

Nikon Z7 Underwater Review

by the Backscatter Team

The Nikon Z7 is the first full-frame mirrorless camera from Nikon, and it's a high-resolution 46-megapixel beast that produces the best overall image quality seen yet from a mirrorless camera. Team Backscatter set the camera up in a housing and headed down to the Caribbean for a comprehensive underwater field test. Read on and watch the video below to learn what underwater shooters need to know about the Nikon Z7 and why we have affectionately dubbed it the 'Mini-D850'.

In the case of the Nikon Z7, we are comparing the image quality against the Nikon D850 - which is the Nikon Z7's closest relative - and our current pick for best still image quality produced from any camera tested underwater so far.

The Nikon Z7 packs the best imaging sensor found in any current mirrorless camera. Images that the Nikon Z7 captures are packed with sharp detail and vibrant colors and have become the new benchmark by which mirrorless image quality will be judged.

The Nikon Z7 is leading the current camera pack when it comes to

raw image quality, coming in second only to the Nikon D850. One would have to get down to some really tight pixel-peeping to pick out any significant differences.

The Nikon Z7 shares the Nikon D850's native ISO value of 64 for an additional two-thirds of a stop of dynamic range, giving us that phenomenal detail in the highlights and shadows. A good example of this is in wide scenes where the reef in the foreground is dark and the sunball-lit surface is clipping out to pure white.

One of the biggest things to consider when looking at mirrorless cameras is the Electronic Viewfinder (EVF). The lack of an optical prism and mirror within the camera body is the defining difference between Mirrorless and SLR cameras. Until now, the electronic viewfinder found on most mirrorless cameras has been

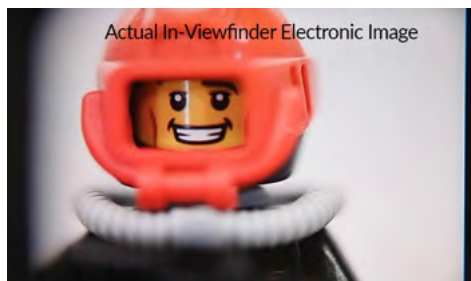
This school of grunts provides an accurate look at the beautiful color reproduction and sharp image detail that the Nikon Z7 produces straight-out-of-camera.

Nikon Z7 | Nikon 8-15mm @ 15mm | 1/125sec | f10 | ISO 100



See our comprehensive video
Topic Time Codes
00:28 - Image Quality
02:25 - Electronic Viewfinder
05:07 - Autofocus
07:23 - Camera Body & Controls
09:35 - How We Shot It
11:21 - Video
13:26 - Conclusions





Actual shot of the in-viewfinder electronic image, which has a sharp resolution and good dynamic range.

our biggest turnoff. The problem is that most of them just don't come close to the dynamic range that an optical viewfinder can display. This leaves underwater photographers to struggle when composing shots because you just can't see what's going on in the often underexposed foreground and overexposed background.

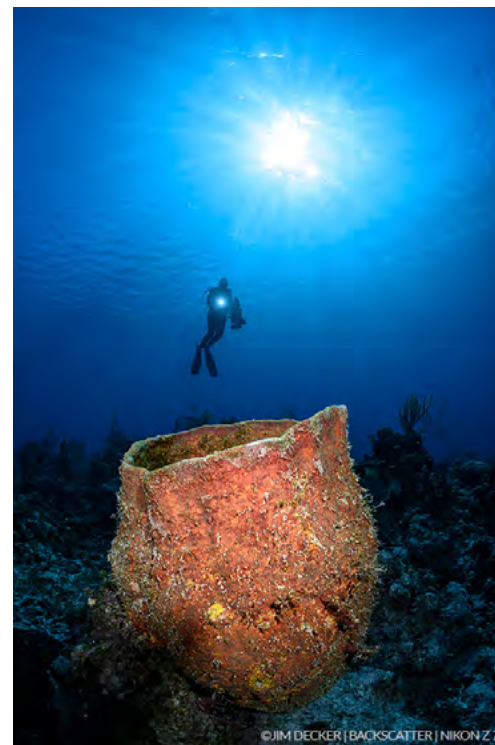
As soon as the Nikon Z7 was in a housing and under the surface, the new and improved electronic quality was immediately apparent. This is absolutely the best electronic viewfinder that we have put our eyes and mask up to yet. It's so good that you'll almost think that you're looking through an optical viewfinder.

