Nauticam MFO-1

by Byron Conroy

There was a time in underwater photography when adding a new lens was the best way to introduce variety into your portfolio. However, in recent years—primarily due to Nauticam—we've seen the rise of water contact optics. These are additions to existing lenses that can alter their optical characteristics. Macro diopters like the SMC-1 and SMC-2 brought unprecedented magnification and image quality. Then came a wave of more complex wide-angle water contact optics, such as the Wide Angle Conversion Port (1 and 2) and the newer Fisheye Conversion Port, which transformed wide-angle zoom lenses.

In the macro world, the SMC-1 and SMC-2 initially allowed for incredibly unique shots. But as a dedicated macro shooter, I found myself using these lenses less and less. They aren't particularly versatile, with a very limited range of subjects they work well for. I began gravitating toward weaker alternatives, such as the Kraken +6, which proved far more useful. It allowed me to shoot a wider variety of subjects and was easier to use thanks to its greater working distance. As a result, I even started leaving my SMC behind on many macro dives.

In the last quarter, Nauticam released a new water contact optic for macro—the MFO-1 (Midrange Focus Optimizer). I've never seen a lens generate so much confusion upon release. This was partly due to Nauticam's slow and somewhat secretive rollout of information, but also because the lens does something we haven't really seen before, making it tricky to understand.

So What Is the MFO-1 and Where Did the Idea Come From?

Coincidentally, around the same time, two conversations took place—one between Edward Lai (Nauticam's owner) and Ryan Canon of Nauticam USA—where they discussed the impact of water contact optics on image quality. They explored how these optics reduce the aberrations caused by flat ports and macro lenses when used underwater. The idea was to develop a non-magnified optic that would eliminate these aberrations and improve overall image quality.

In 2023, Alex Mustard proposed the idea of a lower-powered diopter to Edward Lai. Unlike the much stronger diopters already in use, this one would simply allow photographers to get a little closer to their subject without the extreme

The lens allowed me to make this tiny pygmy seahorse a nice size in the frame and create a super sharp and easy to focus shot.

You can get super close to subjects such as this jawfish and generate high quality images without noticing you even have the lens on

The focusing is a dream for free swimming macro shots that are moving in and out of the shot and towards and away from the camera such as this blue ringed octopus.

magnification.

From this idea, the MFO-1 was born. Several prototypes were developed, each with slightly different optical power, until the version we have today was finalized. The lens does provide a slight magnification effect, ranging between 1.2x and 1.6x depending on the primary lens it's paired with. However, this "magnification" is achieved by altering the focal distance range rather than traditional optical enlargement. When using the MFO-1, the minimum focus distance is reduced—but only slightly.

In essence, the MFO-1 allows you to get closer to your subject while still maintaining autofocus, making it highly versatile for a wide range of subjects. At the same time, it doesn't prevent you from capturing macro shots as you did before. On a full-frame camera, the focus distance range with the MFO-1 is approximately 1 meter to 10 cm (3.3 feet to 4 inches).

This is why many people find the lens difficult to understand—it doesn't drastically change how you shoot, but it provides just enough of a shift to make a big difference. The subtle adjustment in focus range also eliminates focus hunting, allowing the camera to lock focus more quickly. Additionally, it corrects the optical aberrations inherent in traditional flat-port and macro lens setups, ultimately enhancing image quality.

How Does the Lens Perform In the Real World?

On my camera, I'm using the Sony 90mm macro lens. When paired with the MFO-1, the focus distance range shifts to 106mm–1082mm (10.6 cm–108.2 cm or roughly 4.2 inches–3.6 feet). This means I can now get as close as 10.6 cm (4.2 inches) to my subject, whereas before, the minimum distance was around 28 cm (11 inches). At the closest point, this gives me a 1.2x magnification. While that magnification may seem modest, it's far from insignificant—it's incredibly useful for smaller subjects that I want to fill the frame just a bit more, without resorting to the extreme magnification of the SMC.

The best way to describe using the MFO-1 is that you can leave it on for nearly all of your shooting. You don't notice it's there, and you don't notice it's doing anything—until you need it. Then you can simply take that extra step forward.

This shift in focus distance is

particularly helpful in less forgiving water conditions. Cold water macro shooters, in particular, will find this beneficial. The MFO-1 helps produce much cleaner images in situations where you previously would have struggled to achieve sharp, high-quality results.

The focusing performance of this lens is excellent—very impressive, in fact. In my experience, many macro shooters struggle with focus hunting simply because they don't start at the right distance when bringing the camera up to their eye. Often, they're too far or too close to the subject and then rely on autofocus to "find" it, rather than positioning the camera at the correct distance or gently moving it in and out until the subject comes into focus before engaging autofocus.

For me, using this lens was effortless, and it might actually help reduce focus hunting for those who struggle to establish the right starting distance.

The autofocus speed of the MFO-1 is also remarkably fast. I had no trouble using it to track animals swimming across the sand. When using single-spot focus on the eye, the autofocus consistently nailed the subject. Holding the shutter halfway down to track movement worked flawlessly, allowing me to wait for peak action and capture the perfect moment.

