

DEEP OCEAN SIMULATION

For more than 50 years, Southwest Research Institute has been simulating extreme underwater conditions in a land-locked Ocean Simulation Laboratory in San Antonio. Facilities recreate the pressures and temperatures equipment must endure as a final quality and operational integrity check for clients in the oil and gas, ocean research, and naval or other defense industries. Pressure capabilities far exceed deep ocean conditions to simulate the geologic and wellbore environments that equipment must withstand. We also evaluate diving equipment as well as civilian and military submersible technology, including submarine rescue systems and the titanium hull of the Alvin research submersible. SwRI evaluates all types of equipment — from tubular goods to ROVs and even fishing lures — in high-pressure chambers, simulating deep ocean conditions to measure strength and durability and help avoid offshore catastrophes.



SwRI pressure tested this commercial submarine acrylic sphere in our **90-inch, 18-foot-deep** pressure chamber to ensure that it would withstand sea pressures without leaking.



Engineers used an array of strain gauges to evaluate the pressure hull and dome windows of this deep-sea **3-man** submersible tested in SwRI's high-pressure chamber.

PRESSURE TESTING

- Internal & external hydrostatic
- Stress analysis & instrumentation
- Electrical & hydraulic penetration
- Collapse & burst of:
 - API steel casing and line pipe
 - Fiberglass/other composite pipe
 - Valve bodies
- Verification of:
 - Prototype equipment
 - Pressure housings
 - Subsea instrumentation
 - Cables
 - Connectors
 - Oilfield equipment

**3 buildings/
18,000 square feet**

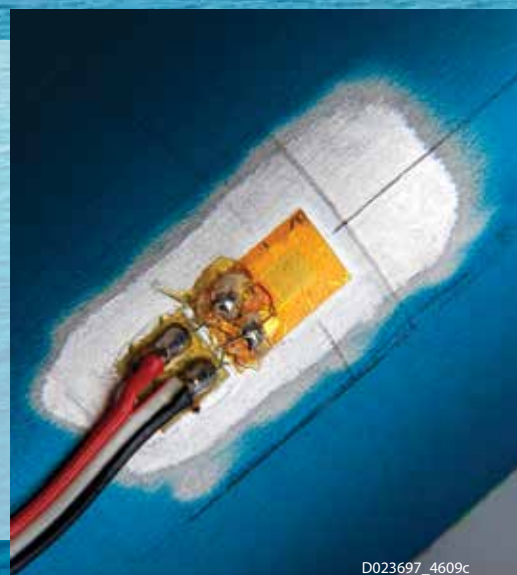


An excess of **60,000 psig**

internally burst this valve body at SwRI's remote outdoor testing facility.



SwRI has installed **1,000s** of strain gauges in the field combined with custom-configured data acquisition systems that assess the performance of components and materials both at the surface and under high pressures.



SwRI has **20 deep ocean pressure vessels**

- 2–90 inches internal diameter
- Up to 22 feet internal depth
 - 2,500–60,000 psi
 - 32–650° F



The Technology Today Podcast offers a new way to listen and learn about the technology, science, engineering and research impacting our lives and changing our world. Check out Episode 6 for a more in-depth discussion of deep ocean simulation with SwRI's Joe Crouch. <https://www.swri.org/podcast/ep6>