

The image shows a complex industrial gas upgrading system. On the left, there are large, white, rectangular storage tanks or components. On the right, there is a dense network of pipes, valves, and a pressure gauge. A large purple rectangular overlay covers the bottom half of the image, containing the main title and subtitle in white text.

HY.PURE GAS UPGRADING SYSTEM

IMPROVING GAS QUALITY TO SPECIFICATIONS

PURIFICATION OF HYDROGEN

HyGear offers a product line of gas purification systems to purify hydrogen that is used in the process. The Hy.PURE can be installed in various industries like the flat glass manufacturing and metal production.

The Hy.PURE systems are designed from a perspective of being able to clean up hydrogen-containing gases to high purity hydrogen by using pressure swing adsorption technology. Different gas streams can be purified by either upgrading hydrogen-containing mixtures by removing undesired gaseous impurities or by purifying industrial grade hydrogen.

This product line consists of three different models; Hy.PURE 10 which is skid-mounted, whereas the Hy.PURE 100 and Hy.PURE 250 are containerised systems.

Applications

- Flat glass industry
- Metal industry
- Electronics industry
- Food industry
- Chemical industry
- Hydrogen filling station



KEY BENEFITS

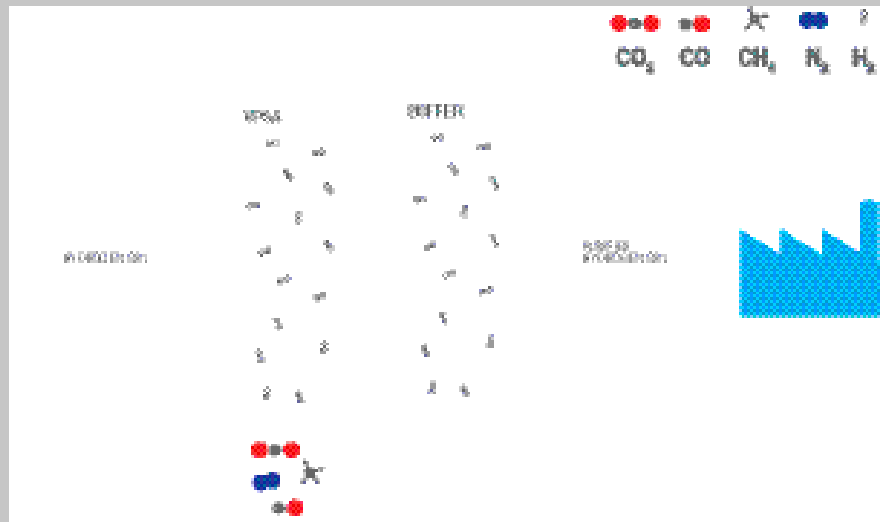
- Improved product quality
- Reduced environmental impact
- Low electricity consumption
- High flexibility
- Integration with gas mixing station
- Autonomous and safe operation

TECHNOLOGY

The ingoing gas stream is fed into the VPSA from feedstocks that can either be from tube trailers, bottle racks or used process gas.

The hydrogen is then separated in the VPSA from other gaseous species under (slightly) elevated pressure using the differences in the adsorption properties.

By using an optimum number of vessels and HyGear's proprietary vacuum technology, the gas is cleaned in the most efficient way possible. The cleaned hydrogen is then fed into the end-user's process stream.



Technology

The Hy.PURE system not only pre-treats the hydrogen from the current gas stream by further removing impurities but also post-treats the hydrogen from gas mixtures where it is recovered, cleaned and fed back into the process.

The complexity is that most mixed atmospheres are extracted from the process at lower pressure while gas purification usually requires a larger pressure differential. HyGear's proprietary vacuum pressure swing adsorption (VPSA) technology minimises the need for compression.

