



A Quest remotely operated vehicle (ROV) is recovered after a successful dive.



The innovative Quest thruster assembly. The Quest's electric thruster is much more efficient than the hydraulic thrusters used by all other ROVs in the Quest's performance class.

Unique Co-Molded Urethane Casting Cuts Weight and Cost of Undersea Robot

A unique urethane casting, believed to be the first ever to be co-molded with stainless steel, helps reduce the weight and cost and increase the life of an undersea robot.

The Quest remotely operated vehicle (ROV) from Alstom Schilling Robotics, Davis, California, was originally designed to perform deepwater construction, inspection and maintenance tasks on offshore oil production rigs. At the heart of the Quest's propulsion system is an innovative 7.5 kW electric ring thruster, which replaces the hydraulically powered thrusters typically used on ROVs. Schilling engineers originally ordered cast urethane blades as prototypes, planning to switch to aluminum or injection molded plastic.

"When we received the prototypes we discovered that they came very close to meeting our specifications for the actual parts," said Willi Klasen, Chief Technology Officer for Alstom Schilling Robotics. "Working with the company that built the prototypes, Solid Concepts, we discovered that they could meet our specs by adding a stainless steel wire mesh insert to the castings. The tooling costs are only a few hundred dollars, compared to tens of thousand of dollars for injection molding. And, the urethane castings are much lighter and more corrosion resistant than aluminum."

ROVs enable human operators to remain in safe, dry locations while instruments and tools on the vehicles perform underwater tasks. Uses for ROVs are as varied as constructing and maintaining sea floor oil wells, scanning underwater pipelines for cracks, and plucking the "black boxes" from submerged aircraft wrecks. The Quest's primary competitive advantages come from its seven electric thrusters, which are much more efficient than the hydraulic thrusters used by all other ROVs in the Quest's performance class. The thruster's electric direct drive eliminates many of the power conversion inefficiencies that are inherent in hydraulic propulsion.

Solid Concepts Inc.

Solid Concepts Inc. is a supplier of rapid prototyping, direct digital manufacturing, tooling and production molding services. Capabilities in PolyJet, SLA, SLS, QuantumCast™ cast urethanes, CNC and FRP prototypes and short run production parts. Tooling and Molding expertise to bring your project through to completion. ISO 9001 and AS9100 certified.