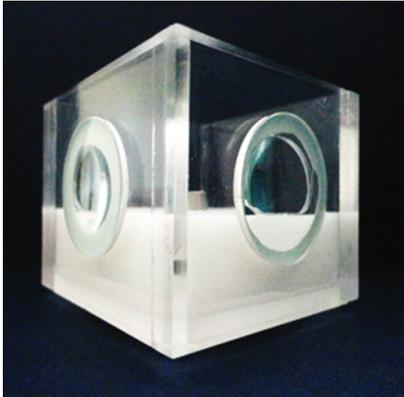




NAVAL RESEARCH LABORATORY

The Corporate Laboratory for the Navy and Marine Corps

Nano/Micro Mechanical Environmental Test Cell



The US Naval Research Laboratory detachment at Stennis Space Center has developed a device and method to conduct compression and tensile tests on soft materials such as flocculated sediments, biopolymers, biological materials, and food stuffs. The device facilitates compression tests of small particles in the 10 to 5000 micron range in the exact aqueous environmental conditions (e.g. pH, salinity, elevation) in which the sample is typically found. The device enables real-time imaging of the deformation process and is compatible with a variety of commercially available test frames and load cells.



The Navy's solution is faster and operates on much smaller sample sizes than competing solutions such as test flumes and cone penetrometers. The results of the measurement have great utility in discrete element models of fine-grain sediment transport to assess integrity of levees, embankments, and other structures. Other applications include biomechanical studies of tissues and composites, as well as testing of food items and cosmetics. The test cell design enhances test accuracy, and the magnified view ports facilitate rapid sample alignment and enable the ready capture of video or still photography in order to provide additional data sources.

Benefits

- **Efficient:** Produces faster quantification of compressive and elastic properties, requires much less sample material (~10 to 5000 microns), and offers a smaller device footprint than competing containers
- **Visual:** Real-time videography and photography of samples under compression or extension can be captured via built-in magnifying and clear windows; still and video captures can be analyzed later to address force curve changes
- **Simple Elegance:** Easily adapted to a variety of commercially available test frames and load cells via the environmental test cell's innovative conformable mounting platform design

Status and Opportunity

- US patent 8,984,957 and pending applications 14/574,619 and 14/620,515 are available for license
- Potential for collaboration with NRL Stennis Space Center researchers
- Additional information available at techlinkcenter.org/testcell

The US Navy's environmental test cell (above) is a fast, accurate, and simple way to conduct compressive and tensile tests on soft materials in a variety of commercial measurement systems