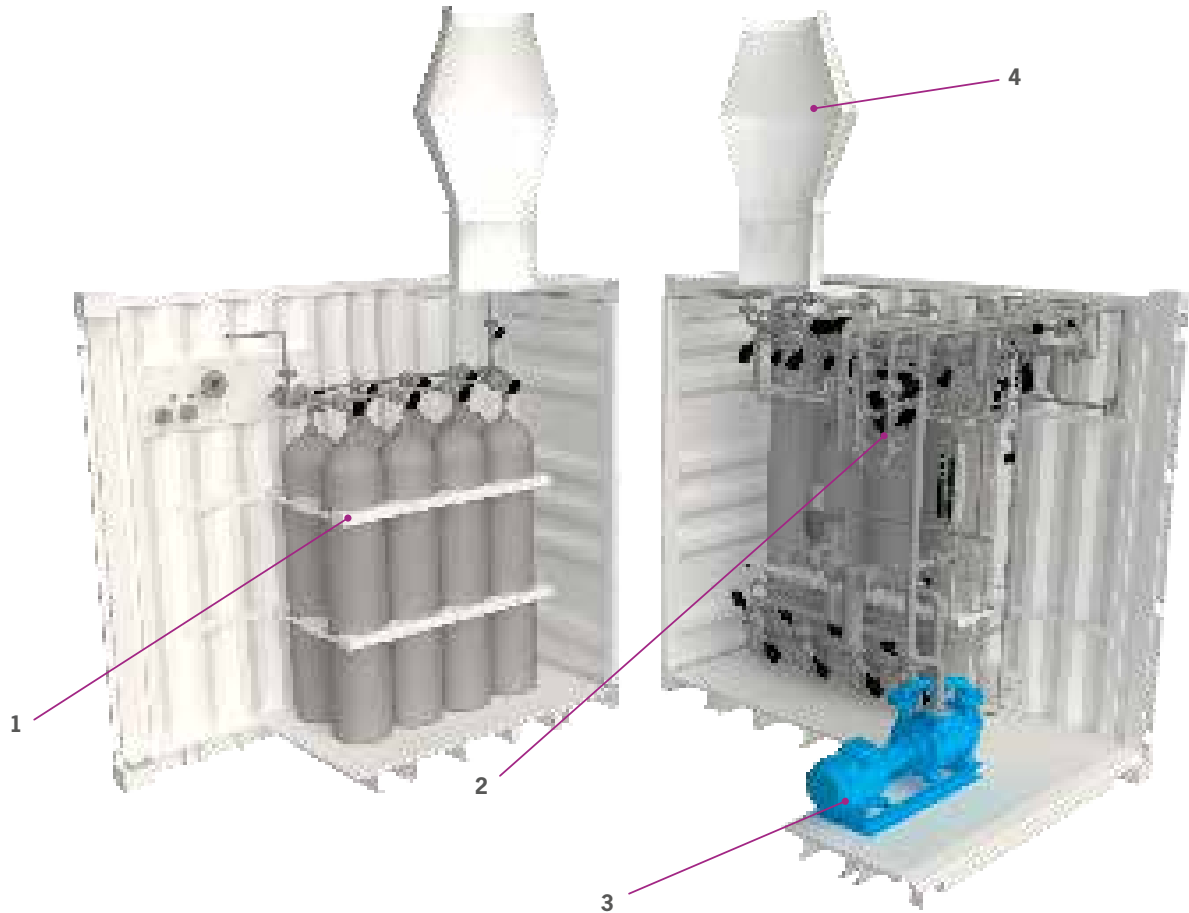
Low pressure VPSA technology

By applying vacuum, the pre-pressure can be kept at a minimum, which results in the overall reduction of electricity consumption.

Efficiency optimisation by integrated gas polishing

The VPSA technology is flexible towards the hydrogen purity, and levels up to 6.0 (99.9999%) purity can be reached. To overcome yield decreases for higher purities up to 8.0 (99.999999%), an integrated catalytic polishing system can be included.

WHAT'S INSIDE



1. Buffer vessels

2. PSA

3. Vacuum pump

4. Ventilation fans

SPECIFICATIONS

MODEL	Hy.PURE 100	Hy.PURE 250
INPUT		
Flow	10 -100 Nm ³ /h	100 - 250 Nm ³ /h
Temperature	< 40°C	< 40°C
Pressure	8.0 bar(g)	8.0 bar(g)
OUTPUT		
Yield ^{1, 2}	up to 90%	up to 90%
Purity	up to 8.0	up to 8.0
Pressure	0 - 7.0 bar(g)	0 - 7.0 bar(g)
Temperature	ambient	ambient
Dewpoint	< -76°C	< -76°C
CONSUMPTION		
Instrument air	1.5 Nm ³ /h	3 Nm ³ /h
Electricity ^{2,3}	13 kWe	17 kWe
DIMENSIONS		
Size	10 ft	20 ft
Weight	3,750 kg	11,000 kg

¹Based on inlet gas composition.

²With vacuum pump.

³ Pending availability of cooling water.

⁴ Pending ATEX zone placement.

All data and values are indicative and based on nominal and non-frost conditions.

Values might differ due to local circumstances and feedstock characteristics.

Normal conditions (Nm³) is defined at temperature of 0°C and pressure of 1.013 bar(a).

**IF YOU REQUIRE OTHER SPECIFICATIONS, CONTACT US
TO ASSIST YOU WITH THE MOST OPTIMAL SOLUTION.**

CONTACT US

Netherlands

FIND US

Westervoortsedijk 73 HG
6827 AV Arnhem

MAIL US

P.O. Box 5280
6802 EG Arnhem

CONTACT US

+31 88 9494 300
info@hygear.com
www.hygear.com

SALES

+31 88 9494 308
sales@hygear.com

www.hygear.com

 **HYGEAR**