

Laowa 10mm Lens

by Phil Rudin

Venus Optics manufactures premium lenses for both still and cinema cameras under the Laowa Lens brand. Since 2013 Laowa with headquarters in China have produced a verity of unique and affordable lenses from small fisheye lenses to mirrorless macro lenses with up to twice life size (2:1) magnification.

Laowa lenses also cover formats from Micro 4/3 to the world's widest native lens for medium format and every thing in-between. Laowa lenses are produced for SLR, DSLR and mirrorless systems with unique lenses like the 24mm probe lenses, 2.5 to 5 X ultra macro, Anamorphic cine lenses and adapters plus much much more.

The Laowa 10mm Lens

To celebrate Laowa's tenth anniversary they have introduced their first auto focus lens, the 10mm F/2.8 Zero-D full frame lens with a remarkable ultra-wide 130.4 degree rectilinear angle of view. In addition this lens has a minimum focus distance of just 12cm (4.72 inches) while maintaining a weight of only 420g (0.925 pounds).

The lens can be used with 77mm

thread-on filters and is available in auto focus for Nikon Z and Sony FE using a five-blade aperture.

The lens also comes in manual focus for Canon RF and L-mount cameras in five-blade and fourteen-blade variant. In addition to being light weight the lens is also small at only 82 X 72.8mm (3.23 X 2.97 inches) and comes for the first time in an attractive purple/blue flat gunmetal finish with a dark blue accent band near the front of the lens.

The lens also includes a very small removable sunshade, a wide gnarled focus ring that is focus by wire, turns very smoothly and includes an AF/MF switch. The lens does not include image stabilization which is handled in camera via IBIS.

Lens construction is metal with a substantial metal mount that includes a weather sealing gasket. All metadata carries over from the lens in my Lightroom program and my production lens showed the lens as a 10mm not an 11mm which had been reported with some early 10mm lens model tests.

Prior to Laowa's 10mm auto focus lens to achieve a 130 degree AOV most underwater photographers



were using water contact optics with a maximum 28mm land lens to get the same 130 AOV. The WCL lenses are fisheye not rectilinear and are not well suited for split images because most are designed as water contact optics only.

The Laowa 10mm because of



its very short 12cm minimum focus distance from the camera sensor can be used in many port sizes from 140mm to 230mm and beyond. At the 12cm minimum focus distance the lens has a 1:4 reproduction ratio and

with a maximum aperture of F/22 this lens is ideal for shooting splits with minimal distortion.

Unlike most fixed lenses in the 14mm range or zooms like Canon RF 10-20 F/4 or Sony FE 12-24 the Laowa 10mm allows you to use thin 77mm graduated natural density filters for splits to make the transition from water to air more evenly exposed.

The Canon RF 10-20mm F/4 would be the closest AF lens with the 130 degree AOV, the downsides with the Canon lens is that it has a minimum focus distance of only 25cm more than twice the Laowa 10mm, it has no filter thread but accepts rear filter gels and it retails for \$2299.00 versus \$799.00 in the US for the Laowa.

The lens ships in an attractive storage box and includes a very small lens manual with extremely small print. An on line PDF manual for the lens would be appreciated.

The Laowa 10mm F/2.8 Zero-D is engineered with exceptional optics, featuring 15 elements in 9 groups, including 2 aspherical glass and 3 ED glass elements alone with a Frog-Eye coating on the front element. This results in outstanding image quality capturing excellent detail even when paired with a high megapixel camera like my Sony A7R V which was used exclusively for this review.

The Zero-D badge refers to lack of distortion both in the center of the frame and in the corners making a significant leap in sharpness over the admired Laowa 12mm F/2.8 Zero-D manual focus lens. As we are all aware in underwater photography port selection and extension lengths dictate the ability of any rectilinear to preform at its best underwater. It is simply not physically possible to achieve the same standards of performance from a lens underwater as it is above water so different



ports and extensions present different compromises to overall IQ across the frame. I will get into my port and extension selections later in the article.

Because the Laowa 10mm auto focus lens has a five-blade aperture it produces a ten-point sunstar effect unlike any I have seen in other underwater ultra wide lens. This was particularly noticeable when I enlarged a photo where I had small micro bubbles all over my face mask and several of the small strobe lit bubbles had perfect ten point stars.



(Above) Because the Laowa 10mm auto focus lens has a five-blade aperture it produces a ten-point sunstar effect unlike any I have seen in other underwater ultra wide lens. This was particularly noticeable when I enlarged a photo where I had small micro bubbles all over my face mask and several of the small strobe lit bubbles had perfect ten point stars.

