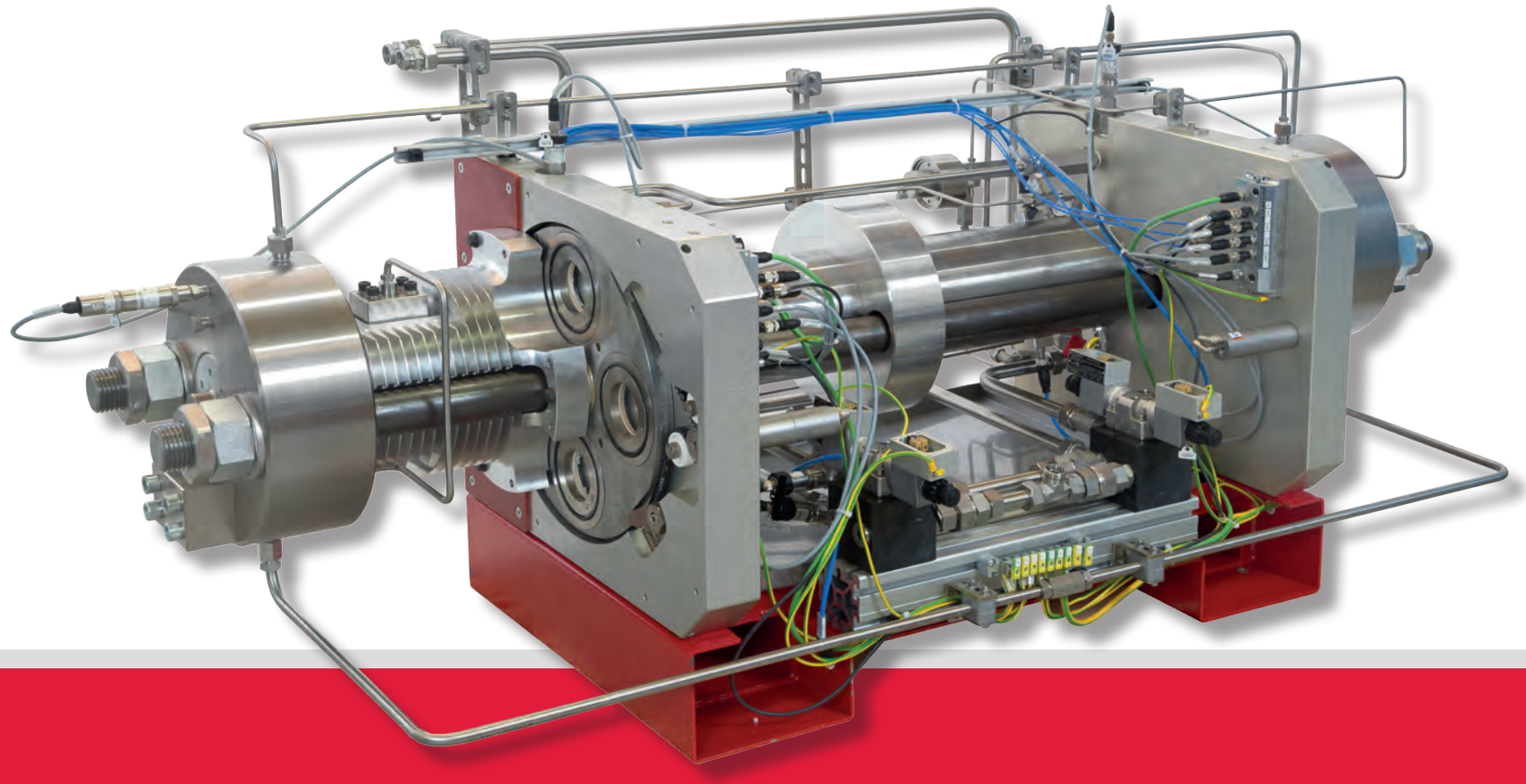
MAXIMATOR®

Maximum Pressure.

