

Inon UCL-67

by Phil Rudin

Founded in 1994 Inon Inc. is a Japanese company which is well respected in the underwater photography world. I am sure many UWP readers have already been using Inon strobes, wet lenses, LED lights or any the hundreds of other products Inon offers.

The Inon UCL-67 (underwater close-up lens) is designed to deliver high magnification with superior image quality across a board range of camera bodies.

Best suited to full frame DSLR macro lenses in the 60mm to 100/105mm range the lens can also be used with 40mm to 60mm APS-C macro lenses and 45mm to 60mm Micro Four Thirds lenses. The lens is also well suited for compact digital cameras having a maximum optical zoom of 5X or less.

As with all close-up lenses vignetting may occur if the close-up lens is place to far from the primary lens. Vignetting is observed most often when the macro lens sits to far back from the port glass or a flip adapter is used that moves the C/U lens to far away from the primary macro lens.

The closer the two lenses are to each other the less vignetting and the



greater the magnification.

The UCL-67 lens is available in the M67 series which has standard 67 mm threads for direct mounting to a macro port or flip adapter. The UCL-67 28LD series has the lockable Inon 28LD mounting base for use with a verity of compact camera housings. The 28LD series is designed to allow a quick change between wide angle and close-up lenses.

Corrosion resistant aluminum alloy is used for UCL-67 and 28LD series. The lens is designed with four optical glass elements in three groups and has lens coating on both sides. The use of achromatic lens element suppresses chromatic aberration and the addition of an anti-reflective lens coatings reduces ghosting and flare.

The UCL-67 is depth rated to 60m (197ft) and has a maximum magnification of +15 diopter. Diopter (US) is a unit of measurement for the optical power of a lens. The higher the number (in this case +15) the greater the lens power. At the minimum



Coral Polyp Detail, Olympus EM1 II, Olympus 60mm macro lens at 1:1, Ikelite Housing, ISO-200, F/7.1, 1/250th sec.

focusing distance of (1:1) with a Nikon 105mm F/2.8 IF-ED lens working distance from this C/U lens is about 52 mm or 83.4 mm from the port surface. On a full frame camera body the magnification would be 2.76X at the minimum focus distance.

The optional "Lens Adapter Ring" for UCL-67 allows a second m67 close-up lens like the Inon UCL-165 M67 or UCL-330 to be mounted on the front of the UCL-67 for even greater magnification.

Wet close-up lenses are quite popular with underwater macro



+15 Inon UCL-67 M67

photographers for obtaining images with magnification beyond the 1:1 (life size) produced by most of the modern macro lenses sold these days. To understand how wet closeup lenses will work with your macro photography equipment you must first have a reference point for the equipment you are shooting with. Not all image sensors are the same size and as a result images captured with a macro lens set at 1:1 will not all be the same image size.

The term 1:1 or "life size" represents a reproduction ratio where



Reef Urchin Detail, Olympus EM1 II, Olympus 60mm macro lens at 1:1, Ikelite Housing, ISO-200, F/8, 1/250th



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the subject you are photographing is the same size on the image sensor or film plane as it is in real life. So if you have set your macro lens to 1:1 and you take a sharply focused photo of a subject which is 20 mm in length then it should take up the same 20 mm's on the image sensor or film plain.

If you are using a camera with a 35 mm "full frame" sensor like the Sony A7R II where the sensor size is 36 X 24 mm your subject should have about 8 mm of negative space on each side if the subject is centered and on a flat plane in the frame. With a 1.5X "cropped" sensor like the one in the Nikon D7200 the sensor size is 23.5 X 15.6 mm so at 1:1 the 20 mm subject would have about 1.75 mm on each side when centered.

With a Micro 4/3 camera like the Olympus OMD E-M1 II the image sensor is 17.4 X 13 mm and in this

case the 20 mm subject would be cut off by 1.3 mm on each side. The smaller the sensor the smaller the subject that will fully fill the frame with a macro lens set at 1:1. Smaller sensors also increase depth on field for a given angle of view and like F/stops. So a lens with a 24 degree angle of view on a 35 mm sensor at say F/11 will have less depth of field than a lens with a 24 degree angle of view on a M4/3 camera at F/11. Bottom line is that everything in photography is a tradeoff. Better overall image quality with a larger image sensor verses a much smaller critter filling the frame and better DOF with a small sensor camera.

I did not have access to a full frame 35mm camera for this review so all of the images are taken with a Micro/4/3 Olympus EM1 II camera and Olympus 60mm macro lens in

Ikelite and Nauticam housings. With a full frame camera and 100mm lens at 1:1 magnification is around 2.8:1 with the Olympus 60mm macro at 1:1 magnification is around 3:1 or an image of about 5.8 mm on the long side. This would be a subject about the same size as a grain of rice. Even with a small sensor Camera DOF is still very shallow and you need to work quite close to the subject.

Field testing the Inon UCL-67

I used the UCL-67 M67 threaded directly to the macro ports for both systems used for this review. All of the images were shot at 1:1 first without the lens and then with the UCL-67 for a size comparison. The attached images are all full frame without any cropping.

As with all macro photography subject selection is critical for successful results. Because of the very shallow DOF choosing a subject that can be kept in a relatively flat plain is helpful. Many animals like small fish just won't tolerate the limited working distance (less than 5 cm) between the C/U lens and subject.

You should have a working knowledge of super macro when using these lenses because you can very easily damage a subject by getting to close. These lenses are near impossible to use in a strong current unless you can hide behind something.

I found the more static subjects like corals to be the best starting point when learning to use a lens with this amount of magnification. The Olympus EM1 II with the 60mm macro has extremely fast AF with excellent AF accuracy. I found that keeping the lens set to 1:1 using back focus and then just adding the Inon lens and "rocking" the camera to focus worked better than trying to AF for every image.

I used F/7.1 and F/16 for many images so that the differences in DOF could be accessed. After over ten hours of use underwater I have not found vignetting to be a problem from F/7.1 or greater. This lens is tack sharp and I did not see any chromatic aberration with high contrast subjects. When stacking the UCL-67 with the UCL-165 the distance between lens and subject is very narrow, I would estimate around 5mm.

Getting light from the strobes on the subject will dealing with such a small distance is difficult and at times I needed ISO-400 to get enough light for a proper exposure.

If you want to test your Super Macro skills contact your local Inon retailer and try out this impressive lens. The Inon UCL-67 M67 retails for around \$375.00 in the US.

Phil Rudin

Don't settle for 2nd best



Film - No Filter No
White Balance



Digital - No Filter Manual
White Balance



Magic Filter Manual
White Balance

Digital cameras have opened up new possibilities to underwater photographers. For available light photography manual white balance is an invaluable tool for restoring colours. But when you use it without a filter you are not making the most of the technique. You're doing all the hard work without reaping the full rewards. These three photos are all taken of the same wreck in the Red Sea. The left hand image was taken on slide film, which rendered the scene completely blue. The middle image is taken with a digital SLR without a filter, using manual white balance. The white balance has brought out some of the colour of the wreck, but it has also sucked all the blue out of the water behind the wreck, making it almost grey. The right hand image is taken with the same digital camera and lens, but this time using an original Magic Filter. The filter attenuates blue light meaning that the colours of the wreck are brought out and it stands out from the background water, which is recorded as an accurate blue.

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