Nicole, Devil's Ear Spring Florida, Sony A7R V, Laowa 10mm F/2.8, Marelux housing, 230mm port with 20mm extension, two Marelux Apollo III strobes. ISO 640, F/13, 1/100th sec.

This is an effect I hope to be able to reproduce in other situations using ambient and strobe lighting.

Field Testing The Laowa 10mm

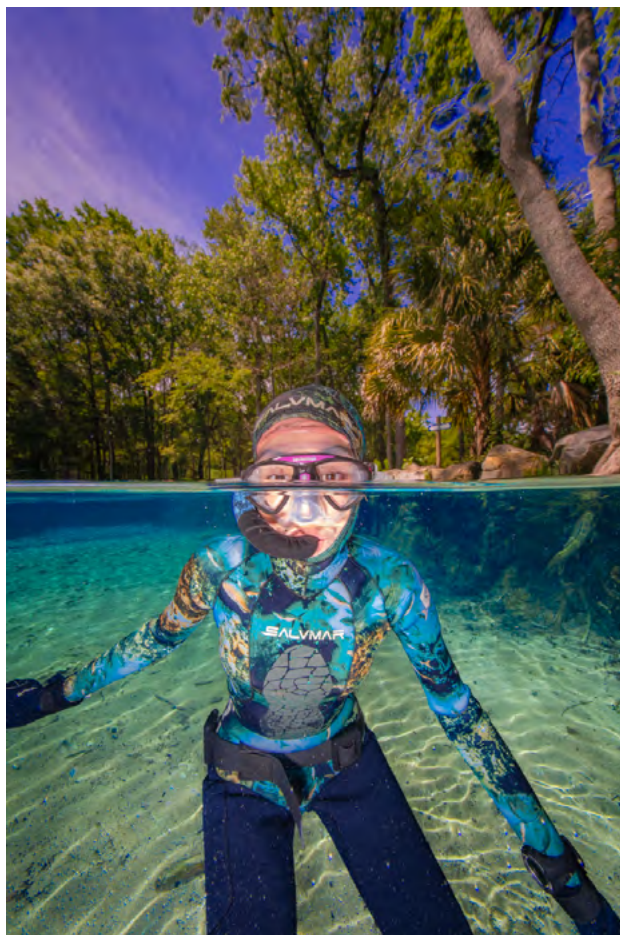
During my review I shot the lens with the Sony A7R V at up to six frames a second. While this is not high speed by today's camera standards it is about as fast as I want to shot for over 99% of my underwater work.

With the Sony A7R V camera the auto focus was very accurate. The AF performance with focus-tracking was seamless and extremely quick locking onto eyes and faces even at a distance. Laowa describes auto-focus as “nothing short of superb” in the venuslens.net lens description.

I shot the lens in low ambient light with moving subjects and I would agree that Auto focus is every bit as good as the top Sony FE GM lenses I own. Laowa describes the 10mm’s versatility as very well suited to architectural, astro, landscape and ultra-wide portrait photography. I would suggest that Laowa add underwater photography to the list because this lens is a blast to use for a verity of U/W imaging situations.

The look from this lens is unique in the sense that it adds a new perspective to ultra-wide imaging that had only been achieved with fisheye lenses in the past.

Every ultra-wide lens both fisheye and rectilinear allow you to create forced perspective views that manipulate human perceptions to make objects appear larger, smaller, farther away or closer than they



actually are.

With fisheye lenses of the same 130 degree AOV more barrel distortion occurs than with rectilinear lenses causing subjects in the center of the frame to bulge outward and straight lines to curve wildly. This is not necessarily a bad thing it is just what makes the two lenses differ when shooting the same subject from the same distance.

While field testing the Laowa



(Left) Caitlyn, Ginnie Springs Florida, Sony A7R V, Laowa 10mm F/2.8, Marelux housing, 230mm port with 20mm extension, two Marelux Apollo III strobes. ISO 100, F/22, 1/200th sec.

(Above) Caitlyn, Ginnie Springs Ballroom Florida, Sony A7R V, Laowa 10mm F/2.8, Marelux housing, 230mm port with 20mm extension, two Marelux Apollo III strobes. ISO 400, F/9, 1/250th sec.

10mm I exclusively used the Sony Alpha A7R V camera. This is a 60 mega-pixel camera that exposes flaws in many lenses with inferior image quality. I also used the Marelux MX-A7RV housing with a verity of Marelux ports and extensions. At this time I want to remind everyone that I am part of the Marelux management team and a Marelux Product Specialist. This review is about the quality of the Laowa lens being reviewed and not

the additional tools I used to test this lens.

