SEPURAN® Noble
Membrane technology for efficient hydrogen generation
EVONIK, THE CREATIVE INDUSTRIAL GROUP FROM GERMANY, IS ONE OF THE WORLD LEADERS IN SPECIALTY CHEMICALS, OPERATING IN THE NUTRITION & CARE, RESOURCE EFFICIENCY AND PERFORMANCE MATERIALS SEGMENTS.

The Resource Efficiency segment supplies high performance materials such as high performance polymers for environmentally friendly and energy-efficient system solutions; we ensure sustainability – in business and everyday life.

SEPURAN® stands for customized hollow fiber membranes for efficient gas separation. The SEPURAN® Noble membrane has been especially developed for hydrogen recovery and purification enabling highly pure hydrogen to be efficiently produced even when inlet concentrations of hydrogen are very low.

Evonik. Power to create.
## HYDROGEN GENERATION

**Our Products**

<table>
<thead>
<tr>
<th>SEPURAN® Noble</th>
<th>4” Cartridge</th>
<th>6” Cartridge</th>
<th>8” Cartridge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stainless steel housings</td>
<td>S5316</td>
<td>S5316</td>
<td>S5316</td>
</tr>
<tr>
<td>Trans membrane pressure</td>
<td>40 bar / 580 psi</td>
<td>25 bar / 362 psi</td>
<td>80 bar / 1160 psi • 70 bar / 1015 psi</td>
</tr>
<tr>
<td>Temperature</td>
<td>&lt; 70 °C / 158 °F</td>
<td>&lt; 70 °C / 158 °F</td>
<td>&lt; 50 °C / 122 °F • &lt; 70 °C / 158 °F</td>
</tr>
</tbody>
</table>

**Recovery advantages**
- Hydrogen recovery of more than 90 percent possible

**Upgrading advantages**
- High selectivity
- Low energy consumption

**Overall features**
- Low space requirements
- Continuous separation process
- Simple modular setup
- Flexible and easily expanded
- No other auxiliary materials, such as water and sorbents, required
- No emissions into the environment
How do the membranes work?

Gas separation membranes work on the principle of selective permeation through a membrane surface. The driving force for permeation of the gas through the membrane is the difference between the partial pressures of the gas on the retentate side and the permeate side.

The greater this difference, the higher the proportion of the gas that permeates through the membrane. In a separation, such as between hydrogen and nitrogen, permeation of carbon dioxide through the membrane is much faster while nitrogen is retained within. The driving force required for the separation is obtained through a partial pressure gradient. The permeation rate of each gas depends on its solubility in the membrane material and on the diffusion rate.

Gases that have higher solubility and smaller molecular size permeate the membrane faster than larger, less soluble gases. The ratio of the transport speeds of two gases is called selectivity.

*The higher the selectivity, the higher the energy efficiency of the resulting membrane process.*

Different membrane materials have different separation properties.
This information and all technical and other advice are based on Evonik’s present knowledge and experience. However, Evonik assumes no liability for such information or advice, including the extent to which such information or advice may relate to third party intellectual property rights. Evonik reserves the right to make any changes to information or advice at any time, without prior or subsequent notice.

EVONIK DISCLAIMS ALL REPRESENTATIONS AND WARRANTIES, WHETHER EXPRESS OR IMPLIED, AND SHALL HAVE NO LIABILITY FOR, MERCHANTABILITY OF THE PRODUCT OR ITS FITNESS FOR A PARTICULAR PURPOSE (EVEN IF EVONIK IS AWARE OF SUCH PURPOSE), OR OTHERWISE. EVONIK SHALL NOT BE RESPONSIBLE FOR CONSEQUENTIAL, INDIRECT OR INCIDENTAL DAMAGES (INCLUDING LOSS OF PROFITS) OF ANY KIND.

It is the customer’s sole responsibility to arrange for inspection and testing of all products by qualified experts. Reference to trade names used by other companies is neither a recommendation nor an endorsement of the corresponding product, and does not imply that similar products could not be used.

* = registered trademark