VACUUM INSULATED TUBING
VIT

DAiSSA
PETROLEUM
Vacuum Insulated Tubing (VIT)

Structure:
- Host String
- Thermocase
- Coupling
- Sealing Ring
- Liner Pipe
- Double-walled Enclosed Welded Structure
- No prestressing

Multi-layer insulation structure in the annulus space and getter in the thermocase
- Reduce heat transfer
- Reduce energy loss by convection and radiation
- Protect hydrogen explosion
- Prolong the service life with special handicraft treatment
THE DEVELOPMENT OF INSULATED TUBING

- **GENARACIÓN 5**: Supercritical Insulated Tubing (SIT)
- **GENERACIÓN 4**: Vacuum Insulated Tubing (VIT)
- **GENERACIÓN 3**: Anti-hydrogen Insulated Tubing
- **GENARACIÓN 2**: Prestressed Insulated Tubing
<table>
<thead>
<tr>
<th>Item</th>
<th>YG88×40</th>
<th>YG88×50</th>
<th>YG114×62</th>
<th>YG114×76</th>
<th>YG127×62</th>
<th>YG127×76</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Parameters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(N80) OD of External Pipe / Thickness</td>
<td>3.5 /</td>
<td>3.5 /</td>
<td>4.5 /</td>
<td>4.5 /</td>
<td>5 /</td>
<td>5 /</td>
</tr>
<tr>
<td>of pipe wall (in)</td>
<td>0.254</td>
<td>0.254</td>
<td>0.250</td>
<td>0.250</td>
<td>0.362</td>
<td>0.362</td>
</tr>
<tr>
<td>(N80) ID of Internal Pipe / Thickness</td>
<td>1.610 /</td>
<td>1.995 /</td>
<td>2.441 /</td>
<td>2.992 /</td>
<td>2.441 /</td>
<td>2.992 /</td>
</tr>
<tr>
<td>of pipe wall (in)</td>
<td>0.145</td>
<td>0.190</td>
<td>0.217</td>
<td>0.254</td>
<td>0.217</td>
<td>0.254</td>
</tr>
<tr>
<td>(N80) OD of Coupling (in)</td>
<td>4.25</td>
<td>4.25</td>
<td>5.2</td>
<td>5.2</td>
<td>5.563</td>
<td>5.563</td>
</tr>
<tr>
<td>Connecting threads</td>
<td>3-1/2</td>
<td>3-1/2</td>
<td>4-1/2</td>
<td>4-1/2</td>
<td>5BCSG</td>
<td>5BCSG</td>
</tr>
<tr>
<td>USS</td>
<td>USS</td>
<td>USS</td>
<td>BCSG</td>
<td>BCSG</td>
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<td>BCSG</td>
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</tbody>
</table>

Key Performance parameters

<table>
<thead>
<tr>
<th>Item</th>
<th>YG88×40</th>
<th>YG88×50</th>
<th>YG114×62</th>
<th>YG114×76</th>
<th>YG127×62</th>
<th>YG127×76</th>
</tr>
</thead>
<tbody>
<tr>
<td>apparent thermal conductivity (W/m·℃) At 350℃ Inside Wall of Internal Pipe</td>
<td>0.08~0.006 (SY/T5324-94: A, B, C, D)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>resistance to tension load at Normal Temp (lb)</td>
<td>90373.19</td>
<td>97117.46</td>
<td>113753.3</td>
<td>120722.4</td>
<td>127916.3</td>
<td>138257.5</td>
</tr>
<tr>
<td>resistance to internal pressure (psi)</td>
<td>Normal Temp</td>
<td>4641.06</td>
<td>4641.06</td>
<td>4641.06</td>
<td>4641.06</td>
<td>4641.06</td>
</tr>
<tr>
<td></td>
<td>Steam Injection</td>
<td>3045.69</td>
<td>3045.69</td>
<td>3045.69</td>
<td>3045.69</td>
<td>3045.69</td>
</tr>
<tr>
<td>resistance to external pressure (psi)</td>
<td>Normal Temp</td>
<td>4350.99</td>
<td>3770.86</td>
<td>3770.86</td>
<td>3335.76</td>
<td>3335.76</td>
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<tr>
<td></td>
<td>Steam Injection</td>
<td>4060.92</td>
<td>3480.79</td>
<td>3480.79</td>
<td>3045.69</td>
<td>3045.69</td>
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<tr>
<td>straightness (%)</td>
<td>≤0.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Service parameter

| Temperature (°F)                          | Regular Service | 662     |
|                                          | Overheating(3-4h) | 716     |
| Cementing casing (in)                    | HW | 5-1/2 | 7 | 9-5/8 |
# SUPERCritical INSULATION TUBING

