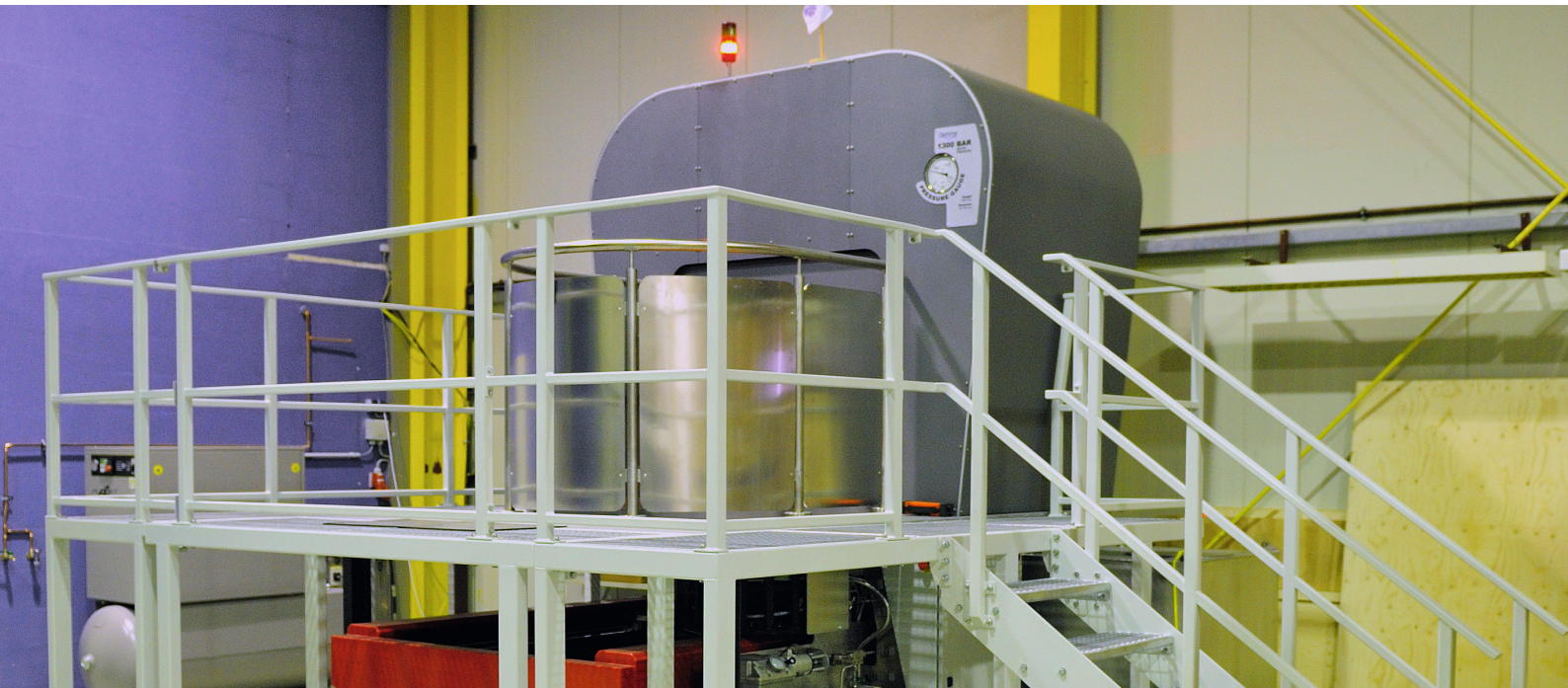


# VITROVEX® Hyperbaric Pressure Testing System



Pressure Testing Services by Nautilus Marine Service GmbH

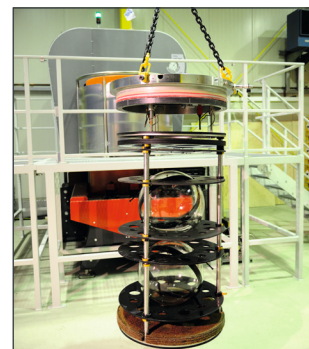


The VITROVEX® Hyperbaric Pressure Testing System simulates hydrostatic pressures found at depths up to 13,000 meters which is beyond the deepest known point on Earth, making it possible to test components which will explore the deep-sea trenches. It is primarily designed to meet the challenging demands for conducting tests on VITROVEX® glass enclosures and related products to ensure their integrity at rated depth. The pressure testing facility is superior to traditional pressure test facilities in terms of speed, accuracy and robustness. The system includes built-in safeties with secondary pressure containment, rapid turnaround time and electrical interfaces to test the assemblies while at pressure. The internal vessel dimensions are 0.7 meters in diameter and 1.4 meters in height.