While it is possible to shoot only from the LCD screen and not use the electronic viewfinder at all, it is actually advantageous to use the electronic viewfinder in order to shoot as close as possible to traditional SLR style.



This shot was executed with the housing tucked into the sand and the lens aimed slightly upwards, creating an awkward shooting angle if composing from the LCD screen. Thanks to our expanded 45-degree viewfinder and exceptional electronic image quality, the viewfinder could be easily effectively for composition.
Nikon Z7 | Nikon 8-15mm @ 15mm | 1/200sec | f8 | ISO 64

This can bring a number of benefits, but where it has the most impact is when shooting macro and using an expanded 45-degree viewfinder on the housing. By keeping an eye on the viewfinder, the camera



The dynamic range that the Nikon Z7 is capable of, thanks to a native ISO value of 64, allows for super-rich details in both the darkest shadows and brightest highlights, both of which are on full display here in the shadowed reef and bright surface.
Nikon Z7 | Nikon 8-15mm @ 15mm | 1/200sec | f9 | ISO 64

and housing can be placed nice and low in the sand, and you will not have to contort your head and face into an awkward angle or get yourself buried in the sand just to see what you're shooting.



This shot was easily composed thanks to the improved electronic viewfinder image quality. The edges of the shadowed reef could be lined up and framed properly just as if shooting with an optical viewfinder thanks to the impressive dynamic range and detail of the electronic viewfinder.
Nikon Z7 | Nikon 8-15mm @ 15mm | 1/125sec | f10 | ISO 100

Another benefit of the electronic viewfinder is the ability to see your image playback for review purposes directly in the viewfinder, meaning you never have to take your eye away to review your shot



©JIM DECKER | BACKSCATTER | NIKON Z7

For this shot, the autofocus point selector was moved directly over the blenny and the autofocus button was held down for continuous tracking as the blenny moved in and out of his hole, resulting in a sharp finished product with the proper focus achieved. Nikon Z7 | Nikon 105mm VR | 1/250sec | f36 | ISO 100

and make adjustments. This is incredibly helpful when shooting super macro, because any camera movement, even just a few millimeters, can totally lose your subject. Having to pull your head away from an optical viewfinder to see your image on the LCD screen can sometimes mean just enough system movement to have to hunt for your subject again or entirely re-compose the shot.

Between electronic image quality and in-viewfinder image review, we feel that the EVF on the Nikon Z7 has raised the bar for what we expect from a mirrorless camera electronic viewfinder.

Autofocus

Overall the Nikon Z7 performed fairly well in the autofocus department, with good speed and accuracy. It wasn't quite as fast as a Nikon SLR but



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Autofocus was able to pick up on the eye of the blenny as long as it was fairly stationary and was not too far out of focus in the frame, to begin with, ultimately resulting in a crisp photo with the critical focus point right where we want it.

Nikon Z7 | Nikon 105mm | 1/250sec | f22 | ISO 100

it still felt snappy and responsive. The biggest thing to note about autofocus is that the Nikon Z7 uses an entirely new system for autofocus, both inside the camera and in terms of user control, so those migrating from a Nikon SLR may find it to be a little unfamiliar at first, but ultimately easy to adjust to and use.

The Nikon Z7 has both single and continuous autofocus modes, with controls and focus points being easily accessible through the 'i' menu, as there is no dedicated AF button such as on an SLR body.

There is a 493-Point Phase Detect Autofocus subject tracking mode, but it's not the same as the 3D AF Tracking Mode that we have in the Nikon D850 and Nikon D500. While this feature does a decent job on the Nikon Z7, the accuracy, intelligence, and speed of the 3D tracking on Nikon



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We could have nailed more in-focus shots of this moving subject with a higher-performance continuous autofocus system. Ultimately we achieved a good result with the 493-Point Phase Detect Autofocus, but we would have had more frames to choose from and fewer elements to manage in real-time if 3D AF Tracking were available.

Nikon Z7 | Nikon 8-15mm @ 15mm | 1/125sec | f14 | ISO 800

D850 is a high bar to meet. There is definitely a noticeable difference between the two when compared side by side, with the Nikon D850 taking the top spot.