High Pressure Technology • Testing Equipment • Hydraulics • Pneumatics



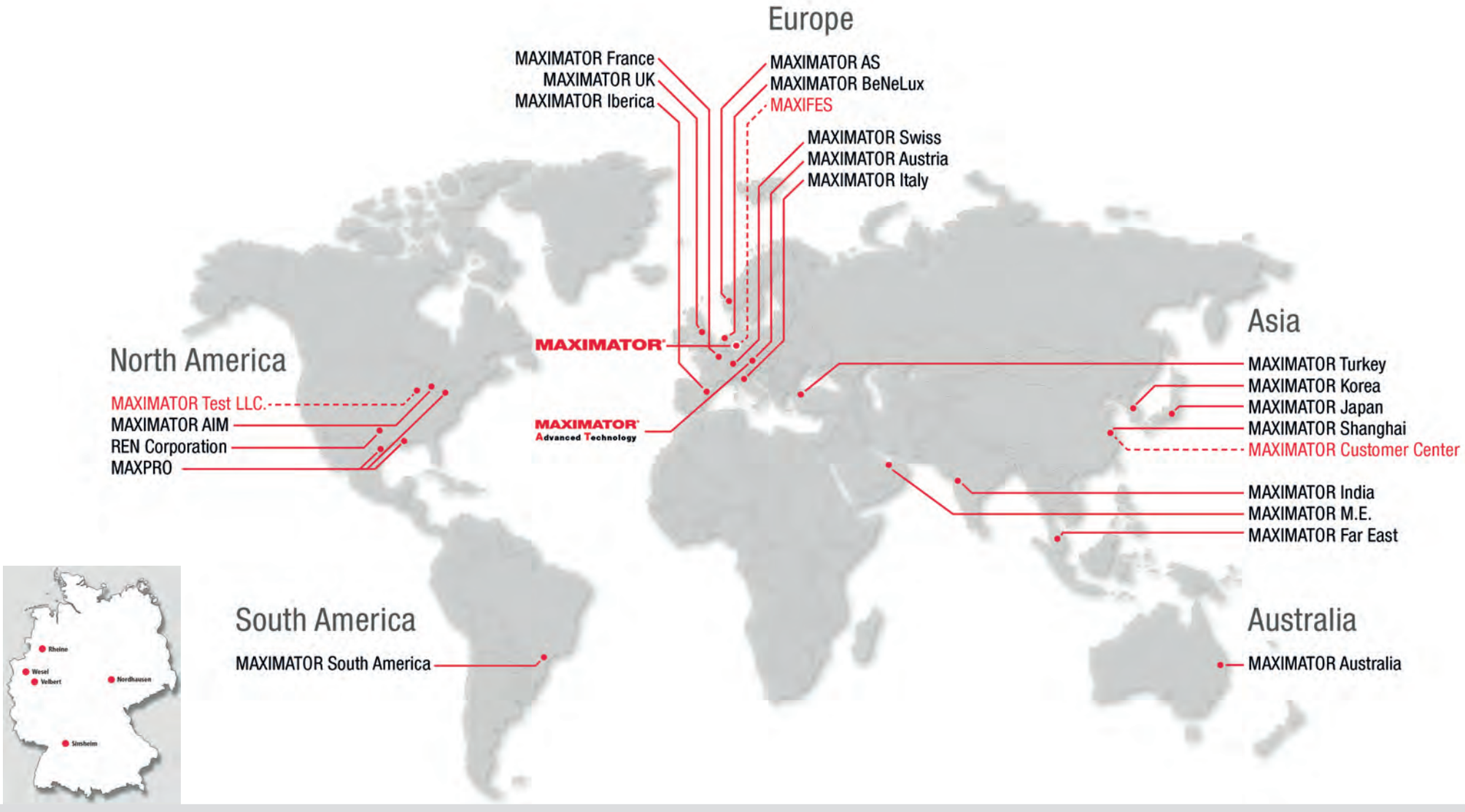
Hydrogen Technology

» **Hydrogen usage through high efficient MAX-Compression**

- About Maximator

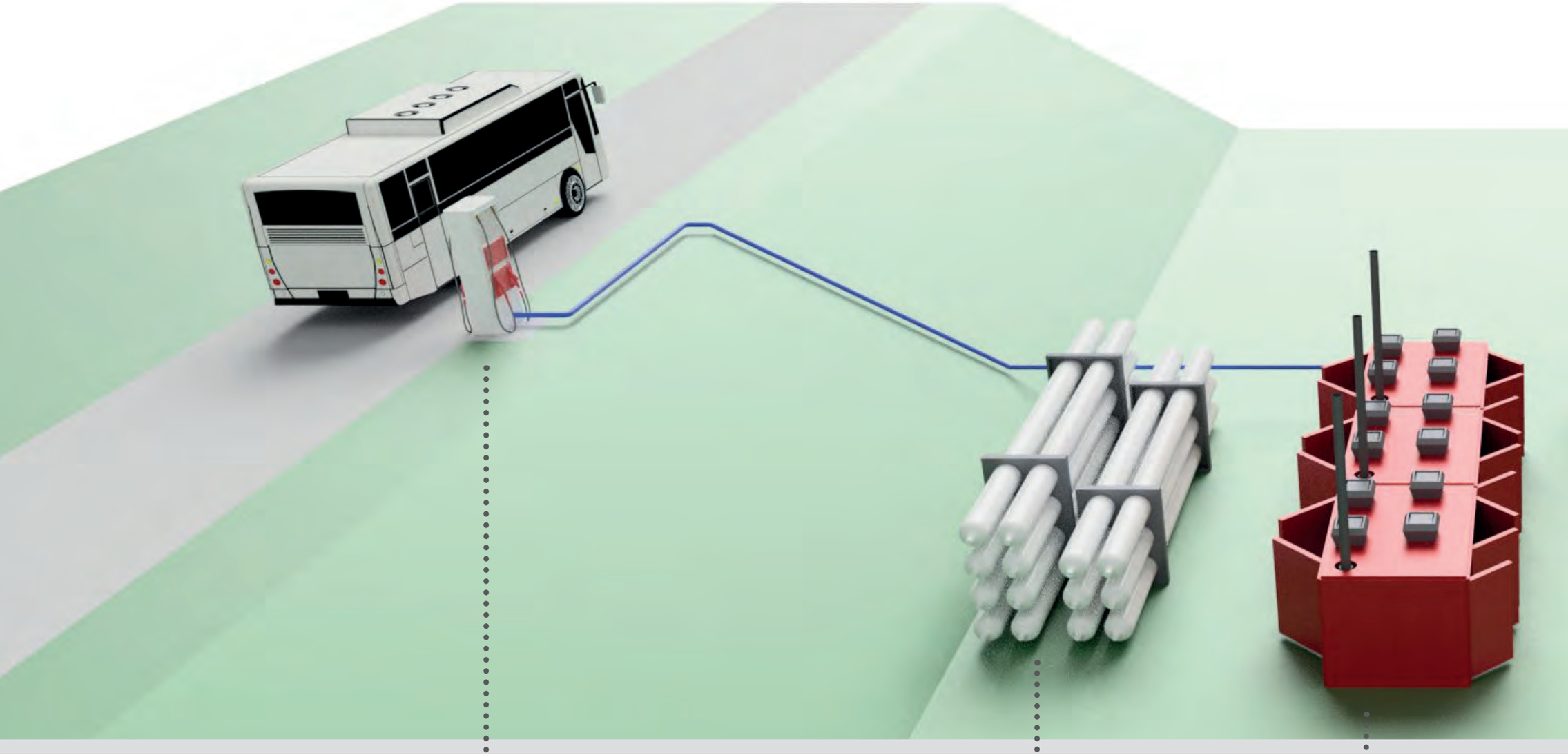
Maximator is one of the leading companies providing high pressure equipment up to 25,000 bar. The standard air driven Maximator Boosters have been used in hydrogen applications for over 20 years. Since 2007 hydrogen applications specifically have been one of Maximator`s main focus areas and recently the company has the funded of the development of the Maximator Advanced Technology (MAT) department. MAT will develop exciting new technologies for hydrogen systems.