## Pressure test facility of Nautilus Marine Service – at a glance:

- Pressure test to 1.300 bar (18.850 psi) in fresh or sea water
- Destructive tests
- Internal vessel dimensions: 700 mm diameter, 1,400 mm length
- Computer-controlled with diagnosis and quality control
- Short start-up period thru innovative lid design
- Customized pressure gradients and cycles sequences
- High degree of control accuracy (0.5 bar)
- Video monitoring and recording
- Electrical penetrations to the test object(s)
- Basket to accommodate enclosures with assorted sizes
- Hoist system capable of 5 tonnes
- Remote supervision and access
- Test certificates

**The Hyperbaric Pressure Testing System and accompanying services are available to outside clients at attractive terms.**



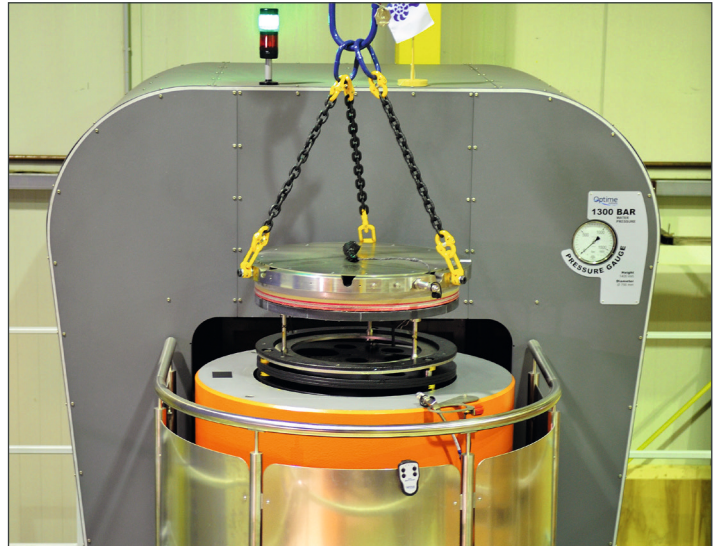


# VITROVEX® Hyperbaric Pressure Testing System



## Pressure Testing Services by Nautilus Marine Service GmbH

All deep-sea applications require high quality and pressure-resistant components. Although computer-based calculations and sophisticated simulation algorithms are available today and certainly help to shorten the development for such parts, only a test can really prove, that the design is according to specification, the right material has been chosen and that no signs of fatigue over the planned operation period will occur. Therefore, pressure tests are often mandatory as part of the certification process to be accomplished by a notified certification body.



**Hyperbaric testing is the only way to ensure the reliability of products working under subsea conditions or performing in high pressure situations. Hyperbaric pressure test facilities are used to simulate water depths and pressures to test and verify that products can operate safely under extreme pressurised conditions.**

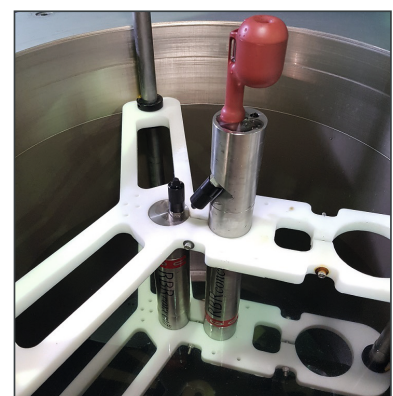
**Nautilus Marine Service, a renowned manufacturer of pressure housings made of glass, is specialized on delivering a wide range of pressure testing services and certification at attractive terms.**

Pressure testing can be conducted in-situ, but testing facilities provide more efficient environments with lower cost and carefully controlled conditions for such tests, as well as support for many different customers and applications. During pressure tests, the dynamic performance of a single component as well as of a complex assembly can be monitored and studied. As a result, existing designs can be improved before deployment or optimized after realization of any deficiencies in operation.

Conductivity sensors are sensitive to hydrostatic pressure, this sensitivity must be quantified to achieve high accuracy specifications. It is difficult and expensive to do this work with vessel-based deep-sea measurements. Using a constant salinity pressurized tank is the ideal experimental configuration to quantify the effect of hydrostatic pressure on the conductivity sensor. Salinity inside the pressure chamber can be set to customers' specifications to reflect the conditions in which the instruments will operate.



*Titanium pressure vessel with a rated depth of 600 bar failed at 574 bar. VITROVEX 7.5" glass instrumentation sphere with LED lights for video recorder in close proximity of the Titanium pressure vessel was not compromised by the implosion shock wave.*



*Sea water sensor calibration*