

Nauticam CMC macro lens

by Phil Rudin

DEMA, (The Dive Equipment & Marketing Association) show was held once again during November 2014 in Las Vegas, Nevada USA. Every November dive equipment manufacturers from around the globe meet for the United States largest diving event. Included in the show is a large image resource center dedicated to the art of underwater photography and videography.

The 2014 show much like past shows debuted many new and interesting products including Nauticam's new CMC Macro Accessory Lens, now shipping world wide which is optimized for Compact and Mirrorless cameras.

The Nauticam CMC Macro Lens is another excellent example of the fusion of advanced innovation, lens engineering technology and compactness that Nauticam has become known for.

Wet macro accessory lenses like the CMC are quite popular with super macro photographers looking to obtain image magnification beyond the 1:1 (life size) magnification produced by most of the modern macro lenses sold these days.

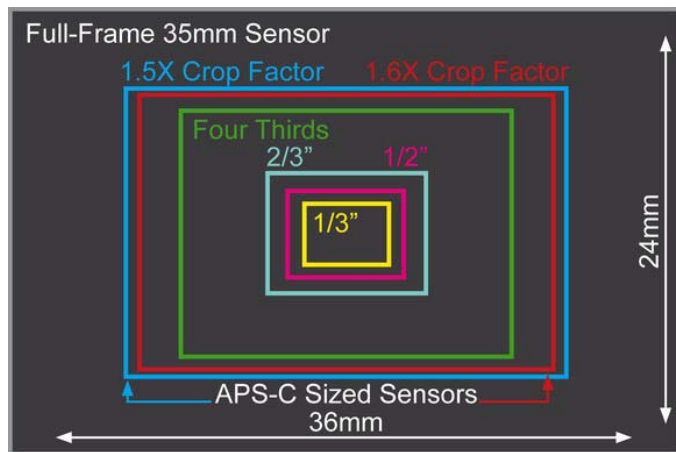
To understand how wet close-up lenses will work with your macro photography equipment you must first have a starting point of reference for the equipment you are shooting with. Not all digital image sensors are the same size and as a result the size of the images captured with a macro lens set at 1:1 will not all be the same size. So how do we define what is a 1:1 or "life size" still or video capture. The term 1:1 or "life size" represents a reproduction ratio where the subject you are photographing is the same size on the image sensor as it is in real life.

If you have set your macro lens to 1:1 and you take a sharp photo of a subject which is 20 mm in length then it should take up the same 20 mm's on the image sensor. If you are using a camera with a 35 mm "full frame"

*Juvenile Conch Eye, Olympus E-M5
ii, Olympus 60Mm Macro Lens, Ikelite
Prototype Housing, Iso-200, 1/320Th,
F10, Two Ikelite Ds-161 Strobes,
Nauticam Cmc, 2:1, Twice Life Size.*



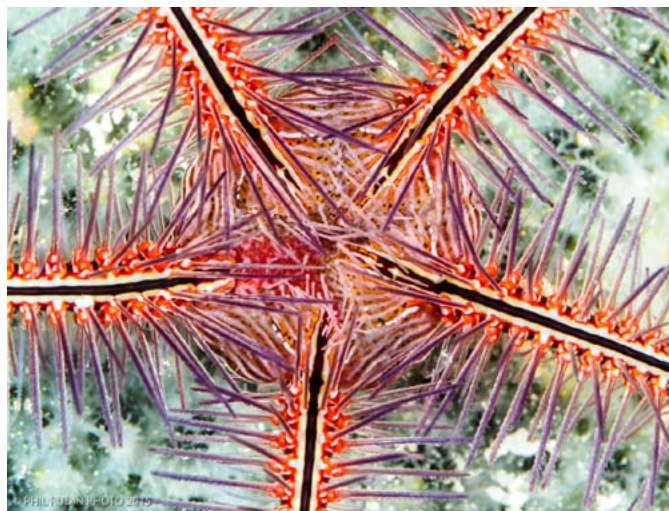
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sensor like the Nikon D-810 or Canon 5D MK III where the sensor size is 36 X 24 mm your subject should have about 8 mm of negative space on each side if the subject is centered and on a flat plane in the frame.

With a 1.5 X “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 of negative space on each side when centered. With a Micro 4/3 camera like the Olympus OMD E-M1/E-M5 II the image sensor is 17.3 X 13 mm and in this case the 20 mm subject would be cut off by 1.35 mm on each side.

Compact cameras sensor are even smaller but the fixed lenses don’t go all the way to 1:1. So 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 with 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



Without: Brittle Star, Olympus E-M5 II, Olympus 60mm Macro Lens, Ikelite Prototype Housing, Iso-200, 1/320Th, F10, Two Ikelite Ds-161 Strobes, 1:1, Life Size To Demonstrate Size Difference Without CMC.

35 mm image sensor verses a much smaller critter filling the frame with a small sensor camera.

When you add the Nauticam CMC close-up lens into the equation nothing changes regarding the physics of the sensor size. Using a M4/3 camera with the Olympus 60 mm macro lens and the CMC magnification goes from 1:1 to 2:1 or twice life size rendering an image 8.5 mm x 6.3 mm. This combination then becomes one of the most powerful in today's super macro market.

With the Panasonic 45 mm macro lens at 1:1 you get 1.6:1 magnification with an image 11 mm on the long side. With compact cameras like the Canon G-16 you get 1.6 X magnification with the CMC and go from a minimum image size of 30 mm to an image of 19 mm on the long side.

Other compacts like the new Canon G7X have



With CMC: Brittle Star, Olympus E-M5 II, Olympus 60mm Macro Lens, Ikelite Prototype Housing, Iso-200, 1/320Th, F11, Two Ikelite Ds-161 Strobes, Nauticam CMC, 2:1, Twice Life Size.

a 3.0X magnification rendering a 68 mm image width with CMC the image width becomes 23 mm. The difference in image size between Canon G16 and Canon G7X is the result of the larger sensor in the G7X.