Maximator employs 700 employees. Head-quarters is located in Nordhausen, Germany. Our headquarters facility includes Maximator engneering and manufacturing. Our hydrogen equipment will be manufactured at our Nordhausen facility which will ensure the products are built using state of the art technology and quality processes. Maximator also has offices located in Shanghai, China and the United States. These offices will be responsible for commissioning and field service of the hydrogen stations located in these areas. Additionally, as the demand for hydrogen station market increases, Maximator plans the expand station production to these locales.



To address Maximator`s growing hydrogen business, Maximator Gas Solutions, as well as the Joint Venture between Maximator and TestNet GmbH company, have been established. Maximator Gas Solutions as well as the Joint Venture Maximator & TestNet company have been established. Maximator Gas Solutions is focused on developing storage assembly systems and obtaining the necessary regulatory approvals for these systems. The Joint Venture with TestNet is concentrated on life cycle testing for hydrogen storage systems.

Maximator is owned by Schmidt & Kranz Holding. Schmidt & Kranz, founded in 1885, is a privately owned family company specializing various engineering technologies including the development of mining equipment, mineral processing equipment, automated test equipment and tunnel boring equipment. With the recent global emphasis on reduced emissions and carbon footprint, Schmidt & Kranz are focused on developing and deploying hydrogen technology worldwide to support these green initiatives.