I used three different ports for this review - a 140mm with the sunshade removed, 180mm with the sunshade removed and a 230mm all with a verity of extensions. With the 140mm dome I settled on 35mm’s of extension while the shade was removed. Without removing the shades on the 140 and 180mm domes vignetting occurs way before the port

is extended far enough to get any sharpness beyond the center of the frame.

My 140mm port has a bayonet sunshade while the 180mm requires you to remove way to many Allen screws to be practical. I also didn't see any difference between 140 and 180 in fact the 140 because it is a fisheye design worked better than the 180 which I soon eliminated from the testing.

With the 230mm port I was getting slight vignetting with 30mm's of extension so I ended up using a 20mm extension. I would have tested a 25mm extension but Marelux does not offer that size at this time. My other option would have been to remove the top and bottom blades that make up the 230 ports sunshade and use a longer extension. This is something I will try at some point in my swimming pool but unlike the 140mm dome the chance for damaging the 230 port would be much greater.

As I remarked above I found the auto focus using tracking to be spot on with excellent eye sharpness for both humans and animals. I used the tracking with the small focus spot for both AF-C and multi shots up to ten frames. In darker environments like the attached backlight diver descending into the cave system the AF didn't miss a shot. The fill flash was

with two Marelux Apollo III strobes where the modeling lights were not used for focus assist.

The prevailing wisdom when using rectilinear lenses in a dome ports for full frame is to shoot at a minimum of F/13 to around F/16 and at F/22 for splits. You will see that among the attached photos most are in the F/13 to F/8/9 range. If you have no tolerance for soft corners in your images this many not be the lens for you. It is hard to get sharp corners with lenses in the 16/17mm range although many work well in a 180mm dome if they have a minimum focus distance in the 19cm or less range. The truth be told I don't see huge differences in corner sharpness at like F/numbers between water contact lenses at 130 degrees, fisheye lenses and the Laowa all things being equal.

If you are photographing pool tiles and flat pool surfaces you may manage to find differences but in the real world the differences are limited by other factors in many cases. While shooting with the twin Apollo III strobes I used the same strobe placement I would with fisheye and WCL lenses keeping the strobes well behind the port to prevent any flare from the strobes into the port.

The Laowa lens has fairly bold white lettering on the face of the lens. With some wide lens systems I have used the white lettering reflects from



Jessie, Ginnie Springs Florida, Sony A7R V, Laowa 10mm F/2.8, Marelux housing, 230mm port with 20mm extension, two Marelux Apollo III strobes. ISO 400, F/10, 1/250th sec.

the port into the lens resulting in white letters and numbers across the image. I have found this to be most prevalent near or at the surface and when using acrylic ports. The dome glass coating for all three of the ports I used prevented this from being a problem.

I used two eight inch arms for each strobe and no arms for some of my pool tests with the 140mm dome port. Omitting arms is a technique I started using more than a decade ago shooting fisheye lenses with small

domes and small systems like the M43 cameras. It will work equally well with the Sony camera housings however for general use on larger subjects like people I like the versatile of arms. I am in the camp of U/W photographers that like to limit arm lengths as much as I can. Others will prefer much longer arms and both systems can be made to work well with this lens.

In post processing any 130 degree lens in combination with a 60MP camera can give great leeway for making crops to element soft corners.

Nicole, Devil's Ear Spring Florida, Sony A7R V, Laowa 10mm F/2.8, Marelux housing, 230mm port with 20mm extension, two Marelux Apollo III strobes. ISO 640, F/13, 1/100th sec.

My preferred LightRoom program does not include lens profiles for the Laowa 10mm at this time so some improvement to corners could come with a lens profile update.

This Laowa 10mm has not been added to any housing manufacturers port charts that I can find so as with many new lenses that I have tested the port sizes and extension sizes have been solely selected by me and may be subject to tweeking at some point.

I purchased my Laowa 10mm direct from venuslens.net and was not given any discount or test lens for review. I have in the past been loaned equipment for review but in this case I was quite eager to own the lens because I believed it would add a new perspective to my work.

I have not been at all disappointed with the lens so far. Checkout the venuslens.net website and if Venus/Laowa are reading this review we underwater photographers would love to see auto focus versions of your excellent Marco lenses and fisheye lenses.

Phil Rudin
Instagram



Don't settle for 2nd best



Film - No Filter;
No White Balance



Digital - No Filter;
Manual White Balance



Digital - 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.

Simple and inexpensive, yet so effective.

www.magic-filters.com