

# OCEANOGRAPHIC MOORING SYSTEMS

## COMPOUND SYNTHETIC SOLUTIONS



Cortland International's deepwater oceanographic mooring line systems secure many of the world's most critical data collection buoys. From offshore tsunami warning systems to long-term meteorological monitoring, our custom-engineered buoy mooring solutions are designed to maintain precise positioning in the harshest marine environments.

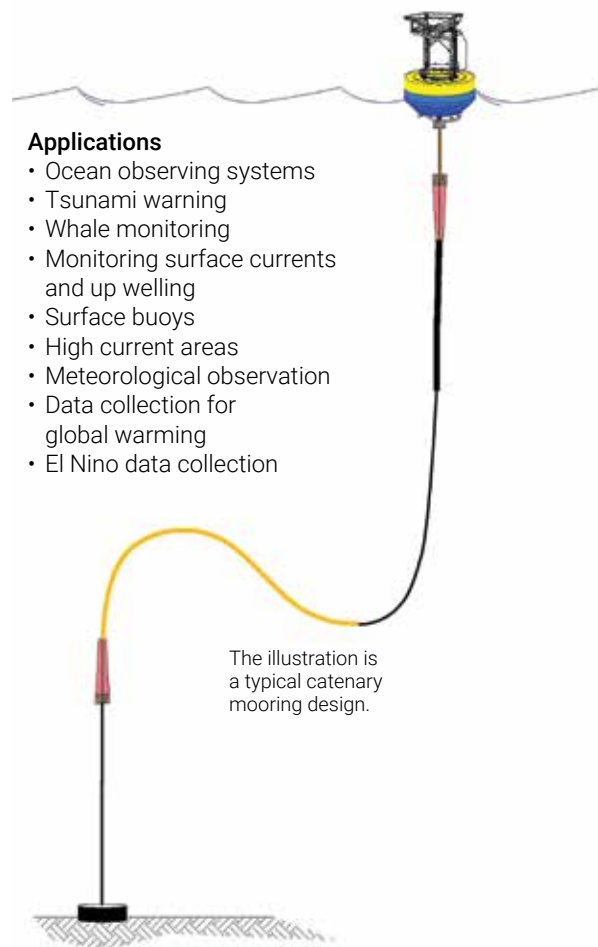
Each system is engineered to ensure optimal buoy performance, structural integrity, and secure station-keeping. Mooring sections can be manufactured to virtually any length and constructed from a broad range of high-strength, low-stretch, high-modulus synthetic fibers, as well as traditional nylon or polyester materials.

Sections may be designed with positive buoyancy or weighted configurations using lead-core technology to meet specific deployment requirements. Cortland's exclusive extruded jacket technology further enhances performance by reducing strumming and providing superior fish-bite protection.

As a global leader in custom deepwater mooring systems, Cortland combines advanced engineering expertise with large-scale manufacturing capabilities to deliver precisely tailored solutions for your most demanding applications.

### Applications

- Ocean observing systems
- Tsunami warning
- Whale monitoring
- Monitoring surface currents and up welling
- Surface buoys
- High current areas
- Meteorological observation
- Data collection for global warming
- El Nino data collection



The illustration is a typical catenary mooring design.

### Acoustic Doppler Current Profiler Tropical Atmosphere Ocean (TAO) Array Equatorial Moorings

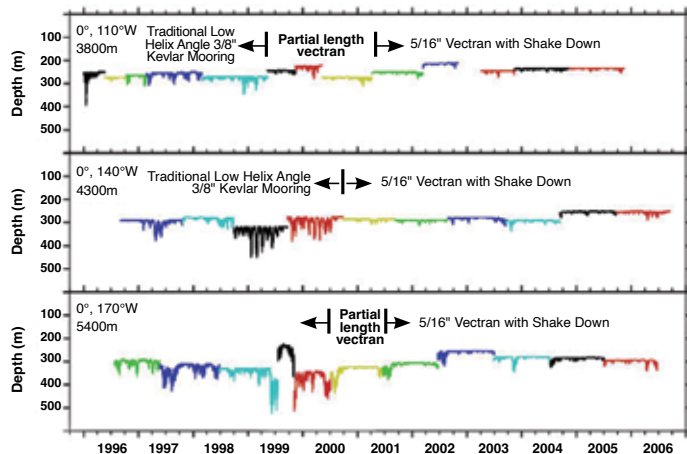


Chart furnished by NOAA, but does not constitute an endorsement of any commercial company or product.

In the 1990's, NOAA used traditional low helix angle Kevlar mooring lines on subsurface ADCP moorings. As this chart shows, vertical excursions of the subsurface mooring float, presumably due to drag on the mooring line, were at times relatively large. NOAA began switching to Vectran mooring lines with "Shake Down" extrusions in the late 90's and early 2000's. As this chart shows, the subsurface buoys experienced far less severe depth excursions after the change in mooring line.

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## Design Options

**Buoyant or Weighted Sections** – Depending on need, sections can be incorporated that are either positively buoyant or weighted. Weighted sections use an environmentally safe core of a “lead string” that is encapsulated in a watertight polyurethane jacket.

**Reduced Strumming\*** – Cortland’s exclusive Rumsey Ridge™ extruded jacket is designed to reduce strumming when towed through water or moored in high currents. Proven in over 20 years of field use, Cortland’s Rumsey Ridge extrusion technology is more durable than hair fairing and is less troublesome during winching operations.

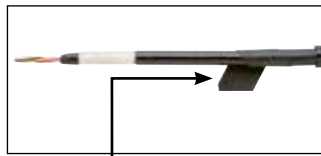
**Shake-Down Cable Profile** – There are many types of Shake-Down systems available. These profiles reduce water resistance to improve station keeping, minimize data “noise” interference and further limit strumming; these can be added to individual sections as needed. Towed mooring arrays also benefit from this technology.

**Fish Bite Protection** – Our manufacturing techniques create a protective system cover that can be added anywhere along the system length to prevent marine life damage.

**Jacket Marking** – Letters, numbers, or words can be printed on outer jackets for cable identification, and/or for depth measurement.



Fish bite pierced outer layer, but did not penetrate the aramid armor (*photo courtesy Woods Hole Oceanographic Institute*)



Aramid armor tape wrap for fish bite protection

**No Diameter Change Transition Zones** – Our manufacturing techniques can create a seamless transition between different system materials that eliminates bulky hardware connections. This reduces water flow resistance and allows for smooth deployment and retrieval operations.

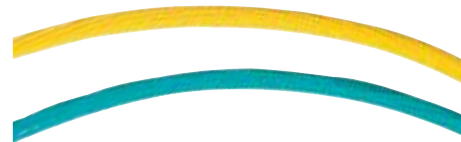
**Molded Eye Splice Terminations** – Factory installed eye splices eliminate field splices providing secure buoy and mooring anchor connection points.

**Taut or Catenary System Geometry** – Cortland can engineer taut (straight down) systems for depth control, or reverse catenary (curved) systems for high stretch and energy absorption applications.

**Electrical or Fiber Optic Functionality** – No matter what the specific needs of your mooring system are, Cortland can incorporate the necessary supplied cable into the mooring system.

\*Strumming: The vibration or “shake” of a cable caused by water flowing around it due to current or towing.

Email [contact@cortlandinternational.com](mailto:contact@cortlandinternational.com) for an initial discussion, or visit us online at [cortlandinternational.com](http://cortlandinternational.com).



Rumsey Ridge™ extruded jacket



Jacket marking



Transitions with no diameter change



Molded eye splice terminations