In this exercise we will photograph glass in two different ways.

In our first example we will photograph glass against a plain white background in such a way that the glass has a black outline only. We will see nothing else, only the glass black outline.

Then we will reverse this exercise and photograph the same glass against a black background, and have the glass outlined as a white outline against the black background.

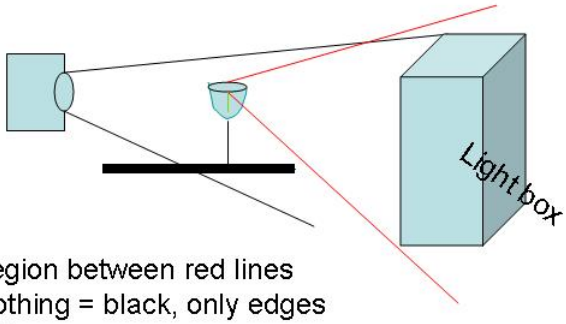
This exercise illustrates the refraction of the glass, and how we can use reflections to make things white or black. Basically, it is very simple once we apply some very basic logic. Black represents nothing, black represents an absence of light. So if you want a white background and black edges of the glass, we set up the following:

In an ideal situation we use translucent opaque white Perspex, and the place the glass at the very back edge of the Perspex. Some distance behind the Perspex table we position a small oblong soft box.
Now we position the camera in such a way that we are just slightly above the glass, this way we can see the glass is round because we can look at the top of the glass and see an oval shape at the top. (4x5 camera users can keep the lens plane and film plane parallel to the stem of the glass so that they can look down without creating perspective distortion)
Our camera position dictates now that we look slightly down so we have the light box a little below the level of the Perspex to create an even white background. In this position you will now see a clear glass with black edges.

Why? Okay here is my explanation and I will illustrate this later in a diagram as well because it is not easy to explain. Light travels in a straight line, and of course the soft box scatters the light in all directions but all the light comes from the back towards the glass. However the edges of the glass facing the camera lens do not only face forward, they curve away towards the black edges of the light in the background.

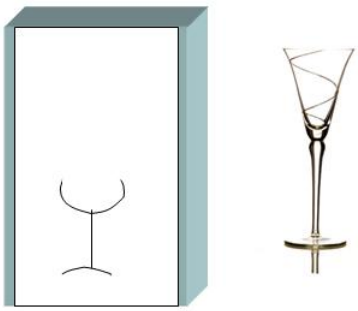
Between the camera and the light box is no light, therefore the glass cannot pick up any reflections or light, and therefore reflects nothing. Remember nothing is black, therefore we have a black outline.
A diagram will show this quite graphically (see next page). Not everybody will have a small light box that is the size of a shoebox, but that is what I used. Most of us have light boxes that are quite a lot bigger. The only way to create this effect with a black outline on glass is to make your light box smaller so it is slightly bigger then the object you want to photograph with a black outline. Cover your light box with black paper or material until you end up with only a small white opening, slightly bigger then your glass so it fills your viewfinder with a white background.

If you have unlimited space, you could use a big soft box and position it very far away from your Perspex table, the light box becomes smaller as it moved away from the glass. You will see the edges of the glass becoming more black, or thicker, as the light box moved further away because the edges of the glass do not pick up any reflection of the light box behind it as it moved further away and therefore reflects nothing equals black.



The camera looks "through" the glass at the lightbox – you photograph the light box at F16.5, it measured F64 in reflected mode, this meter reading is valid for both…!

The big region between red lines reflects nothing = black, only edges show black



Frontview for black edges

Frontview for white edges

How do the light meter this situation? I prefer to take in this case contrast readings, and the best way to take a contrast reading is in the reflected mode. In the reflected mode I pointed my spot meter towards the light box from the

camera lens position and measured the light output from the light box. In this case I got F64.
If I put this aperture on my camera lens I would get a grey light box, 18 percent grey reference. I want it white, therefore I open my aperture three stops plus, so my aperture that I put on my camera is between F16 and F-22. This will give my glass a white background.

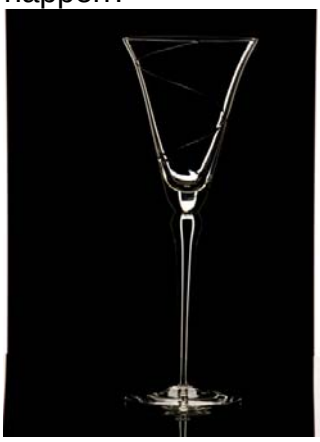
This is possibly the most accurate light metering method, but if you do not have a spot meter, you can use an incident light meter reading when you place your light meter with the dome over the lens of the light meter in the same spot as where the glass is standing, just point it towards the light box and take a light reading. Theoretically you should get a similar, or very similar aperture as the spotmeter reading. If you have a digital camera, you will have instant feedback wether your metering method is correct or not.
You may ask why the black edges of the glass look thicker black than the top edge of the glass. As the eye looking at the actual edge of the glass, it is a lot thinner than the actual site edge of the glass, we are not looking at the specific thickness of the glass in millimetres but at a roundness, and that is a lot thicker at the edges than just the actual physical edge of the top of the glass. Two obtain the maximum blackness on the top of the glass and ensure that there is as little white background above the glass as possible, the more white light reflected of the top of the light box onto the glass will make the black edge on the top thinner.
To get the hang of this exercise, place the little light box a little closer to the glass and moving further away to observe the effect of the light box and the black edges.

This technique is very useful if you want to photograph liquids in a glass, just use the same light meter methods as you did before, you will see the liquid exposed correctly. See the other photographs!

I did not change anything. Even if you move the light box further away or closer to the glass, the exposure stays the same. Remember you are exposing the light box, you have measured the emission of light from the light box, a you are looking through the glass at the light box so, wherever that light box is positioned, the light output of the light box is the same, so one light reading is sufficient.

Let us now reverse the situation and photograph a glass with a white outline against a black background. In this case, all I did was place a black card over my light box, leaving only a very small edge on the left, on the right, and on the

top of the light box uncovered. I did not change anything else the same light reading and I got a white outlined glass with a black background. So why did this happen?



In our first example we photographed the edges of the glass, in other words we photographed the absence of light. Now we have reversed that situation, the edges are actually reflecting the edges next to the black card on the light box, and therefore we have a white outline.

Again, the distance of the light box away from the glass will determine how thick or thin the edges of the glass will be. If you have very thick or wide edges left on your light box, so in comparison to your black background there is quite a lot of white light box showing, your white edges will be quite thick. If you have very thin white edges left on your light box, you will have very thin white lines on your glass. Experiment with both the distance between the light box and the glass as well as the wite border around your black cardon the lightbox, to find out a nice equilibrium that pleases your eye. If you have to light meter this situation, aim your spot meter at the black card, and close down your aperture three stops below the reading that your light meter gives you. If you do not have a spot meter hold your light meter in the incident light meter mode at the position of the glass and aim the diffusor towards the black card. Use that light meter reading as your aperture setting on the lens.

Enjoy ths play with light, below a few more samples….
You can see the lightbox's edges…..

Image on right:
Yellow and blue bottle shot on black Perspex, all other "white" shots on white translucent perspex

Lightbox further away = thicker black edges

Image on right – I placed a black card over light box you can see the white “sripes” of the lightbox on the left and right.

Real big black edges, see where? That is refraction for you….

image on right: yellow and blue bottle overlap = green

Enjoy your glass - Prosit!

Email me at hotshot@ihug.co.nz for feedback or other articles!