

# WATERSHOT, INC.

*DIVING INTO NEW UNDERWATER ENCLOSURE MARKETS WITH SOLIDWORKS SOLUTIONS*



Watershot relies on SOLIDWORKS design and simulation tools to create innovative, watertight enclosures, such as the company's line of smartphone products.

### Challenge:

Grow and advance the development of underwater camera housings used by professional photographers and cinematographers to take advantage of emerging consumer markets.

### Solution:

Leverage SOLIDWORKS Premium design and SOLIDWORKS Simulation analysis software to quickly and cost-effectively capitalize on new product opportunities.

### Results:

- Expanded into smartphone underwater enclosures and other markets
- Cut design cycles in half
- Designed first dedicated enclosures for professional digital movie cameras
- Minimized errors and physical prototyping

Since 1995, professional underwater photographers and cinematographers have more than likely used waterproof camera enclosures developed by Watershot, Inc. Today, scuba, snorkel, and free-dive enthusiasts can use their smartphones—protected by a Watershot enclosure—to do the same thing.

Leveraging the expertise gained working with famed underwater cinematographer Pete Zuccarini, who shot the underwater sequences for the *Pirates of the Caribbean* movies and the Oscar-winning film *Life of Pi*, the San Diego-based company has grown from working primarily on special projects—where it still shines—to become a leading manufacturer of all types of waterproof enclosures. Founder Steve Ogles credits Watershot's success to the talent, longevity, and loyalty of his engineering staff, and the decision to adopt the SOLIDWORKS® development platform.

"Initially, we were more of a job shop—designing, machining, and assembling waterproof enclosures for professional underwater photographers and filmmakers," Ogles explains. "We still do special projects and have developed many of the innovations in the underwater film industry. However, with the help of SOLIDWORKS tools and the abilities of our talented people, we have grown by developing our own products."

Watershot relies on SOLIDWORKS Premium design and SOLIDWORKS Simulation analysis software to develop watertight enclosures that withstand the pressures and forces associated with various depths underwater. The SOLIDWORKS implementation immediately cut design cycles in half and eliminated errors. Since then, the company's engineers have come to value the software's intuitive integration of CAD and finite element analysis (FEA) tools, combination of visualization and surfacing solutions, and compatibility with tooling and manufacturing partners.

"We've periodically looked at other development solutions, but SOLIDWORKS has always come out on top," stresses Project Engineer Stephanie Griffin Peña. "The software provides everything we need, and the way that Simulation works with the CAD package really streamlines the process."



**"We are a small, growing company with limited resources. SOLIDWORKS**

**Simulation allows us to understand the influence of underwater pressure and forces during design, which saves time and money."**

– Stephanie Griffin Peña, Project Engineer

## FROM UNDERWATER SMARTPHONES TO RESCUE VESTS

Using SOLIDWORKS solutions, Watershot has developed a range of new products, including enclosures for smartphones, consumer cameras, LED-based underwater lighting systems, and sophisticated deep-sea drilling heads. The company's smartphone line—with an enclosure for the iPhone® 4 on the market, and enclosures for the iPhone 5 and Samsung™ Galaxy in development—enables users to shoot underwater photos and videos with their phones. One model is rated for depths up to 40 meters, the other, up to 60 meters.

Watershot has also collaborated with renowned free diver Terry Maas to develop an emergency rescue vest to save free divers from drowning due to an oxygen-deprivation condition known as shallow-water blackout. The U.S. military has embraced the lightweight, unencumbering rescue vest, which brings the wearer to the surface via CO<sub>2</sub> cartridges.

"Developing our own products was a true test of strength," Ogles recalls. "We succeeded because our operation is very lean, in large part because we use SOLIDWORKS. The integration of design and analysis in SOLIDWORKS is wonderful, and our staff is especially skilled at using SOLIDWORKS to quickly and cost-effectively develop innovative products."

## SIMULATION DRIVES DEVELOPMENT SPEED AND PRODUCT PERFORMANCE

With SOLIDWORKS integrated design analysis tools, Watershot can rapidly create design concepts and simulate their performance at various depths underwater. Because Watershot engineers can accurately simulate product behavior, they can refine designs while avoiding costly prototypes.

During development of the iPhone 4 enclosure, tooling samples revealed that the enclosure pressed against the smartphone's touch screen at a certain depth, preventing the phone from functioning. SOLIDWORKS Simulation software enabled Watershot to solve this classic deflection problem and optimize the design without making substantial tooling changes.

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Using SOLIDWORKS design and simulation solutions, Watershot has expanded its product line from its initial professional underwater camera enclosures to a range of new products, including enclosures for smartphones, consumer cameras, LED-based underwater lighting systems, and sophisticated deep-sea drilling heads.

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## DESIGNING THE FIRST UNDERWATER DIGITAL CAMERA HOUSINGS

One of Watershot's series of underwater cinematography innovations was the development of the first dedicated underwater enclosures for the ALEXA line of digital movie cameras for Zuccarini Watershot LLC. These enclosures were used to shoot underwater scenes in *All Is Lost*, starring Robert Redford. Produced by German filmmaking equipment manufacturer ARRI, ALEXA cameras were among the first digital cameras to be used to shoot studio features in a digital format instead of film.

"The ALEXA fleet of underwater camera housings makes great use of carbon fiber materials and represents an important transition for us in creating waterproof enclosures for digital-based equipment, which presents additional challenges," Ogles explains. "Here again, SOLIDWORKS proved its value in enabling our team to innovate a whole new type of enclosure. I'm convinced that we made the right choice with SOLIDWORKS."

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