

Best Buoyancy

by the Backscatter Team

We consider buoyancy the number one reason divers struggle with underwater photography. A camera system with comfortable buoyancy is much easier to use, will result in better photos, make your dive more enjoyable, and protect the reef.

There is no one-size-fits-all formula for buoyancy, but there are some ground rules. First, make sure you understand the smaller your housing is, the more likely you'll need to add floats. Second, you'll want to determine if you're more comfortable with positive, negative, or neutral buoyancy and select the best buoyancy accessories to meet your needs. We'll walk you through the details below.

Buoyancy Vs Trim

First, we need to define two key terms in underwater photography housing use. "Buoyancy" is how heavy or light your camera feels in your hands. "Trim" is how much your housing twists forward or back in your hand.

A perfect camera would feel weightless underwater (perfect buoyancy) and not further tire your wrists with it twisting up or down

(perfect trim). If you've experienced these issues, this is the article for you.

Small cameras can be bricks underwater

Customers visit Backscatter to put their hands on housings and are always attracted to the most compact option. We always warn that "While it looks travel friendly, you'll need to add floats so that it's not as heavy as a brick underwater." Experienced underwater photographers quickly learn that smaller camera systems need a significant bulk of arm floats to make them enjoyable to use underwater. While compact housings may be small in travel size, they lack air space in the housing to make them easy to handle underwater. Adding additional lenses, focus lights, and hardware can increase this underwater weight. Buoyancy on the arms is a must and you'll definitely want additional buoyancy options if adding wet lenses.

Cinema housings are the largest for travel but are surprisingly fun to swim. Most cinema housings come with trim weights that can be positioned front or back to dial in perfect trim.



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Diving with a perfectly neutral rig will make underwater photography more enjoyable and you more productive. Make the time to get your rig dialed in.



Positive Buoyancy Pros And Cons

If you're scuba diving, you typically don't want your system to be positively buoyant. When you pull down a positive camera, you'll go up and get annoyed. This can also result in potentially dangerous scenarios like having to chase your camera to the surface. It's also difficult to manage a system that wants to keep floating away from you. It takes additional energy and will result in more air consumption. If you're snorkeling or free diving, a slight positively buoyant system might be preferred as you could drop the camera in an emergency and retrieve it at the surface.

Negative Buoyancy Pros And Cons

A camera system that is too heavy will become fatiguing and increase your air consumption on Scuba. A heavy camera will affect your trim and balance in the water. As you push a heavy camera forward, you'll find that your head drops down and your feet go up. Fighting this constant change in body position will tire you out and increase your air consumption. Heavier systems can also lead to dangerous scenarios if you're compensating with excess

air in your BC. If you need to drop the camera in an emergency, you'll quickly find yourself floating to the surface. However, some advanced freedivers prefer a slightly heavy camera to aid in their head first descent. These advanced freedivers prefer to "follow their camera down" but they are also willing to lose their camera if dropped in an emergency.

Perfectly neutral systems are easy to push through the water and offer less fatigue for day after day of use. Most importantly, for video shooters, dialing the buoyancy to neutral can result in very smooth camera movements. A perfectly neutral camera rig can actually be fun to use underwater as your camera can float next to you hands free. Just push your camera above you and it will just float there. You can let your hands go while you adjust your weight belt or fiddle with something else.

Different divers will prefer different weights to their systems. Most of the Backscatter staff set our camera systems between 0.5-pounds and 1.5-pounds (225 to 680 grams) negative. We find a slight bit of negative buoyancy allows us to maintain smooth camera moves but also allows us to set the camera on the bottom without it drifting away when we need to use our hands to assist another diver or deal with a situation. More than 1.5 pounds (680 grams)



WEIGHTS ON A DOME



**WEIGHTS ON AN
EXTENSION RING**

will start to strain arms and wrists.

Our professional clients prefer to first dial in their housing at neutral buoyancy by adding a float belt or float bar to just their housing. Then they add floats to their arm system to counteract the weight of their lights. This allows them to add or remove lighting systems without the fuss of reconfiguring arm floatation when they switch from with and without lights. While it's possible to get your housing and lights dialed on buoyancy, you'll need a second float configuration when switching from wide to macro.

