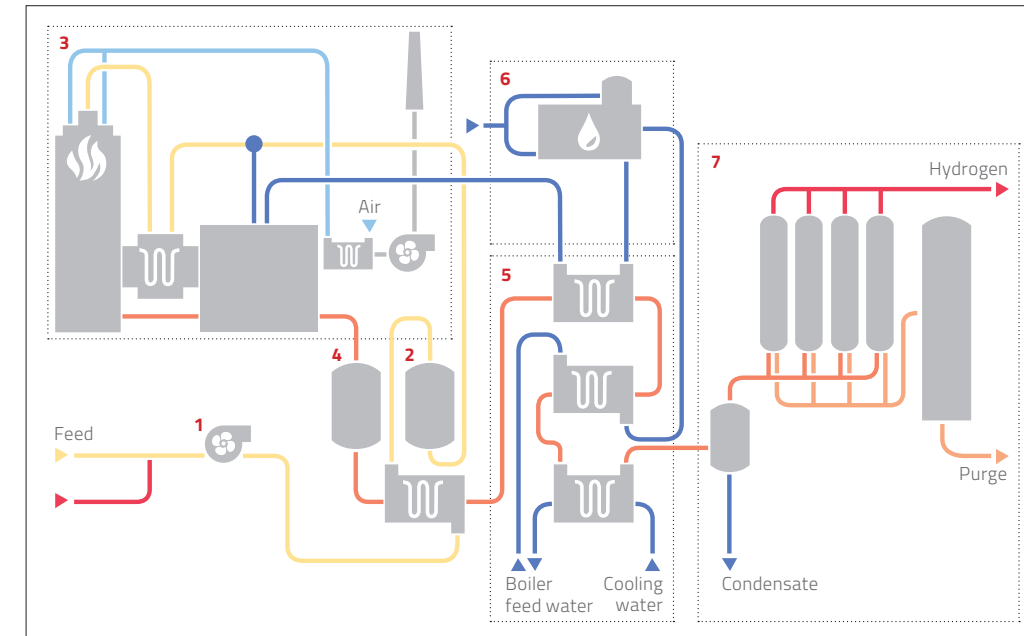


HYDROFORM-C

The hydrogen generator



1 Feed compression unit 2 Feed pretreatment 3 Reforming and steam generation 4 High temperature CO-conversion
5 Heat exchanger unit 6 Pretreatment of boiler feed water 7 Purification unit – HYDROSWING system

The basic process

Steam reforming of natural gas, LPG or naphtha (feedstocks) with subsequent purification is the most economic and thus most common process for hydrogen production and serves 95% of the world's hydrogen demand.

Pretreatment of the feed

The feed is mixed with a small amount of hydrogen, is pretreated (e.g. compressed, warmed-up) and sent to the desulphurization reactor. After desulphurization the feed is mixed with process steam generated in the steam boiler.

Steam generation and reforming

Steam is generated in the optimized waste-heat-recovery unit which includes mainly combustion air preheating, feed superheater, fluegas boiler and process gas cooler. The feed/steam-mixture is reformed within the top-fired reformer furnace into raw hydrogen-rich gas. The required heat is generated by means of combustion of fuel gas and purge gas coming from the HYDROSWING system.

High temperature CO conversion

The process gas is fed to the HT-CO conversion reactor to obtain additional hydrogen according to the water-gas shift reaction.

Gas cooling and heat recovery

After CO-conversion the converted gas is cooled down in a series of heat exchangers by simultaneous economical preheating of process streams. The process condensate is separated and can be reused.

Purification system – HYDROSWING

The hydrogen-rich gas is sent to the HYDROSWING system which usually consists of four or five adsorbers filled with different adsorbents. The purification process is based on pressure swing adsorption by which the impurities are separated to obtain high-purity hydrogen with purities up to 99.9999 vol.-%. The purge gas from depressurization and purging during the regeneration step is used as fuel gas in the reforming section.

Applications

Hydrogen is an important utility for numerous applications in multiple industries. Users in a wide range of industries can benefit from operating a cost-effective Mahler AGS hydrogen plant and reduce their production costs significantly.

- Metallurgical and steel industry
- Petrochemical and refining industry
- Glass and float glass manufacturing
- Chemical and pharmaceutical industry
- Production of H₂O₂
- Food industry
- Electronics industry
- Technical gases

PLANT FEATURES

Capacities from 200 to 10,000 Nm³/h

Product pressure between 10 and 30 bar(abs)

Purities up to 99.9999 vol.-%

Design for long lifetime

High operational reliability: Many years of experience in plant design, engineering and manufacturing guarantee a high reliability of the HYDROFORM-C system.

High quality and high safety standard

First class sub-suppliers for equipment and components

Fully automatic operation and remote control:

The system is designed for automatic and unattended operation, e.g. change of capacity. Even automatic start-up, shut-down, control and load adjustment from long distances is possible.

Prefabrication in skids/modules:

The system is pre-assembled and delivered in prefabricated units.

Easy maintenance and accessibility

Additional/Optional features:

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