

Tranter[®] heat exchangers in

GREEN HYDROGEN

production



TRANTER'S COMPACT PLATE HEAT EXCHANGERS ARE USED IN VARIOUS ENERGY INTENSE INDUSTRIAL APPLICATIONS. LET'S TAKE A LOOK AT HOW PLATE HEAT EXCHANGERS CAN BE USED IN THE PRODUCTION OF GREEN HYDROGEN AND IN THE HYDROGEN VALUE CHAIN.

For Green Hydrogen production, Tranter Gasketed plate & frame heat exchangers are applied in various renewable power generation plants, such as centralized solar power plants, hydro power plants and offshore wind farms. The compact footprint of reliable operation of Tranter plate heat exchangers makes them an excellent choice for remote offshore wind installations, read more at [tranter.com](https://www.tranter.com).

In the electrolysis process, Green Hydrogen is produced from renewable power sources and water. Tranter's Gasketed plate & Frame and Shell & Plate heat exchangers can be used in the Proton Exchange Membrane process (PEM) and the Alkaline water electrolysis process (AWE).

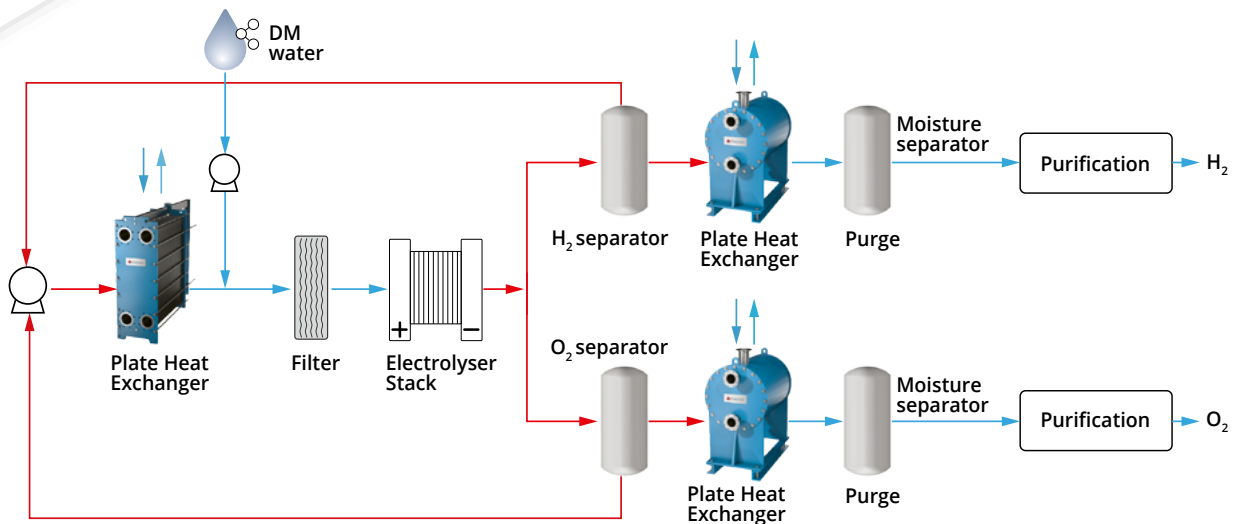
In both processes, a liquid is recirculated over an electrolyser stack to form hydrogen and oxygen, in which heat is released that need to be cooled away, typically in Tranter's compact plate heat exchangers.

The electrolyte is pumped through the electrolyser cell where the gas is produced. Adjacent gas separators split both phases, and the liquid phase flows back to the electrolysis stack. Tranter plate heat exchangers ensure that the optimal temperature is maintained, and that the product gases can be purified afterward.



In the PEM process, the electrolysis works on operating temperatures and pressures ideal for Tranter's gasketed plate & frame heat exchangers. The recirculated process liquid is cooled down using a cooling medium circuit. Tranter's plate heat exchangers can be designed as a

combi coolers to enable a single heat exchanger frame to cool the recirculated process liquids from both the Hydrogen and the Oxygen side, saving space, costs and cooling medium consumption.

