

Press release

RTS Africa fills a gap in the local hydrogen generation market with Nel Hydrogen Proton Exchange Membrane (PEM) electrolyzers

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With its wide range of industrial uses and applications, hydrogen is a very important molecule. This gas is essential in many sectors such as chemicals, refining, metallurgical applications; as well as glass and electronics manufacturing to name a few.

When it comes to the bulk manufacturing of hydrogen, there are adequate, cost-effective solutions for generating high-volume hydrogen locally available.

“However, for the supply and storage of hydrogen, small-to-medium users have relied, for the most part, on gas in cylinders - as a convenient and consistent means of generating high-purity hydrogen at smaller volumes on site has previously not been readily available,” says Ian Fraser, Managing Director of RTS Africa Engineering.

RTS Africa, in collaboration with its long-term principal Nel Hydrogen, has been a leader in the supply of many of South Africa's hydrogen electrolyser technology solutions for the past two decades.

Based in Norway, their principal Nel is a world leader in the supply of conventional alkaline-based hydrogen electrolysis systems.

“In 2017, Nel bought the US-based company Proton OnSite, the largest manufacturer of on-site hydrogen generators, which offers its advanced Proton Exchange Membrane (PEM) electrolysis technology to various markets focusing on small to medium-sized plants,” Fraser advises.

He adds that the acquisition of Proton OnSite fully complements Nel - both in terms of technology and market outreach - providing a strong strategic fit for both companies. Fraser recently spent time with the company in the US, in order to become fully conversant with its PEM technology and electrolyser solutions.

"A constraint with conventional alkaline electrolyzers is that they only become economical when producing larger volumes of hydrogen - in excess of some 60 to 100 normal cubic metres. It is possible to make smaller alkaline electrolyzers but, at that scale, they are not economical," he explains.

However, as PEM electrolyzers employ a different technology to produce hydrogen, these units can be far more compact. For example, many small PEM electrolyzers can be found serving in laboratories in the form of a bench-top supply of small-scale on-site hydrogen.

"Typically, these units would be supplying quantities of a couple of cubic centimetres," Fraser points out, adding that PEM technology can also be used for much higher capacity electrolyzers.

PEM electrolysis technology is both ingenious and simple. At the core of a PEM electrolyzer is a proton exchange membrane. The conventional alkaline electrolysis process uses electricity to split water into hydrogen and oxygen. In a PEM electrolyzer, however, water reacts at the anode to form oxygen and positively-charged hydrogen ions (protons). The electrons flow through an external circuit and the hydrogen ions selectively move across the PEM to the cathode. At the cathode, hydrogen ions combine with electrons from the external circuit to form hydrogen gas.

While the origins of PEM electrolysis technology can be traced back to the 1950s, the company Proton OnSite was founded in 1996. Among other achievements, the company was instrumental in the development of PEM electrolyzers for use in nuclear submarines, where a reliable, risk-free supply of clean, consistent-quality hydrogen was essential.

Fraser points out that PEM electrolyzers - when using 'clean' energy - are completely environmentally-friendly, as they use only electricity and demineralised water in the process. "The fact that it is possible to have a smaller volume electrolyzer, which does not need an alkaline electrolyte is in certain instances also an advantage, he explains.

Asked what the possible industry applications are for a Nel Proton® PEM Electrolyzer, Fraser elaborates that they are numerous. "They have application in the chemical industry: for example, in plants making furfural alcohol or hydrogen peroxide to name just two products. They are also be used to supply hydrogen to power stations and annealing plants."

The smaller units also have wide application in research institutions and universities where laboratories might need a reliable on-demand supply of ultra-high-purity hydrogen.

"At RTS Africa, we are very excited to partner with our principal Nel Hydrogen in marketing this versatile new product to southern African industry.

Nel Proton® PEM Electrolyzers make a valuable contribution to the range of electrolyzer options available to our clients, and very innovatively fill what has long been a gap in the local hydrogen generation market," concludes Fraser.

Ends

(720 words)

Note to Editors

RTS Africa Engineering is a specialised, Tshwane-based company offering innovative technologies for - and solutions to - industrial challenges.

Run by Managing Director Ian Fraser since its inception in the early 1990's, the company offers globally-sourced, quality products such as inertial spin filters, laser-based gas detection devices for hot or corrosive areas, and electrolyzers for hydrogen production.

Product delivery and technical consultation by highly-trained staff is offered throughout Southern Africa to a range of clients in industry sectors such as mining, glass, steel and energy.

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