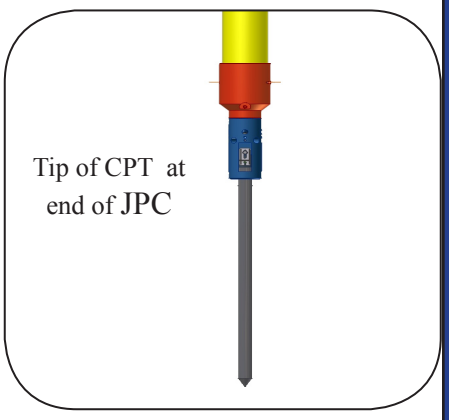
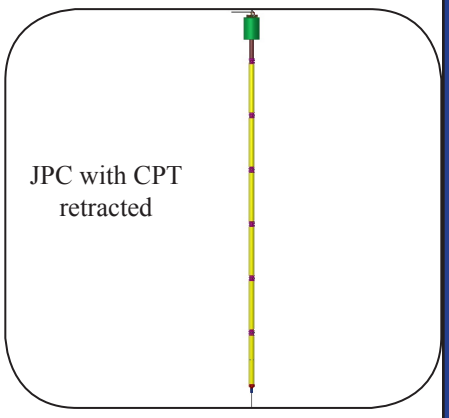
TDI-Brooks International, Inc.

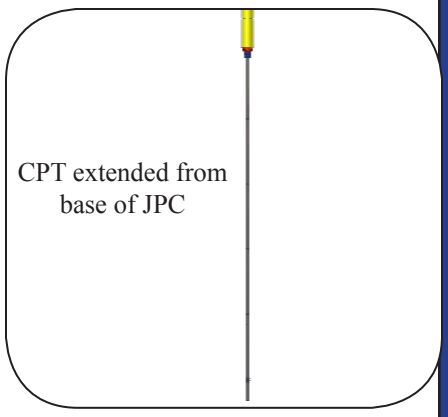
Scientific Services on a Global Basis

CPT Stinger

DEEPWATER STATIC CONE PENETROMETER





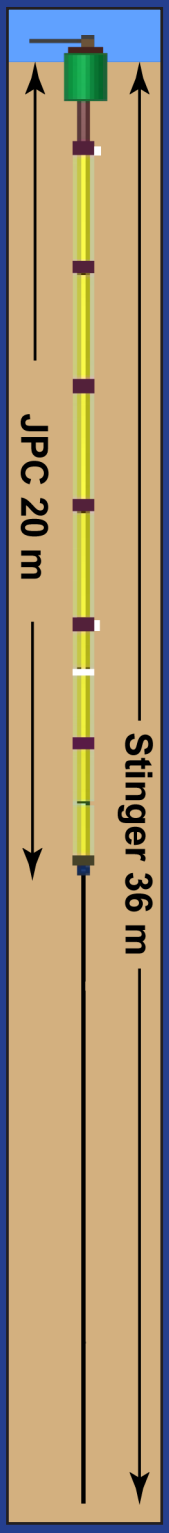


TDI-Brooks has developed a deepwater static cone penetrometer called a ***CPT Stinger***. When used in tandem with a Jumbo Piston Coring (JPC) rig, the ***CPT Stinger*** can acquire *in-situ* CPT data up to 16 more meters beneath the nose of the embedded JPC rig.

Jumbo Piston Coring (JPC) from mid-sized vessels is an accepted economical technique for gathering seabed sediment samples. The TDI-Brooks JPC system can penetrate 20 meters and retrieve up to 19+ meters of sediment column. Now, with the development of the TDI-Brooks CPT Stinger the JPC system can be used to push a cone penetrometer up to 16 more meters beneath the nose of the embedded JPC. As a result, *in-situ* CPT data can be acquired from sediment depths nearly double of that attainable from the JPC alone.

In practice, the standard JPC core liner is replaced by the ***CPT Stinger*** with its self-contained power, control, and logging module. The JPC is deployed in the same manner as if acquiring a Jumbo core. After trigger near the seabed, free-fall cone data can be acquired during the initial 3-second corer ballistic penetration into the seafloor. After penetration, the cone data acquisition continues for a programmed time. During this phase, the probe is extended deeper into the formation at a controlled rate of penetration of 2 cm/sec. Data from the probe are logged as the test progresses.

Once complete, the system is retrieved to the vessel and data are downloaded from the probe for evaluation and analysis. The control module is then serviced and the tool readied for the next deployment, typically in less than one hour, making multiple deep-water deployments per day feasible.



CONE SPECIFICATIONS

The cone measures: Tip Resistance, Sleeve Friction, Pore Water Pressure, Vertical Acceleration, X-Y Tilt

- The cone has a 15-cm^2 projected end area and conforms to ASTM International Designation: D 5778-07, Standard Test Method for Electronic Friction Cone and Piezocone Penetration Testing of Soils.
- The cone tip and its load cell are compensated for the hydrostatic pressure. This is essential for operations in deep water where the effective stress from soft soils is orders of magnitude smaller than the hydrostatic pressure. By this compensation, measurement accuracy is significantly enhanced.
- The cone sleeve has equal end areas and is inherently compensated. The sleeve load cell is hydrostatically compensated.
- Cones for two different soil-stiffness ranges are available:
- 5000-lb tip load cells for initial pushes into unknown soil conditions. The full scale output corresponds to a tip resistance of 310-ksf in sand and a soil shear strength (Nc =15) of 20.6-ksf in clays.
- 500-lb tip load cells for good resolution in soft soils. The full scale output corresponds to a tip resistance of 31-ksf in sand and a soil shear strength (Nc =15) of 2-ksf in clays.
- The maximum push of the Corer CPT unit is limited to the available reaction, which is 12,000-14,000-lbs. Using the high load cone for initial tests is designed to prevent damage to the low load cone.

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