

Lens Talk:

Macro: The World Close Up
(Talk #5)

10/11/2008
New Westminster Photography Club
Keith Griffiths

Macro *or* The World Up Close

There are plenty of options to enable you to photograph the world up close and as usual the options range in price from 'not too bad' to 'ouch'. Here is a list some common methods starting from the economical end of the scale and going up. Within each of these options there is a range of prices and qualities and the quality of the results often varies in proportion to the price.

1. Close up filters or Dioptres
2. Extension tubes
3. Macro lenses
4. Reversing rings
5. Bellows units with standard lenses
6. And then you can start combining the above.
7. Then you can go the Microscope route with a camera adaptor.

I have tried and will illustrate the first 4 methods.

I priced out several options recently.

The price of Close-up filters vary by manufacturer and size, a set of 3- 52mm diameter dioptres can be as low as \$10 on eBay for no name lenses from somewhere in China or as much as \$75 for some fairly good ones from local shops. 62mm diameter ones are +/- 25% more. These lenses come in regular single element screw on units or as double element corrected units, and yes the better quality 2 element ones cost much more (\$200-\$300 each)

Extension tubes can run from \$150 for a set of 3 Kenko units to \$150 each for ones that are made by your camera manufacturer.

Dedicated Macro lenses....well how much do you have to spend? \$500 used or \$1000 new for 100mm lenses and more for the longer focal lengths.

I bought a Nikon bellows for a little over \$100 on ebay but a new one can cost much, much more if you can find one.

This next segment is about magnification or 'how close do you want to get?'

I have heard that Macro photography starts at a ratio of 1:1, or that the size of the image on the film or digital sensor is the same size as real life. So when you print this image it can be very large indeed, a 4x6 print would be 4 times larger than life size. Following is a list of reproduction ratios for different lenses.

Lens focal length	reproduction ratio
24mm	1/9
35mm	1/4
50mm	1/6
100mm macro	1/1
70-300 zoom	1/4

All of the above are when the lens is at its closest focusing distance. Most of these create pretty small reproductions of reality on the film or sensor. The first step in recording a larger image is to try in effect a magnifying glass. Dioptres are just like magnifying glasses. They are often marked as +1, or +4, and the higher the number, the stronger the magnification. The down side to these is that they are often not sharp throughout the image. The centre portion of the frame is good but they become soft around the edges. The expensive double element dioptres are much better and are usually multi coated to eliminate chromatic aberration.

If you have never used extension tubes before or are unfamiliar with them, they are just empty hollow tubes that have the required camera mounts at each end. They usually come in a series or set, with an 8mm long, 15mm long and 25mm long tube. They have no glass in them and therefore will not degrade the resulting image. But by moving the lens further away from the recording device, they do cut down on the light reaching the film or sensor. I forget the little stuff about connecting extension tubes together but the basics are easy. If you add an extension tube between a lens and the camera body equal to the focal length of the lens it will create an image ratio of 1:1 on the film plane. For example 35mm of extension tube behind a 35mm lens gives a 1:1 image. Or 24mm of tube behind a 24mm lens does the same thing. If you follow the pattern here then you would need a very long extension tube between the camera and the lens if you used a 200mm lens. This is where a bellows comes in, you can adjust it to any length you need.

A 2x tele-converter can be added to the mix. If you add the tele-converter right behind the lens, you double the focal length of the lens. If you add it between the extension tubes and the camera body, you will double the length of tubes you have in place.

Next is a reversing ring. This is a really cool little device, it is like a filter adapter that screws to the front of your lens but it has the mount on the other side to fasten to the camera. So you can put the lens on the camera backwards, or inside pointing outwards. This may sound pretty strange but a 24mm lens on the regular way produces an image 1/9 life size but put it on backwards and it makes an image about 8-times life size. The down side is that everything is manual, focus, stopping down the aperture, metering....everything. You can fill the frame with a single drop of water.

Now you can start to combine things. The easiest to use is a dedicated macro lens, as everything can be run from the camera body, and on automatic if you want. Then you can add a dioptre to get closer and then add some extension tubes.

Following are a series of photos of and with the various items mentioned.

Lighting is always a problem with close-up photography. The depth of field is so shallow that you need to stop down to f16, 22 or more if you can and then subject motion and the long time exposures required with natural light are an issue. Flash helps with these problems by supplying a relatively large amount of light for a very short duration so the small f-stops and subject motion are easy to deal with.

The equipment: 24mm lens, reversing ring, set of three 52mm dioptres, Nikkor double element dioptre, Kenko extension tubes, Nikkor 105mm macro lens, two flash units.



Figure 1: 24mm lens



Figure 2: 35mm Lens

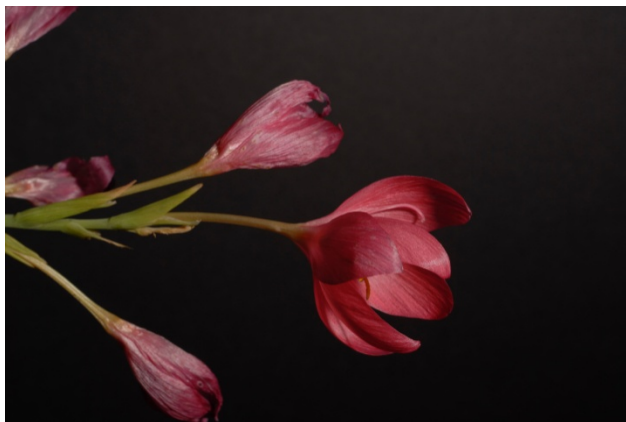


Figure 3: 35mm Lens and dioptres



Figure 4: 35mm Lens and extension tubes



Figure 5: 35mm Lens and extension tubes (different angle from Figure 4)



Figure 6: 35mm Lens, 36mm Extension tubes and +3, +2, +1 dioptres stacked up



Figure 7: 105 Macro Lens



Figure 8: 105 Macro Lens plus dioptre and 35mm of extension tube

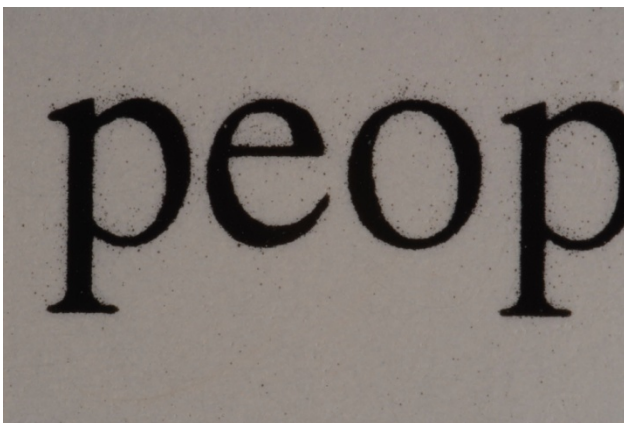


Figure 9: 24mm Lens with reversing ring