Xtract- Waste water treatment

Offshore oil in water removal below 1 ppm

Xtract is a further development of the Xpel series of oil in water removal systems for offshore applications. It consists of a compact containerized unit designed for treating slop, waste waters, and produced water offshore. The highly effective separation technology involves a unique membrane filtration process that avoids the build-up of filtrate blockages and results in close to zero ppm discharges. Xtract is built into a 13 ft container in compliance with the NORSOK Z-015 standard and is approved for ATEX II/3G.
Applications

- Oily water treatment during cleaning operations
- Slop water treatment during drilling operations
- Produced water treatment

Technology

Feed water is pumped through a system of ceramic rods containing an array of tangential passages through which the oily water passes through. The rods are coated with a hydrophilic membrane, such that water passes through the membrane to the outside of the rod while leaving Hydrocarbons and particulates to be discharged through the tangentially arranged passages. This process ensures that no blockages occur and that the separation is 100% effective.

Benefits

1. Treated discharge water - less than 1 ppm oil
2. No use of flocculent chemicals
3. 98% waste reduction on treated waste water streams.
4. Treatment capacity 10m3/hr for standard system
5. Easily upgradable for larger feed volumes.
6. Standard footprint - 13 ft container
7. No downtime (built in process redundancy)
8. Programmable - no need for 24 hr personnel operation.
Typical setup

![Diagram of typical setup](image)

Clean water to sea

Report

IKM Production Technology will deliver daily report, with treated volume, average PPM and total waste reduction.

### 1. GENERAL DETAIL
- **Customer:**
- **Location:**
- **Rig:**
- **Contractor:**
- **Well:**
- **Type of fluid:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Reporting Period</th>
<th>Rig</th>
<th>Hole Section</th>
<th>Contractor</th>
<th>Start Depth [m]</th>
<th>Estimated TD Depth [m]</th>
<th>Start Depth [m]</th>
<th>Estimated TD Depth [m]</th>
</tr>
</thead>
<tbody>
<tr>
<td>15.06.2015</td>
<td></td>
<td>00:00-24:00</td>
<td></td>
<td>N/A</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
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</tbody>
</table>

### 2. OPERATION

#### Daily Reserve 5 tank monitoring
- **Current standing Res 5 [m³]**
- **Total pr. Month [m³]**
- **Waste reduction in Total**

<table>
<thead>
<tr>
<th>Date</th>
<th>January</th>
<th>February</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>Juni</th>
<th>Daily Reserve 5 tank monitoring</th>
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</thead>
<tbody>
<tr>
<td>28.01.2015</td>
<td>1.363</td>
<td>1.291</td>
<td>1.370</td>
<td>572</td>
<td>851</td>
<td></td>
<td>60</td>
</tr>
<tr>
<td>11.02.2015</td>
<td>0.56</td>
<td>0.54</td>
<td>1.03</td>
<td>0.72</td>
<td>0.68</td>
<td></td>
<td>0</td>
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<tr>
<td>16.03.2015</td>
<td>31</td>
<td>45</td>
<td>31</td>
<td>24</td>
<td>54</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>17.04.2015</td>
<td>0.5 mg/l</td>
<td>0.5 mg/l</td>
<td>0.5 mg/l</td>
<td>0.5 mg/l</td>
<td>0.5 mg/l</td>
<td>0</td>
<td>0.5 mg/l</td>
</tr>
<tr>
<td>13.05.2015</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

#### Waste Water Treatment Unit
- **Type**
- **Monthly Sample Verification**
- **Average PPM Feed [Inlet]**

<table>
<thead>
<tr>
<th>Date</th>
<th>Type</th>
<th>Serial No:</th>
<th>Daily Hrs. run</th>
<th>Tot. Hrs. run</th>
<th>Daily downtime</th>
</tr>
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<tbody>
<tr>
<td>709-2011</td>
<td>HATR-T2</td>
<td></td>
<td>0</td>
<td>5914</td>
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</tbody>
</table>

#### Monthly Sample Verification
- **Date**
- **Value**

<table>
<thead>
<tr>
<th>Date</th>
<th>Discharged to sea [m³]</th>
<th>Average PPM</th>
<th>Waste sent onshore [m³]</th>
<th>Estimated TD Depth [m³]</th>
<th>Total Waste Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>28.01.2015</td>
<td>1.363</td>
<td>0.56</td>
<td>31</td>
<td>N/A</td>
<td>95.7 %</td>
</tr>
<tr>
<td>11.02.2015</td>
<td>1.291</td>
<td>0.54</td>
<td>45</td>
<td>N/A</td>
<td>0</td>
</tr>
<tr>
<td>16.03.2015</td>
<td>1.370</td>
<td>1.03</td>
<td>31</td>
<td>N/A</td>
<td>0</td>
</tr>
<tr>
<td>17.04.2015</td>
<td>572</td>
<td>0.72</td>
<td>24</td>
<td>N/A</td>
<td>0</td>
</tr>
<tr>
<td>13.05.2015</td>
<td>851</td>
<td>0.68</td>
<td>54</td>
<td>N/A</td>
<td>0</td>
</tr>
</tbody>
</table>

### 3. TOTAL TREATMENT OF WASTE WATER CURRENT MONTH

<table>
<thead>
<tr>
<th>Average PPM Feed [inlet]</th>
<th>Average PPM of water to sea</th>
<th>Daily discharge to sea [m³]</th>
<th>Total oil to sea [Litres]</th>
<th>Total discharge to sea [m³]</th>
<th>Total untreated sent onshore [m³]</th>
<th>Total Waste Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>no measurement</td>
<td>0.41</td>
<td>0.0</td>
<td>0.07</td>
<td>179.0</td>
<td>8.0</td>
<td>95.7 %</td>
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</tbody>
</table>
Specifications

CONTAINER
Size / weight 12ft / 9000 kg

MAIN POWER SUPPLY
Voltage 690 V / 60Hz

PROCESS
Capacity 10m3/h
Design pressure 10 Barg
Intake temperature max 90 deg C
Design pH 2 - 12 pH
Material 316 L
Oil in Water Monitor Infracal TOG / TPH Analyzer

CERTIFICATION
Explosion Protection ATEX II / 3G
Container DNV 2.7.1
Equipment CE-Labelling
General Design Norsok Z-015
General Design Norsok S-002

CONSUMPTIONS
Power 120 kW

Patent

IKM Production Technology waste water unit is equipped with patented solutions for keeping Uniform Transmembrane Pressure.

Our Services

Reservoir fluid analysis
PVT
Chemical composition
Trace elements
Corrosion
Laboratory chemists - rental

Sample bottle rental
PVT - High pressure downhole samples
PVT-Surface samples
Long term storage
Flow assurance

Reservoir fluid sampling
PVT - Separator and wellhead
Isokinetic
Downhole - cased and open
Single phase
Mini phase-separator
High pressure sample transfer

Production Surveillance / Well Integrity
Memory gauge
Leak monitoring - annulus and tubing
Wireless Surface data acquisition

Drilling Waste Management
Oily wastewater
Produced Water
Cuttings Handling

Workshop services
High pressure equipment maintenance
Pressure testing
Fittings training
Sample bottle recertification and maintenance