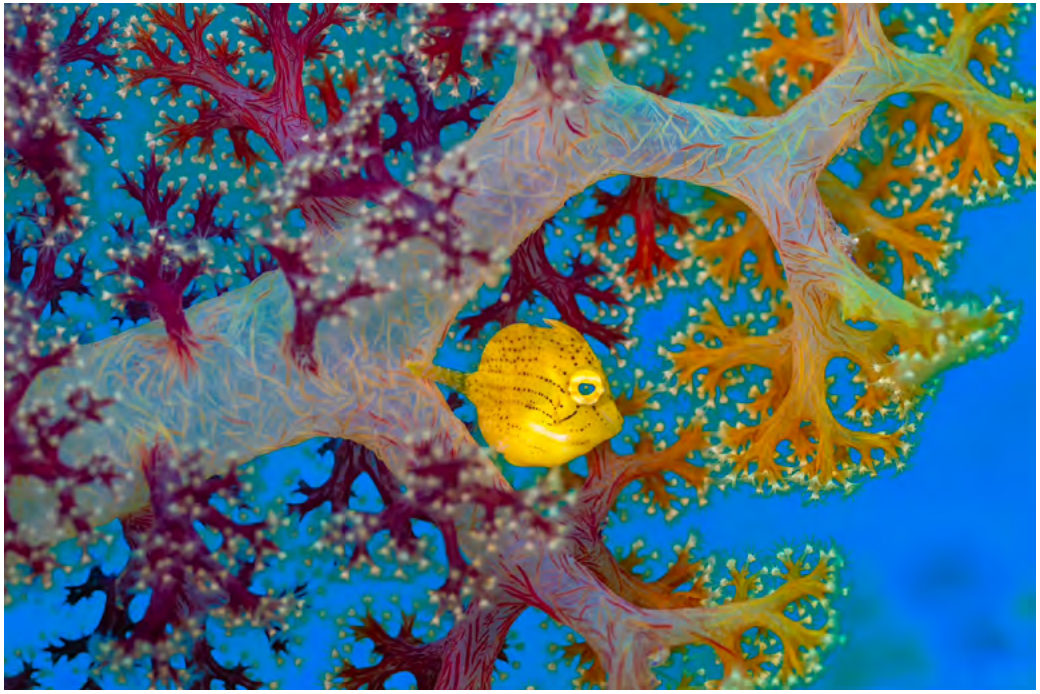
In terms of image quality, the results are sharp, clean, and crisp. I was able to capture some of the clearest portraits of small marine life I've ever taken. This is due to both the improved optical quality and the reduced amount of water between the lens and the subject.

The pygmy seahorse shot below was particularly tricky to capture, but the MFO-1 allowed me to get just a little closer than usual, making the subject slightly larger in the frame. It also let me rely on the camera's standard autofocus while actually making focusing easier than normal. The final image is razor-sharp and has a unique quality that wouldn't be possible with either no MFO or a stronger diopter.

Mounting the Lens

I've seen many people using flip diopter holders, but I don't recommend them at all. With the increasing number of diopters and other attachments in use today, they're simply not practical. They also interfere with lighting, add unnecessary weight to the front of the camera, and throw off its balance.

For me, the new Nauticam Bayonet Mount is the way to go. This system allows diopters to be quickly attached and released from the front of the port. I keep all the accessories I want to attach to my macro port—such as the SMC, Vortex filters, ND filters, and the MFO—on bayonet mount adaptors in my pocket, making it easy to swap them out quickly underwater.



A shot from the MFO-1, allowing for a sharp crisp and easy to focus image

To use this system, you'll need to buy the bayonet mount and leave it permanently attached to your macro port. Then, purchase as many bayonet holders as you need. I use three since I never take more than that amount of accessories on a dive.

Final Conclusion

This lens will no doubt be highly sought after. Priced at $475 USD, it's a bargain compared to most underwater photography gear. Within the next year or so, it's likely to become a staple on many high-end macro setups.

What makes the MFO-1 special is that it enables you to capture images you couldn't before—without even realizing it's doing so. It enhances your macro shooting experience by making focusing faster and easier while delivering cleaner, sharper

A new take in magnification of a pygmy seahorse, easier to focus and shoot than every before

images by reducing optical distortions and minimizing the amount of water between the lens and the subject. Yet, the magic of this lens is that it works so seamlessly that you might not even notice what it's doing.

It's a fantastic lens—versatile, practical, and one that will undoubtedly improve both your shooting experience and your results, even if you can't quite put your finger on how.

A big thanks to Edward Lai, Ryan Canon, and Dr. Alex Mustard for bringing this optic to the underwater photography world.

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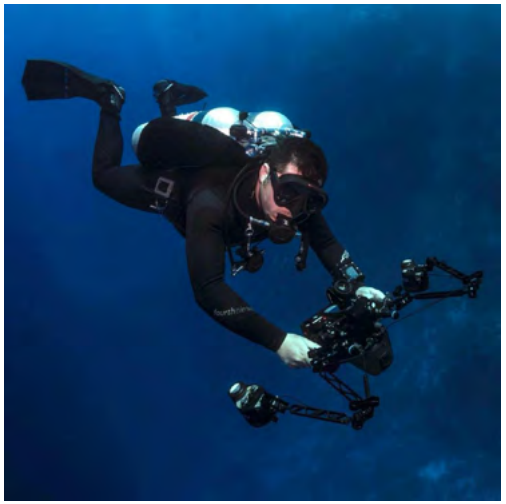

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