Globe Composite Solutions, LLC

Transforming Complex Problems into Extraordinary Solutions

Sub Sea Systems Sea Trek Dive Helmet®

Situation

Globe's customer, Sub Sea Systems®, provides recreational diving systems to resorts and aquariums worldwide for Sub Sea's Sea Trek® tours. A demanding application, since the helmet needs to function under submersible pressures, sustain the wear-and-tear of everyday use, withstand chlorinated/salt water and the intense UV rays of the sun.

Since Sub Sea Systems® and their Sea Trek® tours are growing rapidly, the company was having difficulty keeping up with demand as each helmet was handmade using lay-up fiberglass requiring 40 man-hours of work. Over 50 lbs. of ballast weight was integrated into the helmet itself, making it costly to ship to worldwide. Additionally, the fiberglass helmet would often chip, peel or crack, requiring expensive and time consuming repairs.

Globe's Solution

Globe developed a tough, UV-resistant, liquid-castable material -- Brandonite® 1100-80D -- for Sea Trek®'s helmet's shell that can be poured into a mold producing the finished shell with minimal secondary, finishing work. The scratch-resistant helmet's shell is durable with the color embedded into the material -- thus, improving physical appearance of the overall helmet, reducing damage, and the need for constant repairs. The liquid castable material allows for greater design flexibility, letting Globe create a modular ballast system for the helmet's shell, which can be shipped separately, saving Sub Sea Systems® shipping and handling expense.

Benefits & Results

The end result is a more cost-effective, more durable, and rapidly produced part with a better finished quality that meets our customer demands. Shipping, maintenance, and repair costs are reduced significantly. Globe estimates that it will save the Sub Sea Systems® approximately $1.5 million over the next 3 years by using Globe's all-composite shell for their helmet.

Benefits

- Cost-Effectively Replaces Fiberglass
- Outstanding UV & Hydrolytic Stability
- Greater Design Flexibility
- Ideal for Marine, Medical & Defense
- Available in Many Colors and Finishes

Material

Brandonite®1100-80D. This liquid-cast high-performance polyurethane combines outstanding rigidity with an excellent balance of physical properties such as wear resistance, hydrolytic degradation, and UV-stability.

Development Time

Total development time for this product was 11 months. Five months were spent on formulating and testing the material's durability for UV-resistance and other wear and tear. The material had to be tough enough for the application, yet still provide an aesthetically pleasing finished product.

Potential Applications

Brandonite® 1100-80D is ideal for replacing components traditionally made with fiberglass. Target volumes are typically less than 5,000 parts per year and can be of any size. The liquid casting approach allows for complex geometries to be formed using low-cost tooling while eliminating or reducing traditional post-machining or finishing operations associated with hand lay-up fiberglass and a gel-coat. Possible applications include:

- Military - Sonar, acoustic or radar Covers
- Marine - Housings, covers, and accessories
- Medical - Covers, bezels and structural uses
- Recreational & Household uses
- Industrial – Covers and structural uses