filter is available in sheets and rolls, current sizes being 1.42m x 2.44m rolls or 1.42m x 1m sheets and it only reduces the light by 1 stop. It will be available from June 2008, but at the time of writing prices are not known.

Time out

Earlier, I mentioned linear and circular polarisers, and no doubt some of you might be asking what the difference is. Well here, if you really want to know, is an explanation.

Linear polarisation

Linear polarisation commonly occurs in nature when light is reflected off a surface, such as a building wall or a river.

Reflected light is often polarised at the angle of the surface from which it is reflected. If this is the surface of a river, the light will be polarised horizontally; if the reflector is a vertical wall, the light will be polarised vertically. A linear polarising filter allows only light that is oriented a certain way to pass through (see Figure 3).

Circular polarisation

Circular polarisation is similar to linear polarisation except that circular polarisation is a combination of two perpendicular linear waves that are 90° out of phase with each other.

The construction of a circular polarising filter is the same as a linear polariser but with an additional layer that converts the first layer of linear polarisation to circular polarisation. A circular polariser is able to block all light waves rotating in one direction while allowing those going in the other direction to pass. It is important when using these filters to make sure the correct, linear, surface is pointing forwards and is in front of any other filters being used. A circular polariser restores the natural 50/50 vertical/horizontal balance of polarisation, without affecting the initial pictorial result.

It should be remembered that Polaroid filters will have an effect on through the lens metering and also auto-focus. Circular filters have less of an effect on automatics, but are not used in the context of this article.

Brewster's Angle

Note, the ability of polarising filters to reduce reflections is subject to a rule.

It is called Brewster's Angle, named after the Scottish physicist. In practice, it means that light being reflected from varying angles will be more or less affected by the use of a Polaroid filter; the critical angle is roughly 53° and varies slightly depending on the nature of the material the reflection is from.

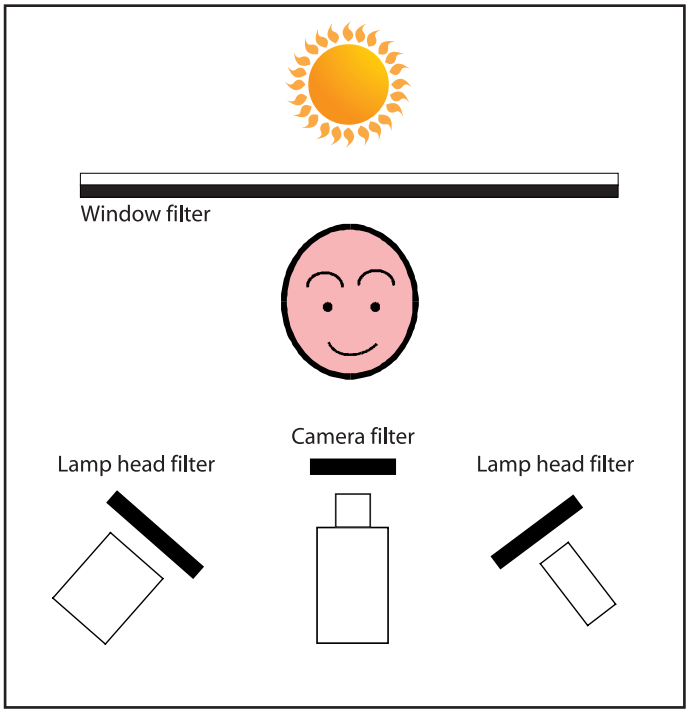

Figure 6

Application

So, let's expand on Figure 5, this time with areas marked where a polarising filter could be used (Figure 6).

Effects of the filters

- The window filter on its own will reduce the light coming through the window slightly (1 stop) but little else.
- The camera filter on its own will reduce all the light the camera sees and it may also reduce an odd reflection or two, but more by accident than intent.
- The lamp head filter on its own will slightly reduce the light output, but little else.
- With the window and camera filters in position and by rotating the camera filter, only the light coming through the window will be reduced.

(At this point it should be advised that if this method of control is going to be used, and there is enough available light for your desired exposure, set the rotation so that you have latitude in both directions; in this way you have room to compensate for the exterior light increasing OR decreasing.) With the window, camera, and light filters in place, full control can be had over exterior exposure, as described above, and by rotating the lamp head filters, their effect on the subject as well.

Careful placement and rotation of all three, if practical, will enable exposure compensation of the exterior and the interior lighting individually and will also allow the reduction of some or all of the reflections on any surfaces outside as well as some or all of the reflections of your lights that may be in shot on the window.

Top Tips

1. When you compose a shot that includes an LCD screen, a single Polaroid filter on the camera will reduce the brightness of the LCD right down to black if required.
2. Reflections on wet roads and glass can also be reduced by a camera Polaroid (or created if photographing through toughened glass).

Photo 1
The effect of a filter only on the left pane of the picture. Incoming light will be reduced by about a stop.

Photo 2
The effect of a filter only on the camera. Light will be reduced by about a stop and if the filter is rotated may reduce/increase reflections outside the window or from the surface of the window.

Photo 3
The effect of a filter on the window and the camera 0° – 0° axis. Light loss 1 stop off the subject, 2 stops off the outside light.

Photo 4
The effect of a filter on the window and the camera 0° – 45° axis. Light loss 1 stop off the subject, 4 stops off the outside light.

Photo 5
The effect of a filter on the window and a normal Polaroid filter on the camera 0° – 90° axis. Light loss 1 stop off the subject, 4 stops off the outside light but also turns outside blue.

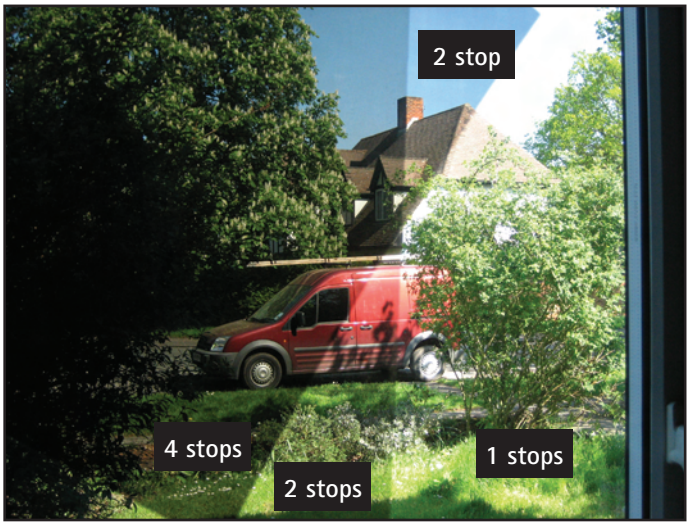

Photo 6
The effect of one stop per filter layer on sky and grass.