


The background of the entire page is a soft-focus image of numerous spheres. Some are a vibrant blue, while others are a warm gold or tan color. They are scattered across the frame, creating a sense of depth and movement. The lighting is diffused, giving the spheres a gentle glow.

SEPURAN[®] Noble

Membrane technology for
efficient hydrogen recovery



**EVONIK IS ONE OF THE
WORLD LEADERS IN SPECIALTY
CHEMICALS.**

**THE COMPANY GOES FAR
BEYOND CHEMISTRY TO CREATE
INNOVATIVE, PROFITABLE AND
SUSTAINABLE SOLUTIONS FOR
CUSTOMERS.**

**As the innovation leader in
membrane-based separation
technology Evonik is the world's only
backward-integrated manufacturer of
highly selective separation
membranes.**

**SEPURAN® stands for customized
hollow fibre 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.**

**SEPURAN® NOBLE
VALUE CHAIN**

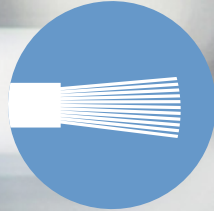


**EVONIK
BUSINESS**

Monomer



Polymer



Membrane



**Module/
Cartridge System**



**EVONIK
TECHNOLOGY
SUPPORT**

**OEM
Partner**

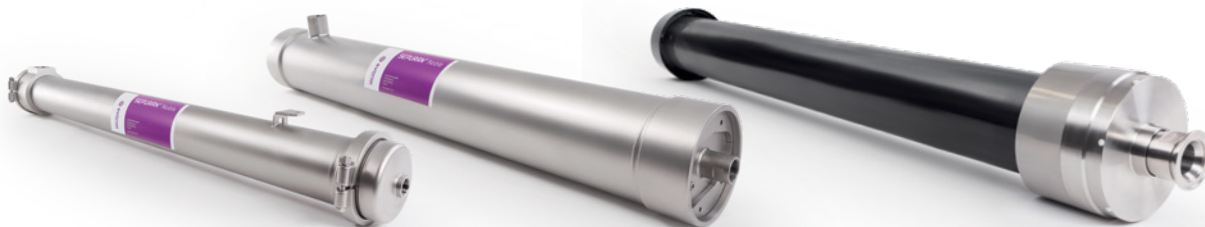


APPLICATIONS

**Onshore applications
with dedicated partners**

HYDROGEN RECOVERY

Our Products



SEPURAN® Noble	4" Cartridge	6" Cartridge	8" Cartridge
Stainless steel housings	SS316	SS316	SS316
Trans membrane pressure	40 bara / 580 psia	25 bara / 362 psia	80 bara / 1160 psia • 70 bara / 1015 psia
Temperature	< 70 °C / 158 °F	< 70 °C / 158 °F	< 50 °C / 122 °F • < 70 °C / 158 °F

Recovery advantages

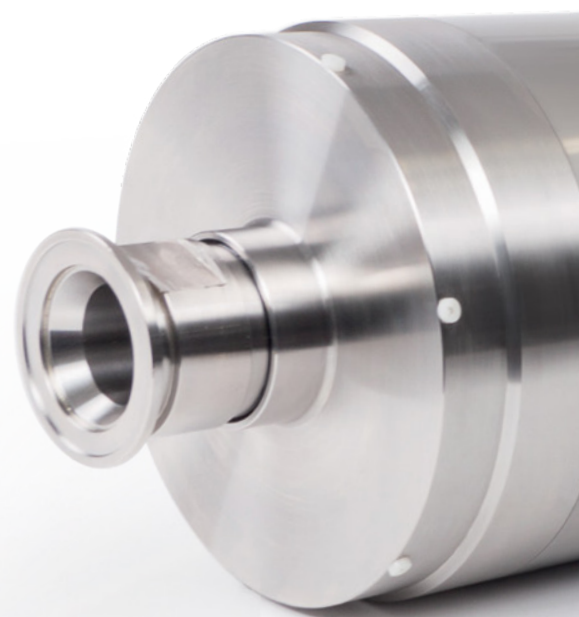
- Hydrogen recovery of more than 90 percent possible

Upgrading advantages

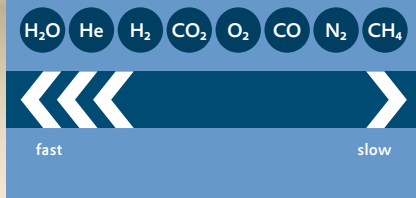
- High selectivity
- Low energy consumption

Overall features

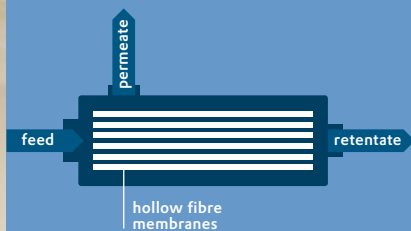
- Low space requirements
- Continuous separation process
- Simple modular setup
- Flexible and easily expanded
- No other auxiliary materials, such as water and sorbents, required
- No emissions into the environment



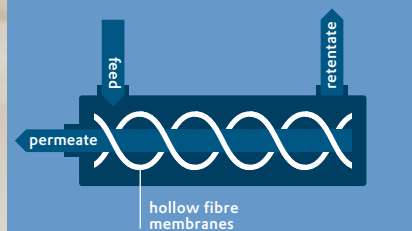
RELATIVE PERMEATION RATES OF VARIOUS GASES



MODE OF OPERATION OF A BORE SIDE MEMBRANE FOR GAS SEPARATION



MODE OF OPERATION OF A SHELL SIDE MEMBRANE FOR GAS SEPARATION



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.

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° = registered trademark

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