<table>
<thead>
<tr>
<th>item</th>
<th>Specs.</th>
<th>SG114×62</th>
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</thead>
<tbody>
<tr>
<td><strong>Basic Parameters</strong></td>
<td></td>
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</tr>
<tr>
<td>(P110) OD of External Pipe /Thickess of pipe wall (in)</td>
<td>4.5/0.271</td>
<td></td>
</tr>
<tr>
<td>(P110) ID of Internal Pipe/ Thickness of pipe wall (in)</td>
<td>2.44/0.217</td>
<td></td>
</tr>
<tr>
<td>(P110) OD of Coupling (in)</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Unit weight (lb/ft)</td>
<td>18.82</td>
<td></td>
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<tr>
<td>Connecting threads</td>
<td>BCSG</td>
<td></td>
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<tr>
<td>apparent thermal conductivity (W/m·℃) (At 350℃ Inside Wall of Internal Pipe)</td>
<td>≤0.04</td>
<td></td>
</tr>
<tr>
<td>resistance to tension load at Normal Temp (lb)</td>
<td>123645</td>
<td></td>
</tr>
<tr>
<td>resistance to internal pressure (psi)</td>
<td>Normal Temp</td>
<td>6526</td>
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<tr>
<td>Steam Injection</td>
<td>5800</td>
<td></td>
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<tr>
<td>resistance to external pressure (psi)</td>
<td>Normal Temp</td>
<td>7251</td>
</tr>
<tr>
<td>Injection</td>
<td>Steam</td>
<td>5656</td>
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<tr>
<td>Straightness(%)</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td><strong>Key Performance parameters</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>service parameter</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Well Depth (ft)</td>
<td>7546</td>
<td></td>
</tr>
<tr>
<td>Temperature (°F)</td>
<td>734</td>
<td></td>
</tr>
<tr>
<td>Cementing casing (in)</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>
**VIT MANUFACTURING PROCESS FLOWCHART**

**Inner Tube**
- Heating & Degassing
- Wrapping
- Slipping

**Outer Tube**
- Pipe Supply
- Up-setting
- Get rid on the rust on ou. wall
- Machining Air Hole
- Get rid on the rust on in. wall
- Flat Face
- Overall Test

**Pipe Supply**
- Threading End I
- Apparent Thermal Conductivity Test
- Pumping & Butt Welding
- Thermal Elongation
- Welding Line Defect Detection
- Welding End II

**End II**
- Threading
- Stamp Machining
- Makeup Coupling
- Overall Test
- Drift Diameter Test
- Makeup Thread Protector
- To Be Continued

**Shipping**
- Coating & Marking
- Packing
- Shipping

Offshore & Downhole Technology
Houston, Texas 77386
330 Rayford Rd.
www.daissapetroleum.com
THE LOOK OF WORKSHOP

- Insulated Tubing Line
- Threading Processing
- Painting & Coating
- Upsetting Workshop for Inner Tube
THE MAIN MANUFACTURING PROCESSES

- Heating and Degassing
- Prestressed Welding
- Heating, Vacuum-Pumping & Vacuum Welding
- Threading
MEDIDAS DE INSPECCIÓN

• Quality Control Center
  – 24 professional inspectors
  – More than 50 advanced measuring instruments

• Testing the Apparent Thermal Conductivity of VIT
  – Steady state method
  – Monitored data by computers

• Using the Integrative Test Device
  – Test integral resistance to tension
  – Resistance to internal pressure
  – Resistance to external pressure
  – Straightness.
SALE PERFORMANCE

• Annual manufacturing capacity
  – More than 300,000 meters of VIT.

• Current Acumulated
  – About 3.0 million meters tubing in total.
  – Our tubing is used in many oilfields.

• The products are also exported
  – Syria, Oman, Argentina, Canada, USA, etc.
VIT IN SITE
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