Super macro was shot with a Nikon 105mm VR lens and diopter. Shooting like this provides a 1:1 and higher reproduction ratio, which is a true stress test for any autofocus system. For most shots, if the focus was 'roughed in' then the autofocus could do the rest of the work and snap to the subject consistently. If the shot was so out of focus as to be nothing but bokeh blobs through the viewfinder, then the camera wanted to hunt a lot more and had a harder time snapping to focus. In other challenging autofocus scenarios, such as close focus wide angle,



3rd party lenses and older Nikon lenses wouldn't autofocus with the Nikon FTZ Adapter, so for now, it's best to use current generation Nikon lenses such as the Nikon 8-15mm and Nikon 105mm VR.

the camera experienced some focus hunting as well.

It seemed that the Nikon Z7 liked surfaces with a lot of texture and contrast for the best autofocus results. If looking for the ultimate high-performance autofocus, the Nikon Z7 just isn't going to match what the Nikon D850 can do. Overall the autofocus is pretty good and is ranked about in the middle of the pack compared to other current full frame mirrorless cameras.

All New Z Lens Mount & Mirrorless Body

The most unique aspect of the camera body itself is the debut of the new Z Mount for Z Mount lenses. Nikon plans to accommodate some very wide open aperture lenses, which need a wide opening to the sensor, so the Z Mount was developed to achieve this.

At the time of this review, there aren't any Z Mount lenses that we're excited about shooting underwater. Most optics recommended for underwater are either extreme wide angle or very tight macro, and the

current Z Mount lenses on offer are limited to mid-range zoom lenses.

Fortunately, Nikon also released the Nikon FTZ Adapter, so your F Mount lenses will work just fine. The Nikon FTZ Adapter supports full autofocus, aperture, and metering just as if using the F Mount lenses on a native body.

The camera body itself is smaller than a Nikon D850 or Nikon D500 and it really doesn't sacrifice anything significant when it comes to primary controls and operation. One of the most useful features is the 'i' menu for quick menu access to essential controls.

There's a photo/video mode switch, and the camera remembers the independent settings for each, so no time is wasted adjusting shutter speed and white balance when changing modes on-the-fly.

There are front and rear dials for aperture and shutter speed, and a dedicated ISO button. There is also a single XQD card slot.

While this body is smaller than it's SLR counterparts, for underwater



For action shots one must actually be able to see the subject the entire time, and not be hindered by an image popping up in the viewfinder after every activation of the shutter. By disabling the automatic image review we are able to keep shooting single frames as fast as our strobes will recycle with an uninterrupted view, maintaining our composition and focus on the subject to ensure the precise moment is captured.

Nikon Z7 | Nikon 8-15mm @ 15mm | 1/200sec | f11 | ISO 100

purposes, by the time the camera is in a housing with a port to support a full frame lens, not to mention arms and lights, you really aren't left with any huge size savings or reduction of in-water profile. For travel and diving purposes, this system is basically the same as an SLR.

Best Underwater Settings

Straight out of the box, most mirrorless cameras, the Nikon Z7 included, are configured by default to be shot like a compact camera - that is they expect to be shot primarily from the LCD screen. We want to set up the Nikon Z7 to shoot as close as possible to an SLR to make effective use of the electronic viewfinder.

A key setting on the Nikon Z7 is

The Nikon Z7 produces rich images on par quality-wise with it's bigger brother, the Nikon D850, resulting in shots that are packed with sharp detail and vibrant colors.
Nikon Z7 | Nikon 8-15mm @ 15mm | 1/125sec | f11 | ISO 800

