COMPARTMENTALIZED STORAGE TANK (CST)

Partitioned Fluid Storage
Small Footprint
200-300 BBL Capacity
Easy Refill System
COMPARTMENTALIZED STORAGE TANKS

**CST – Modular Above-Deck**

CST on deck with 2-Pack rack. Side walkway, narrow configuration.

**Shell deepwater installation 2013;**
Custom configured CST storage tank.

This system allows for any combination of mud additives to be distributed directly to the hopper or mud pit without going above deck to open any valves or move any tote tanks.

- **Hopper in the sack room**
- **Active Mud Pit**
- **Pneumatically Actuated Valves for remote control.**
**Noble Drillship installation 2013;**
Custom configured modular storage tanks.

This system allows for any combination of mud additives to be distributed to four separate mud pits or hoppers.

Rack on deck

Sight glass equipped for accurate fluid measurement.
• **Built with 4 or 6 storage compartments.**
• Designed for the storage of bulk chemicals for drilling fluids.
• **Package Includes:** CST, RACKS, TOTE TANKS, HOSES and ACCESSORIES.
• Built in 100 bbl and 200 bbl capacities.
• Our tote tanks combined allows for a quick-drain into the CST
• **Coast Guard Certified** storage vessel.
• **PATENT # 6,915,815**

Dimensions: W 8’ x L 16’ x H 10’
Weight: 23,000 lbs Empty, 98,000 lbs Full

**Advantages:**

**Saves Deck Space**
- 8’ x 18’ foot print holds 200 bbls of volume (10’ x 18’ with stairs and walkway).
- Takes the place of 15 totes (550 gallon) of volume in the same foot print.

**Reduces Crane Lifts**
- Allows for 4 totes at a time to be drained and put back on the boat.
- Avoids having to handle tote tanks multiple times before it is emptied.

**Chemical Storage**
- Each intake and discharge port is labeled and color coded.
- Up to six different drilling and completion fluid additives can be stored
- All hoses use 2” cam lock fittings.
- Every tank has an inspection plate for measuring volume.
- Tanks are sloped on the bottom to drain to a minimal dead volume.
- Valves are protected by drip pan.

**Health, Safety, and Environmental**
- Intake and discharge valves have full drip pans to prevent spills and slip hazards.
- Tanks can be cleaned from the top without putting personnel in confined space.
- Built with OSHA approved stairs and walkway.
- By reducing the number of lifts needed for moving tote tanks, the risk to rig personnel is reduced.
One-time connections with integrated drip pan for fluid containment.

**Safety:** Eliminate deck clutter

**Organize:** No loose totes to juggle

**Time:** Avoids handling totes multiple times before being emptied.
**COMPARTMENTALIZED STORAGE TANK (CST)**

<table>
<thead>
<tr>
<th><strong>4 pack transport rack atop CST on rig</strong></th>
<th><strong>Discharge Hoses and Hose Hold Downs</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>![Image](708x36 to 756x576)</td>
<td>![Image](389x73 to 492x210)</td>
</tr>
<tr>
<td><strong>Additional Information</strong></td>
<td><strong>Intake and discharge valves have full drip pans to prevent spills and slip hazards</strong></td>
</tr>
<tr>
<td>The tank measures 8’ wide by 18’ long. This accounts for the 2’ stairway and drip pan in the front of the tank. The overall height with handrails and landing rack is 15’ high. The tank weighs 23,000 lbs. and holds 200 bbl of fluid. The tank can hold up to a 14.5 lbs. fluid.</td>
<td>Each intake and discharge port is labeled and color-coded</td>
</tr>
<tr>
<td>There are from 1 to 6 compartments depending on configuration within the storage tank. <strong>There are 2-pack or 4-pack transport racks with associated 13 bbl totes to refill tank. This is an additional 104 bbls of fluid. This can be a 300 bbl package.</strong></td>
<td></td>
</tr>
<tr>
<td>All compartments are color coded and lettered. The tote tanks are designated per assigned compartment.</td>
<td>Every tank has an inventory port for measuring volume</td>
</tr>
</tbody>
</table>
Stage and Fill

- Staged for shipping
- Easy hose connections
- 6-Chemical fill ports per corner

Discharge – Easy, Safe Connections to the mud room through deck penetrations.

