

What makes an Aquatica an Aquatica!

Berkley White, known worldwide for his evocative work and famous for his workshops around the globe has this to say about his Aquatica housing:

My Aquatica 5D Mark II housing has not only shot my favorite video, it has more dives than most divers. It's travelled the world with me, has been passed to others as a demo unit, strapped onto underwater scooters, and has even survived rental abuse at Backscatter. It still looks and functions so well, we use it as a display model at trade shows. Its construction and black crinkle paint seem impervious to the bumps, scrapes, and corrosive abuse of daily use.

Berkley White



Above is a picture of Berkley's Aquatica housing which has over 1,500 dives on it, not only is the salt water environment known to be ruthless for the equipment, but the constant vibration and impact resulting from his intense travelling is brutal on the gears itself. Yet, a close look at the housing will not give away any signs of weariness, its protective finish and the smoothness of its controls as good as the day it came out of the box.

So, exactly what does it take to be an Aquatica? Well for starters, over a quarter of century of experience in this field has taught from the very beginning that everything in our housing is essential and should be treated as such. While we value aesthetic beauty as much as anyone, it will and should never eclipse the essential needs for surviving the rigors of underwater photography. In this game, poor choice of materials or slack quality control will quickly lead to disaster.

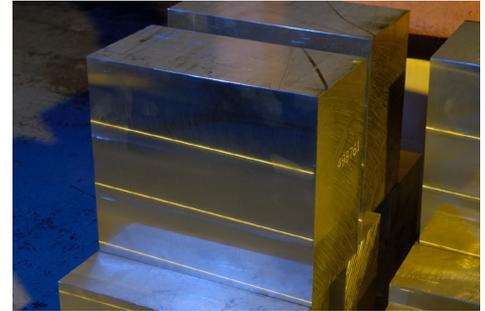
An Aquatica housing journey begins with a block of aluminum alloy, to be specific a block of **6061 T6** alloy used typically in the marine and aerospace industry, **6061 T6** is a type of precipitation hardened aluminum alloy. Magnesium and silicon are the major other elements of this aluminum alloy, the T6 temper classification typically has a tensile strength of at least 45,000 psi (310 MPa) and a maximum yield strength of at least 40,000 psi (275 MPa), we wanted a building block that went way beyond the required parameters needed for making an underwater housing.

Using such pressure resistant material and machining it on sophisticated machines such as the newer 5 axis Computer Numerically Controlled ones, allows Aquatica to precisely reduce weight by calculating the thickness of its material over the entire housing surface. This strategy allows an Aquatica housing

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to resist the pressure from crushing depth of 500ft /150m and beyond, way past its closest competitors. Aside from being the material of choice used for our housing, the property of the **6061** aluminum to resist tremendous amount of pressure make it a natural choice in the airplane industry and for aluminum scuba tanks.



Aluminum by itself, no matter how good and tempered it is, will only resist from the constant attacks of the marine environment for so long if left exposed.

Further steps will taken for added protection. Because the 6061 T6 aluminum it is so widely used by the military, a specific Anodic coating was developed for it, commonly known as a **MIL-A-8625 type 2** certification (and in our case a Class 2 which refer to it as being dyed), this process is a sulfuric acid anodizing.

Products that abide to the stringent **MIL-A-8625** specification are approved for use by all Departments and Agencies of the Department of Defense. Military specification does not get approval lightly, in order to meet the requirements, the anodized coating will have to resist a battery of torture, including a minimum of 336 hours being sprayed with a salt water solution, in the end, it will only get the stamp of approval if the anodizing coating show absolutely no signs of wear.



MIL-A-8625 type 3, Class 2 certification is a Iso used by Aquatica for protecting the strobe arms of its Technical Lighting Control division (aka TLC), this anodizing is refer to as hard anodizing in the industry, Type 3 is a coating that is particularly resistant to wear and is perfect for treating the arms surface as they will -have to feel the constant tightening pressure of a clamp at their end, what make the Technical Lighting Control so special is the additional Teflon® added to the hard anodizing process, this Teflon® act as an integrated lubricant which allows the TLC arms to be smoothly repositioned without having to loosen the clamps as is usually the case in other strobe arm found on the market.

The end result is strobe arm that need not rely on easily ripped O-rings or limiting locating pins to keep it in position. A twist of a TLC knob will secure the clamp to the arm and relocating it will not damage or scour the surface of the ball as an inferior product would.

Even so, the best anodizing process in the world is not impervious to the elements, if the anodizing coating is left unprotected, then fading and discoloring are likely to happen over time, if immersed in water with high sulfuric content, such as found frequently in Cenotes and underwater caves, this discoloring and fading is likely to appears in a matters of a few hours.

Aquatica has committed itself to further protect its housings as insurance that they would reliably operate in all possible diving environments and conditions.



This extra layer of protection comes in the form of a Polyester powder coating that is sprayed on the housing shells with an electrostatic process, this robust coating, once cured for 15 minutes at 350F/177C, will resist a direct impact of up to 160 in-lb (as per specification ASTM D2794), it is certified to resist yet another straight 1,500 hours of being sprayed with salt water and to meets or exceed the for environmental resistance to the elements.

The other metal you will find on our housings is stainless steel, type 304 is the variant we use for ours controls shafts and push buttons, lower grades such as the 316 series and other less stringent grades of steel often found in the industry are not only lest resistant to wear and structurally weaker, but often contaminated with iron particles. This would make them likely to rust and pit, and needless to say, lead to disastrous results in the end.



The Austenitic, 304 series of stainless steel alloy used by us, contain a maximum of 0.08% carbon, a minimum of 20% chromium and sufficient nickel and/or manganese to retain its austenitic structure at all temperatures from the cryogenic region to the melting point of the alloy. Every shaft is polished to a mirror finish, calibrated and its operation validated by the quality

control department. The selection of this material was carefully made to give the longest life expectancy to your Aquatica housing.



In keeping with the safety level accorded to your photographic equipments so far, all O-rings used on the Aquatica housings are of the Neoprene type, these O-rings are capable of working from 225F to -40F and are even highly resistant to such harsh solvents

as fuel and chemicals. These O-rings are doubled on controls shaft and push buttons benefits from a Quad-ring type of O-ring seal, this later being of the same neoprene material.

To cap of the safety theme, galvanic anodes are supplied on the housings for cathodic protection, these are made of zinc. The way cathodic protection works is by introducing a different metal, the galvanic anode, with a more anodic surface, this way all the current introduced by the introduced anode will flow to it and the metal needing protection becomes cathodic in comparison to the introduced anode. This transfer the oxidization reactions to the easily replaceable galvanic anodes which will sacrificed in favor of the housing strategically important aluminum shell.



Jean Bruneau, Aquatica Technical Adviser