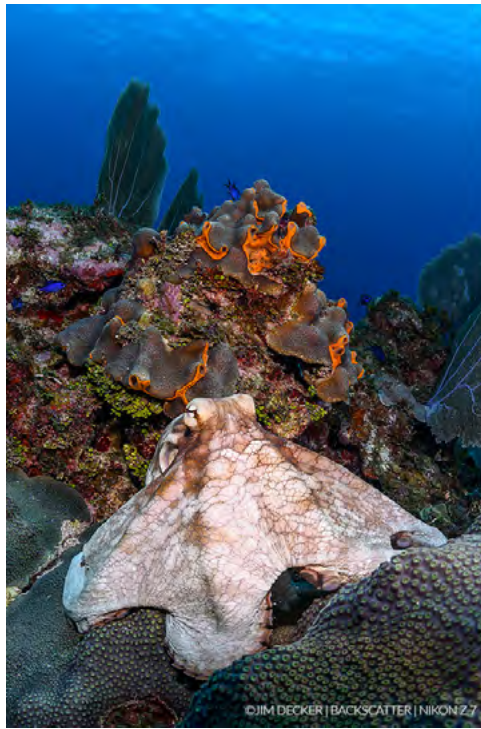
to disable the automatic image playback in the electronic viewfinder. This allows for an uninterrupted live view through the EVF, so you can shoot away without any blackout or pop-ups. This nets a faster overall shooting speed, where the only speed limitation is that of the recycle rate of our strobes.

When you need to check the shot, just hit the playback button and the image pops up right there in the EVF giving you instant feedback and allowing you to keep your position. This also frees up the LCD screen to display your 'i' menu and key settings.

Another helpful setting to change is the press-and-hold requirement for buttons like ISO. These are changed to 'toggle' so that it is not necessary to perform an awkward control-hold and dial activation simultaneously.

Full Frame 4K Video Capture

The Nikon Z7 captures full frame 4K 30p video at 144 megabits per second in H264, essentially



sharing the same video specs as the Nikon D850. It uses the full width of the sensor when recording in 4K, so there is no crop factor to contend with when rolling video. This is excellent because it allows for super-wide fisheye shots. Additionally, it is possible to enable the crop-sensor DX mode to tighten up the shot by 1.5x without sacrificing depth of field, especially helpful for getting in tighter when shooting super macro and dealing with paper-thin depth of field.

For underwater shooters, the true test of any camera's video capabilities comes down to ambient light custom white balance color. Just like the Nikon D850 before it, the Nikon Z7 produces some truly great looking ambient light underwater color.

The white balance results look good down to about the 45-foot to 50-foot range in tropical, clear,



See our underwater video ambient light custom white balance test results.

The color results looked very similar to those from the Nikon D850, which was a monumental leap forward for Nikon. Consider that the Nikon D500 was basically unusable for video and that camera is still current. The Nikon Z7 is producing a massive amount of underwater color improvement over previous Nikon cameras.

blue water testing conditions. Between 50-feet to 55-feet is where the color began to fall apart a bit, with the water color starting to shift away from blue and more towards magenta. This is about the normal expected depth limit for most ambient light custom white balance captures, with Canon being the notable exception by capturing accurate color down to the 70 foot depth range.

See our underwater video ambient light custom white balance test results.

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There isn't a dedicated white balance button on the camera, but the function is easily accessed through the 'i' menu and a new white balance can be executed super easily. This is one of the fastest and easiest to execute custom white balances out there right now. You also get 6 separate banks for storing white balances, which is awesome because we have to capture a new one every for every 10-feet of depth that we change.

Conclusion - The Mini-D850

The Nikon Z7 is our new favorite full frame mirrorless camera and we've taken to referring to it as the

"Mini-D850". It packs an awesome image quality on par with the Nikon D850 thanks to the insanely sharp 46-megapixel resolution and a native ISO value of 64 for outstanding dynamic range. It has the best electronic viewfinder that we've seen yet, and it displays an electronic image that is sharply defined with plenty of dynamic range detail. The autofocus was fast and accurate overall, though we do wish the Nikon Z7 had the same autofocus system and operation as the Nikon D850. While the body itself is smaller and lighter than an SLR, the overall underwater system size is about the same.

Who Is This Camera For?

The Nikon Z7 is a great choice for primarily still-image shooters that want a smaller-than-an SLR camera body without sacrificing image quality or camera controls, the best electronic viewfinder currently available, and video capabilities to rival that of the Nikon D850.

If your primary interest is shooting video, then it's worth looking at Canon over Nikon for the best in-camera ambient light color, but for those who want to primarily shoot stills and also be able to roll some video that looks great down to 45-feet then the Nikon Z7 is a solid choice.

The end video product was basically equivalent to that produced by the Nikon D850.

If camera body size is of no concern, then go for the Nikon D850 specifically to gain the 3D AF Tracking Mode, which is the most notable practical shooting advantage that the Nikon Z7 just cannot compete with.

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