- Side Discharge Option
- Optional Manifold/Metering System
- Below deck lines run into mudroom
- Direct discharge to the mudroom
Note: 300 bbl capacity is possible with our full CST package: 8 totes carrying fluid plus the CST tank itself.
CST can be equipped with load distribution “wings” to lower the stress on the deck.
Custom options available to fit your rig needs. DNV, custom stairs, custom widths, custom heights, 2-Pack, 4-Pack, modular . . .

Call us and we’ll help find a solution to fit your needs.

End Stairs

Side-Mount Stairs

Dual Stairs

Narrow DNV Version
A mass flow meter, also known as an inertial flow meter or a coriolis flow meter, is a device that measures mass flow rate of a fluid traveling through a tube. The mass flow rate is the mass of the fluid traveling past a fixed point per unit time.

Fluid is contained in a smooth tube, with no moving parts that would need to be cleaned and maintained, and that would impede the flow.

Virtually all fluids can be measured: cleaning agents and solvents, fuels, drilling mud additives, vegetable oils, animal fats, latex, silicon oils, alcohol, fruit solutions, toothpaste, vinegar, ketchup, mayonnaise, gases, liquefied gases, etc.

One for all - multivariable metering. The ability to measure several process variables all at the same time opens up completely new application fields. Mass flow, density and temperature (the primary measured variables) can be used to derive other variables such as volume flow, solid contents, concentrations, and complex density functions.
## Example CST Packages and Typical Usage for Compartments and Totes assigned to Rigs

<table>
<thead>
<tr>
<th>BP Holstein</th>
<th>BP Enterprise</th>
<th>BP Enterprise Completion</th>
<th>Shell Nautilus</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RACKS: 18, 43</strong></td>
<td><strong>RACKS 481, 476</strong></td>
<td><strong>RACKS: 548, 524, 504</strong></td>
<td><strong>RACKS: 404, 454</strong></td>
</tr>
<tr>
<td>Surethin TT61-58</td>
<td>RheFlat TT15-626DV</td>
<td>Surewet TT15-638DV</td>
<td>Surewet TT15-674</td>
</tr>
<tr>
<td>Suremul TT62-154</td>
<td>RheThik TT15-610DV</td>
<td>SyntheticB</td>
<td>RheFlat TT15-610DV</td>
</tr>
<tr>
<td>Surewet TT81-75, 112-152</td>
<td>RheBuild TT15-659</td>
<td>MPT TANKS</td>
<td>RheBuild TT15-650DV</td>
</tr>
<tr>
<td>Safesurf O TT11-34, 11-35</td>
<td>RheDuce TT-15-609</td>
<td></td>
<td>RheFlach TT15-634DV</td>
</tr>
<tr>
<td><strong>Shell Spirit</strong></td>
<td><strong>Shell Jim Thompson</strong></td>
<td><strong>Chevron 7500</strong></td>
<td><strong>Please contact Dan Ness if you need any additional information or decals.</strong></td>
</tr>
<tr>
<td><strong>RACKS: 45, 321</strong></td>
<td><strong>RACKS: 752, 758</strong></td>
<td><strong>RACKS: 95, 304</strong></td>
<td><strong>All CST Drilling Packages consist of 2 “4” Pack Racks and 8 Totes.</strong></td>
</tr>
<tr>
<td>RheFlat TT 46-919</td>
<td>RheFlat TT15-690</td>
<td>*Suremod TT15-636</td>
<td>*Suremod TT15-636</td>
</tr>
<tr>
<td>RheThik TT 46-961</td>
<td>RheDuce TT 15-662DV</td>
<td>*Surethin TT15-646DV</td>
<td>*Surethin TT15-650DV</td>
</tr>
<tr>
<td>RheDuce TT 46-951DV</td>
<td>TT 15-634DV</td>
<td></td>
<td>Surethin TT15-650DV</td>
</tr>
<tr>
<td>RheBuild TT 46-939DV</td>
<td>SafeSurf O TT 15-642DV</td>
<td></td>
<td>RheFlat TT15-674</td>
</tr>
</tbody>
</table>

Please contact Dan Ness if you need any additional information or decals.

All CST Drilling Packages consist of 2 “4” Pack Racks and 8 Totes.

BP Completion has 3, “2” Pack Racks and 6 Totes.
United States

PATENT # 6,915,815

COMPARTMENTALIZED STORAGE TANK (CST)

July 12, 2005

Inventor:
Daniel Ness