Closed Coke Slurry System (CCS System)

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The Future In Coke Handling...

The Closed Coke Slurry System
What Can You Expect From The

Closed Coke Slurry System...?

A Step Change in Coke Handling Operation
Between Cutting And Coke Load-Out

And These Are The Benefits...

- State-Of-The-Art Design For Zero-Dust-Coker, VOC- & Steam-Releases
- Fluidized Operation --- Similar To Many Refining Processes
- Effective Fines- & Water-Management / No Silt Disposal
- Unparalleled System Reliability (98+%) Through Unique Design Features & Material Selection
- Low Manpower Requirements Through Instrumentation & Logic Control Features
- Flexible To Suit Retrofitting & Grassroots Coker
Closed Coke Slurry System (CCS System)

Drum Decoking + Coke Dewatering

Clear Water Tank

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Closed Coke Slurry System (CCS System)

Dewatering Cycle
Unique System Components Provide Safe and Reliable Operation

Crusher With Shute (Proprietary Design)
- Double Roll With Independent Direct Drive
- Fully Automatic Operation through DCS architecture
- Roll dimensions / Teeth Pattern Developed For Peak- & Impact Loads
- Dedicated Crusher for each Drum is recommended
- Unlimited Swallow Capacity For Any Cutting Rates & Coke Quality
- Crushing Ratio 10:1 e.g. 1.000 mm To 100 mm ; 40” To 4” resp.
- Triple Casing Material Combination For Long Life Cycle - Overall Wall Thickness 2”
- Safe Operation: Shute Hydraulically Raised & Automatically Docked to Drum Flange or Bottom Valve

Slurry Pump
- Special Design For “Ultra Low NPSH” Operating Conditions
- Unique Material Selection For Extended Life Cycle

Closed Slurry Pipe
- Special Design For Optimum Slurry Fluidization - Non Clogging –
- Design is a function of velocity, layout and experience - non trench type -
- Special Material Selection & Construction For Extended Life Cycle
**Dewatering Bins** (Proprietary Design)

Fast And Efficient Entrainment Through...

- Pure Gravity Flow – No movable Devices
- Screen Design With Maximum Surface Arrangement
- Cone Section Fully Perforated For Uniform Dewatering of Wet Feet
- Overall Short Travel Distance For Free Water Entrainment

- more than 6 Years uninterrupted operation
- more than 99,5 % fines retention in Coke bed

**Typical Cycle Schedule** (2 Drum Unit – 1.000 to Coke/Drum)

<table>
<thead>
<tr>
<th>CLOSED COKE HANDLING SYSTEM</th>
<th>hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drum Decoking…</td>
<td>3</td>
</tr>
<tr>
<td>Coke Crushing (In-line)</td>
<td>3</td>
</tr>
<tr>
<td>Coke Dewatering in the Dewatering Bin</td>
<td>7</td>
</tr>
<tr>
<td>Coke Transport/ Loading</td>
<td></td>
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</tbody>
</table>

Duration, total: 7 hours
How Will The Closed Coke Slurry System Be Implemented?

**Retrofitting** e.g. Replacement for Open Pit

- Suitable For Multi-Drum Coker
- Layout Planning / Equipment Installation by Considering the Than Idle Coke Pit
- Revamp Time / Implementation Within Scheduled Envelope for Coker Turnaround

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**Capital Projects**

- Early Involvement into Planning Phase Allows Smooth Approval Procedures with Authorities, Substantial Capital Cost Savings & Economic Improvements Upfront

- Eases Authorities Concerns During Project Approval Phase
- Streamlined Cycle Design Enables Shorter Cycle Time
- Shorter Payout period with High Unit Reliability (98+%)  
- Substantial Reduction of Planned Manpower
- Omission of Investment In Pit & Overhead Cranes
- Lower Structure Elevation/ Less Steelwork
Main Advantages of the CCS-System At a Glance…

- Workers Health / Inherent Hazards / Workplace Safety & Environment
  - The CCS-System Eliminates Concerns from EPA / OSHA, Local Authorities, Environmental Agencies or other Sources

- State-Of-The-Art Process
  - Reference Unit for Zero-Dust Coke handling and Equipment Reliability (98+%) For Years to come

- Manpower
  - Minimum Manpower through Instrumentation with Logic Steps
  - High Workers Acceptance to Similarities with other Refining Processes

- Fines & Sludge handling
  - Efficient Separation & Removal of Fines (No External Silt) To Produce Excellent Cutting Water Quality by Extended Equipment Life Cycle

- Reliability
  - Unique Proprietary Material Selection & Combination For Trouble Free, Uninterrupted Operation Between Planned Turnarounds
  - Reference Unit in Continuous Operation for 6 Years
Experience Facts on an existing Unit with over 6 Years Operation

➢ No Field Operators
➢ No Maintenance - only Inspection for the Crusher Lube Oil Unit
➢ 6 Years Operation equivalent to 3,000 Cycles
➢ 1,000 to of Petrol Coke per Cycle
➢ No Deterioration in the Cutting Water Pump Performance
➢ No Corrosion and Erosion in the total CCS System
➢ No Incidents
➢ Delivers Commercially dry Coke with 14% Humidity on a Constant Basis
➢ only 0.5% (5 to) of Coke Fines appears in the Water Settling Tank

Thanks for your attention

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