Hydrogen generation plant based on methanol reforming – HYDROFORM-M

Mahler AGS hydrogen plants based on methanol reforming process meet hydrogen requirements from 200 to 5,000 Nm³/h at purities up to 99,9999 vol.-% and typical product pressures from 10 bar to 30 bar(abs).

The hydrogen generation plant based on methanol reforming with subsequent purification is a well-established process for hydrogen production and the alternative method at locations with limited access to hydrocarbons.

Basic process steps:
Methanol water mixture is vaporized and converted to hydrogen rich synthesis gas in the tubular thermal-oil heated reactor over copper catalyst. Synthesis gas from reactor outlet is cooled down, condensate is recycled and the hydrogen rich gas is purified using HYDROSWING PSA technology.

With the use of thermal oil the hydrogen production plant will keep its operating temperature extremely stable and can be restarted at short notice e.g. if a power failure occurs. With Mahlers’ technology and design an overheating of the reactor and the low temperature catalyst, which is highly temperature sensitive is prevented by using a heat transfer media (thermal oil) buffering any temperature peaks. This helps to protect the catalyst for the complete lifetime.

Features of the HYDROFORM-M hydrogen plant

- Design for long lifetime
- High operational reliability
- High quality and high safety standard
- First class sub-suppliers for equipment and components
- Fully automatic operation and remote control
- Prefabrication in skids/modules
- Easy maintenance and accessibility

<table>
<thead>
<tr>
<th>Pdata</th>
<th>Methanol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feedstock</td>
<td>200 to 5,000 Nm³/h</td>
</tr>
<tr>
<td>Hydrogen capacity</td>
<td>10–30 bar(abs)</td>
</tr>
<tr>
<td>Hydrogen purity</td>
<td>up to 99,9999 vol.-%</td>
</tr>
</tbody>
</table>

**Typical consumption data for 1,000 Nm³/h hydrogen:**

- Methanol: 630 Nm³/h
- Demineralized water: 340 kg/h
- Cooling water: 20 m³/h
- Electric power: 45 kW

Additional/Optional features for hydrogen production units

Individual plant concepts with respect to product compression, turn-key delivery, water treatment, hydrogen product storage etc. can be offered.