In the heavy oil environments where steam-assisted gravity drainage (SAGD) techniques are often used, operators face unique challenges for efficient recovery. Successful balancing of steam injection and liquid production is vital for promoting a minimal steam-to-oil ratio (SOR) and helping to maximize reservoir deliverability.

Halliburton EquiFlow® inflow control devices (ICDs) in SAGD operations help improve completion performance and efficiency by balancing inflow throughout the length of a completion.

The EquiFlow ICD consists of an annular chamber on a standard oilfield tubular. Reservoir fluid is produced from the formation, run through the sand screen and then into the flow chamber. The flow continues through a set of nozzles, creating a pressure drop, and then into the pipe through a set of perforations in the basepipe. The ICD setting is predetermined and set at manufacturing allowing for a slim design. EquiFlow ICDs can be either liner deployed or tubing deployed and can be paired with any sand screen.

**Features**
- No moving parts
- No elastomers
- Used primarily as production capability
- Injection capable

### EquiFlow® ICD Technology

<table>
<thead>
<tr>
<th>Basepipe OD</th>
<th>3 ½ in.</th>
<th>4 in.</th>
<th>4 ½ in.</th>
<th>5 in.</th>
<th>5 ½ in.</th>
<th>6 5/8 in.</th>
<th>7 in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICD OD</td>
<td>4.625 in.</td>
<td>5.125 in.</td>
<td>5.625 in.</td>
<td>6.125 in.</td>
<td>6.625 in.</td>
<td>7.75 in.</td>
<td>8.125 in.</td>
</tr>
<tr>
<td>Standard Metallurgy*</td>
<td>316L</td>
<td>316L</td>
<td>316L</td>
<td>316L</td>
<td>316L</td>
<td>316L</td>
<td>316L</td>
</tr>
<tr>
<td>Standard Temperature Rating</td>
<td>520°F (271°C)</td>
<td>520°F (271°C)</td>
<td>520°F (271°C)</td>
<td>520°F (271°C)</td>
<td>520°F (271°C)</td>
<td>520°F (271°C)</td>
<td>520°F (271°C)</td>
</tr>
</tbody>
</table>

*Additional metallurgies available upon request
EquiFlow ICD for SAGD Producer

For SAGD producers, inflow must be balanced to minimize steam breakthrough and allow the normal production of oil and condensate. Traditional slotted liner and standalone screen completions are not able to properly balance the inflow and can experience steam erosion as a result of an uncontrolled steam breakthrough. EquiFlow ICDs help balance inflow, which can prevent and minimize steam breakthrough and erosion issues, and allow the well to operate more efficiently at lower subcool temperatures while yielding greater bitumen recovery.

EquiFlow ICD for SAGD Injector

For SAGD injectors, steam must be balanced to account for varying pay zone thickness, reservoir heterogeneity, and heel-toe tubing frictional effects. An optimized steam chamber allows for maximized bitumen recovery, versus the dual tubing heel-toe injection method, which is not capable of properly balancing the steam chamber and often develops a “barbell” chamber. EquiFlow ICDs can be used as an outflow control device to provide the proper outflow balance.

For more information, contact your local Halliburton representative or email us at completions@halliburton.com.

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