Dome ports

A persistent problem with large domes is that the big air pocket wants

to float to the surface and cause trim problems. This imbalance often strains the wrists of shooters and takes more energy to manage your camera. Acrylic dome ports are most prone to this problem. Large glass domes perform better as the extra weight of the glass help to counteract the nose up trim.

To combat the positive buoyancy of large domes, you can add 0.5-1 pounds (225-450 grams) of weight to the extension ring or the back of the dome. We offer stick-on lead weights and some divers even resort to neoprene ankle weights to help dial in trim. For Ikelite housings, a ballast system is available to hold a lead dive weight under the dome.

A note of caution: Most of the Backscatter staff just deal with the

twist, however some of our clients with wrist issues like trim weights. Add as little weight as possible and only if you really need it. Keep your weighting such that the dome still wants to trim up. This way if you drop your camera or need to set it down, the dome will trim up and will less likely incur costly scratches on the bottom.

Ikelite offers the Ikelite Trim Weight System to add weight and trim the dome port.

Wet Wide Lenses



Keep in mind, wet wide angle lenses don't have the same large air pocket that domes have. Most wet wide angle lenses will require a buoyancy collar. Collars specific to the Nauticam WWL-1 and the AOI UWL-09 PRO are available. The Nauticam WACP Wide Angle Conversion Port and the Nauticam WWL-C have built-in buoyancy to offset the underwater weight of the lenses.

Macro ports



With less air space, macro ports cause the opposite issue as dome ports. Macro ports want to sink, especially with flip holders and diopters attached. Camera systems with macro setups need more buoyancy. If good balance and sufficient buoyancy can't be achieved on your light arms, we recommend adding a buoyancy collar. Stix makes adjustable 10-float and 12-float collars that will bring your macro port closer to neutral and trim.

Tube Arms Vs. Foam Floats

The most common buoyancy solution is to add buoyancy to strobe or light arms. This can be done using high-density foam floats from Stix or static air-filled tube arms. Backscatter carries tube float arms from Ultralight, Nauticam, Isotta, and Aquatica in a wide variety of lengths and diameters. Each size will add a different amount

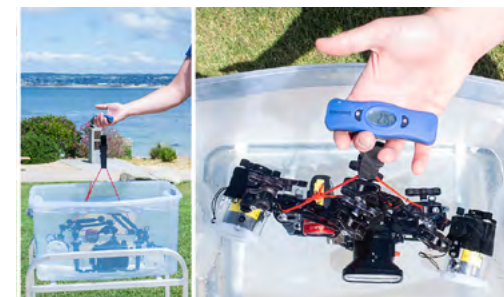


of positive buoyancy to a camera system. Tube float arms are an easy way to add buoyancy to a heavy camera system. But this method has its drawbacks. Tube arms can't be adjusted. If you have a set of tube arms that work with one port, it may be too positive or too negative for use with another port. Backscatter staff prefers using Stix adjustable floats added to normal strobe arms. These floats allow you to add or remove floats to adjust between a heavy macro set-up or a more positive wide angle set-up.

Both tube and float arms come in a variety of sizes and lengths. See the product grid at the bottom of this article for a full list of sizes and buoyancy. Keep in mind that larger diameter tube arms require use of longer clamps such as the Ultralight Large Clamp and the Nauticam Long Clamp.

A Nauticam 70x200mm Carbon Fiber Float Arm provides 13oz / 370g of positive lift. An Ultralight 8-inch Arm with (2) Stix FUL-3 Jumbo Floats provides 12oz / 340g of positive lift, but a third Stix FUL-3 Jumbo Float can be installed for a total of 13oz / 370g of lift.

Dial in your system



There are two ways to get your rig dialed in perfect. The easy option is to use our default arm and float combination and make sure you have extra floats on site. The other option is to go full nerd and actually measure how much floatation you need in your bathtub or trash can full of water.

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