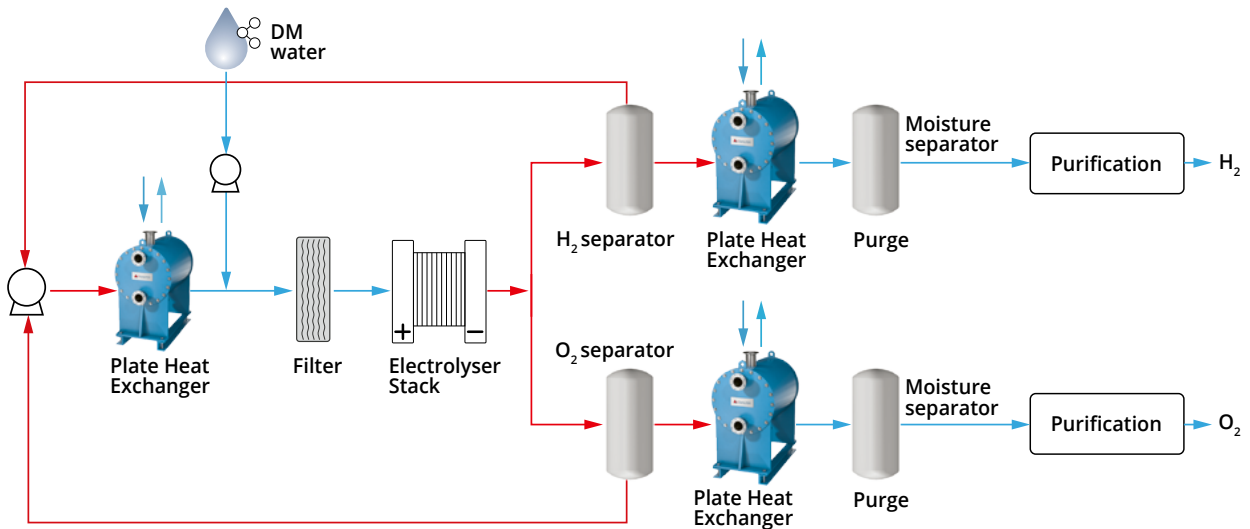


The formed Hydrogen and Oxygen need to be further cooled prior to the purification. Tranter's fully welded Shell & Plate heat exchangers with a short flow path a deep draw depth design is a good fit and provide significant space and weight savings, compared to traditional

Shell & tube heat exchangers as H2 and O2 coolers. The efficiency of plate heat exchanger enables more water to be separated by means of condensation, reducing the required size and cost of the drying section of the plant.

In the Alkaline water electrolysis process (AWE), the recirculated electrolyte is alkaline water, typically a 30-40% potassium hydroxide (KOH) solution. Tranter's plate heat exchangers can be constructed in Nickel alloys, capable of handling the alkaline solutions.

The high operating pressure needed in the Alkaline process, >30 bar, makes Tranter Shell & Plate heat exchanger a compact, reliable and gasket-free heat exchanger solution for the Electrolyte cooler.



A closed loop of Cooling medium, normally water or water/glycol mixture is used for all the different coolers in the Green hydrogen production process. The closed loop Cooling medium is in turn cooled in a central cooling system, using water from a nearby sea, lake or river, or from a cooling tower in case of absence of a natural water

reservoir. As a rule of thumb, approximately 25-30% of the electrolyser plant's total capacity need to be cooled in the central cooling system, where Tranter's Plate & Frame heat exchangers are optimal for large cooling medium cooler duties, capable of handling close temperature approaches and large volumes.

For the conversion of renewable energy to green fuels or chemicals such as Green Hydrogen, Syngas, e-methanol and e-ammonia, referred to as Power-to-X (P2X), Tranter's gasketed and welded plate heat exchangers can be applied in various applications in your plant to help make the industry more sustainable. Tranter's gasketed plate & frame heat exchangers provides a compact footprint with excellent thermal efficiency and serviceability that can be applied for heat recovery duties, utilities and process heating/cooling.

Tranter's welded product range, the NovusBloc and Shell & plate heat exchangers, can be applied in highly demanding liquid and gas applications. The gasket-free design can handle high temperature /pressure and difficult fluids without sacrificing plot space.



AT THE FOREFRONT OF HEAT EXCHANGER TECHNOLOGY FOR MORE THAN 90 YEARS

Tranter is an American based global manufacturer of gasketed and welded plate heat exchangers and a full-service aftermarket provider for the plate heat exchanger industry. Significant manufacturing, research, design engineering and product development activities are based in the USA, Brazil, Sweden, China, India and Korea and enable responsiveness to local demands. Tranter is represented globally by a network of our own sales companies, licensees and agents.



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