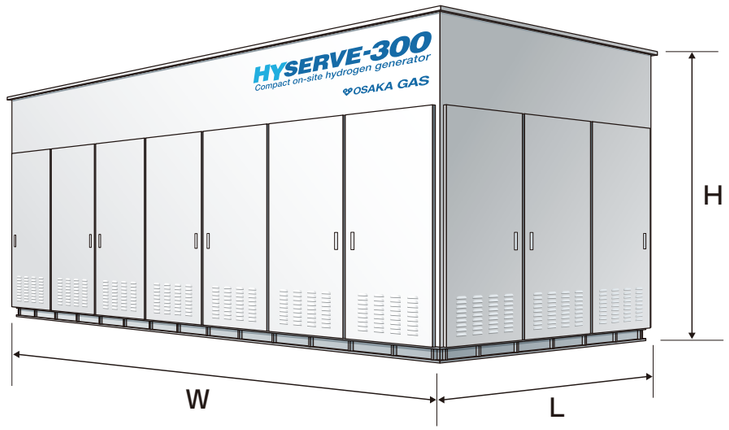
Equipment specifications

◆Specifications

Model	HYSERVE-30	HYSERVE-100	HYSERVE-300
Raw material	Natural gas, Propane gas		
H_2 production capacity	30m^3*N*/h	100m^3*N*/h	300m^3*N*/h
H_2 purity	≧ 99.999vol%		
H_2 supply pressure	≦ 0.70MPaG		
Operation	Automatic program Load management (40-100%),Hot standby operation		
Minimum Unit Size*	3,600W×2,000L×2,950H	5,300W×2,750L×3,450H	9,700W×3,000L×3,550H
Options	Remote monitoring,etc.		

*Except for utility area (compressor,water purification,cooling tower,control panel etc.)
It may be extended about width and Length for Maintenance space,etc.

◆Outline dimension



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OSAKA GAS LIQUID Co., Ltd.
Daigas G&P Solution
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2020.10-2G (RAY) 500

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Super Compact On-site Hydrogen Production Unit

Super compact design + Low cost

HYSERVE® Series

OSAKA GAS LIQUID Co., Ltd.
Daigas G&P Solution
OSAKA GAS

At Minimum Space & Low Cost

High-Purity Hydrogen Production Unit

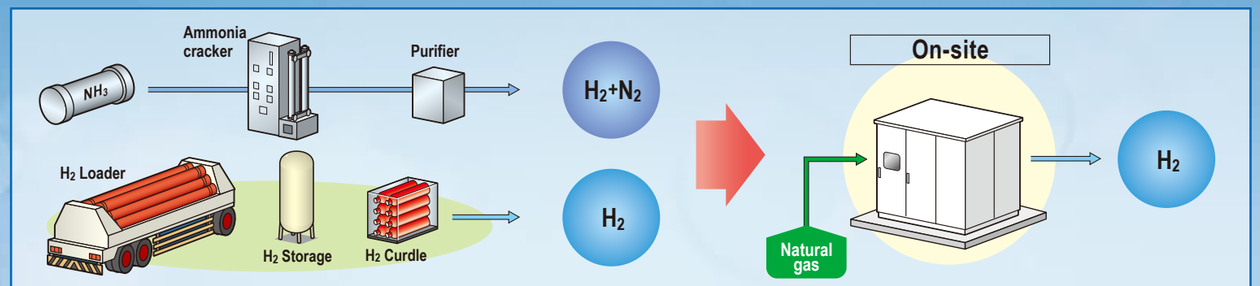
HYSERVE-30 **HYSERVE-100** **HYSERVE-300**

HYSERVE-300

Features

Compact design suitable for on-site hydrogen supply

- Compact medium pressure (＜1.0MPa) reformer and compact PSA using improved operation system are designed with less thermal and pressure losses.
- A package of the reformer and the PSA makes it possible to shorten the installation period and to reduce the construction cost at a customer site.
- High-purity hydrogen is produced easily at the customer site using natural gas supplied through pipeline.



High-purity hydrogen

- High-purity hydrogen (≧99.999%) is produced from natural gas.

Dramatic cost reduction

- Natural gas supplied at medium pressure is available to reduce compression power significantly.
- Effective use of PSA off-gas, depending on the operation condition, can reduce natural gas consumption rate.
- 1 skid mount packaged structure can reduce installation time and cost at a customer site.