Lenses like the Olympus 12-50 mm zoom and the Sony E 18-55 mm zoom also have increased magnification benefits when used with the CMC. Lenses like the Zeiss Touit 50 mm macro for Sony E-mount cameras like NEX-7 and A-6000 also increase in magnification from 1:1 to 1.5:1 with the CMC reducing image width from 23 mm to 16 mm.

What sets the Nauticam CMC apart from other closeup accessory lenses is the unique design. The CMC was inspired by the original Nauticam SMC (Super Macro Converter) for larger sensor camera and is even more powerful than its big brother.



Nauticam Cmc With Spacer Mounted To Ikelite Macro Port For Panasonic 45Mm Macro.

Current wet macro lenses basically use the same design approach as in air using diopter lenses which do not take into account the interface between camera, lens, air, port glass and water. The Nauticam engineering team headed by Managing Director Edward Lai has sought to design a new level of super macro lenses that complements this interface and elevates image quality to new heights.

Nauticam's new design places the rear element of the macro lens closer to the camera lens. Every millimeter of extra distance between the macro lens and the CMC reduces magnification.

The big news is that Nauticam's CMC design creates greater distance between the subject than that created by conventional wet macro lenses. With magnification of approximately +15 the CMC to subject distance at 1:1 almost doubles from around 12 to 15 mm to 22 mm using the M43 60 mm macro example.

While this extra distance may not seem



Nauticam CMC Macro lens on a Nauticam Olympus housing with their flip adaptor.

like much it is huge allowing more distance between fragile subjects and making lighting less problematic. The CMC also optimizes image quality over the entire focus range of the lens rendering excellent Bokeh in the out of focus areas.

At a length of only 34 mm I found the CMC quite compact and light at only 280 Grams (9.88 oz). In the field my test shots were made using an Olympus E-M5 II M43 camera with Olympus 60 mm macro lens and Canon G7X compact. The CMC worked well threaded directly to the macro port using the included spacing ring or with a Nauticam Flip lens holder.

The CMC did not work with my SAGA flip holder and does not work with the ReefNet flip holders because of the way the lens extended through the back of the flip holder to position the CMC closer to the port glass. My preference when using a lens with magnification like the CMC is to have a flip holder so that the lens can easily be



Juvenile Hermit Crab, Olympus E-M5 II, Olympus 60Mm Macro Lens, Ikelite Prototype Housing, Iso-200, 1/320Th, F20, Two Ikelite Ds-161 Strobes, Nauticam Cmc, 2:1, Twice Life Size.

moved in and of the frame. This allows me to focus more easily on a very small subject and then just flip the CMC in for even greater magnification.

Auto focus with the CMC was excellent, when I wanted to be completely sure that the lens had reached 1:1 I locked focus using the rear focus trigger or manual focused and "rocked" the housing in and out until I could see correct focus in the



Coral Polyps, Olympus E-M5 II, Olympus 60Mm Macro Lens, Ikelite Prototype Housing, Iso-200, 1/320Th, F16, Two Ikelite Ds-161 Strobes, Nauticam Cmc, 2:1, Twice Life Size.

viewfinder.

The CMC has 67 mm threads so you can stack additional closeup lenses, filters for video and so on. A lens with this much magnification on the M43 sensor requires proper subject selection and may at first be frustrating to entry level super macro photographers.

Depth of field is quite shallow with using lenses with this much magnification, so critical focus and camera control is paramount. For the uninitiated you may first want to familiarize yourself with the limits of your 1:1 macro or compact lens before trying to add magnification. I have had many students shooting with accessory macro lenses from too great a distance to their subject and then wondered why they weren't get better magnification.

Since a macro lens and compact shoots through



Candy Cane Lobster, Olympus E-M5 II, Olympus 60Mm Macro Lens, Ikelite Prototype Housing, Iso-200, 1/320Th, F20, Two Ikelite Ds-161 Strobes, Nauticam Cmc, 2:1, Twice Life Size.

the entire range from infinity to closeup I find little need for an accessory lens unless I want to go beyond the magnification already provided by the native camera lens. The CMC rendered very accurate color without the distortion or fringing problems associated some accessory macro lenses.

The CMC has a very robust construction and comes with an adapter ring for direct mounting to the port, caps for both front and rear glass elements, a very nice padded pull-string pouch with the Blue Nauticam logo and a Nauticam cleaning cloth along with the Nauticam product warranty.

The Nauticam part number is 81301 and the CMC retails in the US for \$320.00 and in the UK for £250.00 (inc VAT). I have used a wide verity of macro closeup lenses from a number of manufactures over the past forty plus years with SLR's, DSLR's, Mirrorless cameras and compacts



Hard coral, Olympus E-M5 II, Panasonic 45mm macro with Ikelite yellow filter on the macro port, Ikelite prototype housing, Ikelite DS-161 strobes with Dichroic filters, two Ikelite Vega video lights with Dichroic Filters, Nauticam CMC at 2:1, ISO-500, F/9, 1/400th, precessed in LightRoom.

using macro lenses from 30 mm to 200 mm and this is without question the best accessory closeup lens I have used to date. It provides a great deal of magnification for super macro and the increased distance to subject has added to my success rate.

The CMC is also a bargain compared to others in its class including the SMC. If you are shooting a mirrorless or compact camera you won't find a better option in todays market. The CMC also works with the Nikon 60 mm giving 1.5:1 magnification.

Phil Rudin

Phil Rudin is the Professional Photo Instructor for the MexicanDiver's event, Underwater Digital Fiesta held in Cozumel Mexico in April 2015.

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