An example of HYSERVE-30 installed at a customer's site (2 units)

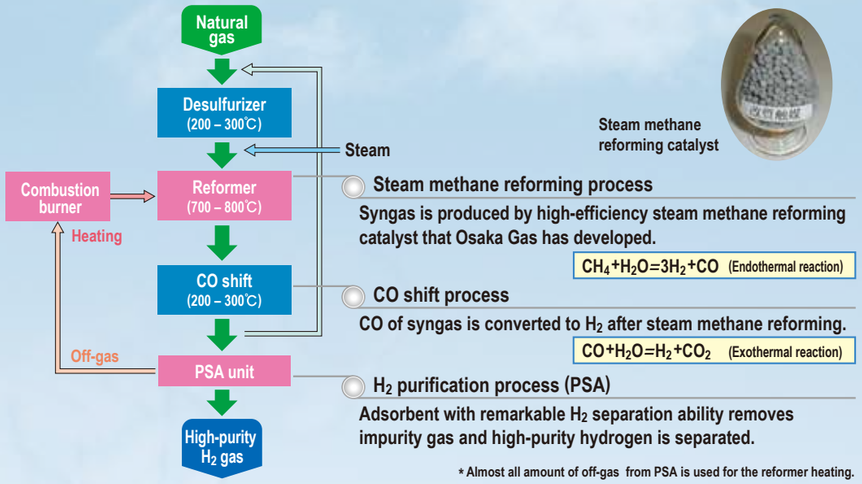
Easy operation

- Automatic operation by one button start and stop.
- Load between 40 to 100% and hot standby operation are available.
- High-purity hydrogen is produced within 30 minutes from the mode of hot standby.

Many options

- Remote monitoring system, remote operating system, etc., are optional.
- Capable Countermeasure of TIIS(Japanese regulation)(IECEx in preparation)

Steam methane reforming system



Steam methane reforming catalyst

Steam methane reforming process

Syngas is produced by high-efficiency steam methane reforming catalyst that Osaka Gas has developed.

$CH_4+H_2O=3H_2+CO$ (Endothermal reaction)

CO shift process

CO of syngas is converted to H_2 after steam methane reforming.

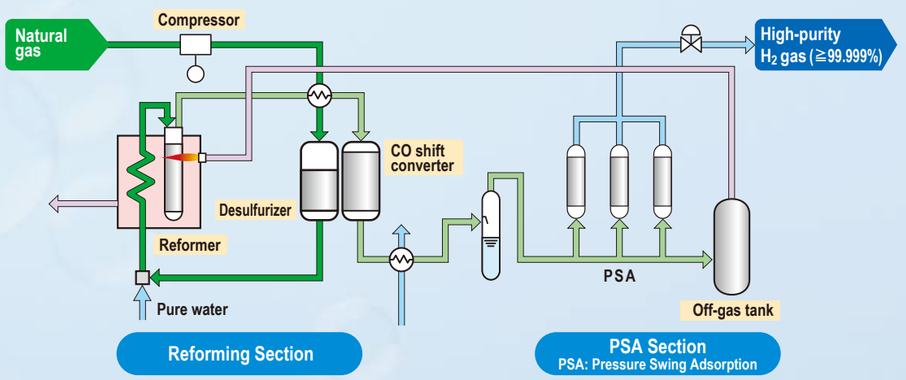
$CO+H_2O=H_2+CO_2$ (Exothermal reaction)

H_2 purification process (PSA)

Adsorbent with remarkable H_2 separation ability removes impurity gas and high-purity hydrogen is separated.

* Almost all amount of off-gas from PSA is used for the reformer heating.

Process flow



Major application

Hyserve unit can easily supply hydrogen at low cost using minimum space eliminating the need for a high-pressure hydrogen tube trailer or ammonia cracker. High-purity hydrogen can be used for various industrial applications.

Metal Industry

Metal ceramic
Metal heat treatment
·Stainless bright annealing
·Galvanized steel reducing treatment
·Various baking furnace protective gas
Magnetic iron powder
Metal sintering etc.

Glass & Ceramic Industry

Plate glass manufacturing
Quartz glass manufacturing
Quartz glass processing
Fiber optics
Ceramic package
etc.

Electronics, Chemistry, Food Industry, etc.

Semiconductor
Silicon wafer
Petroleum resin hydride
Chemicals
Catalyst manufacturing
Fat and oil etc.