» Max-Dispenser

» Max-Storage

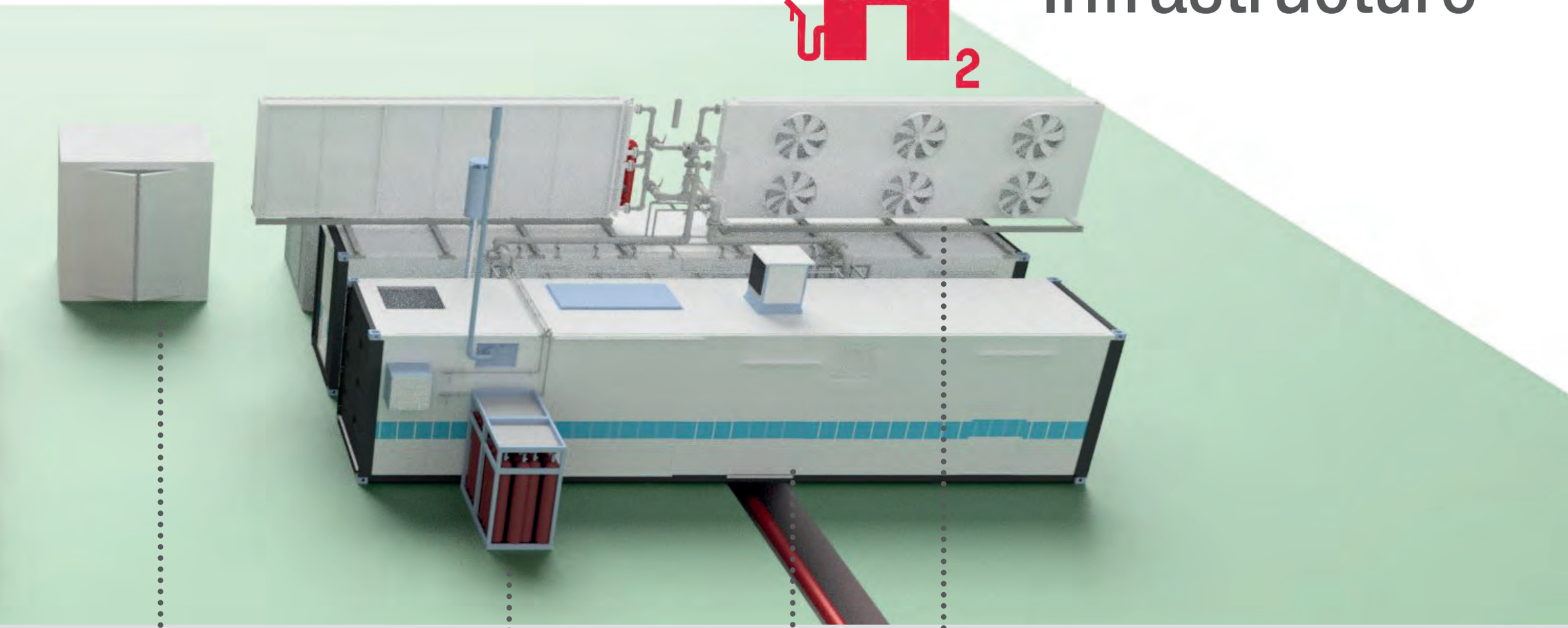
» Max-Flowtech

» Max-Compression

» Max-Power

» Max-Cool

H2 MAX - Infrastructure



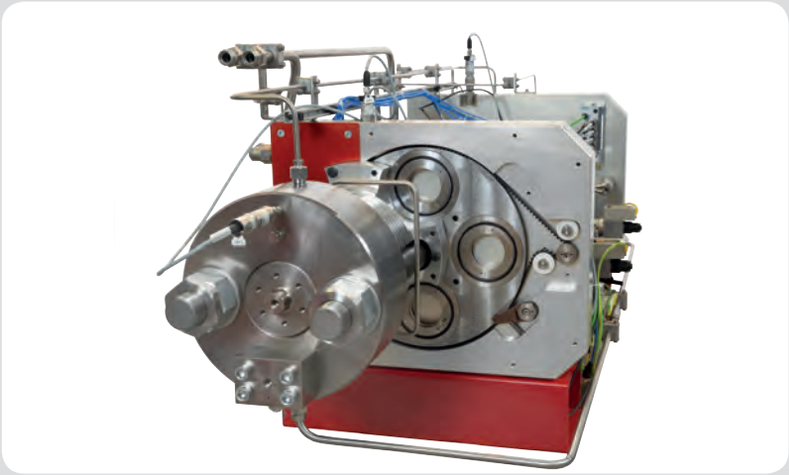
» Transformer station

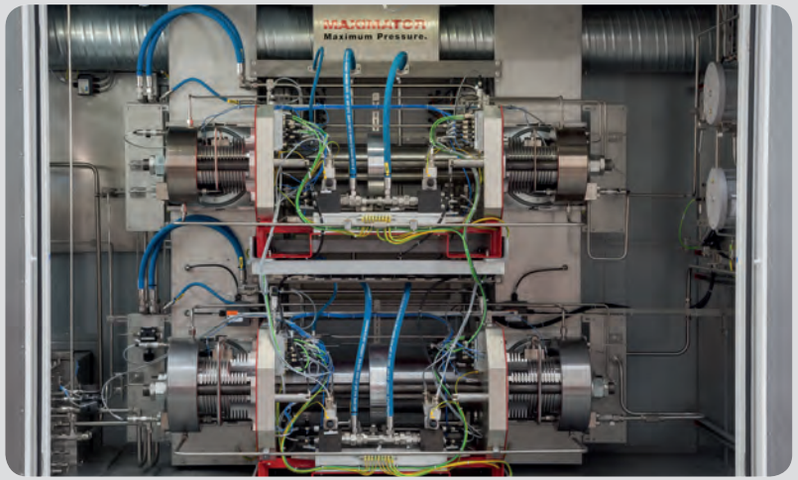
» N_2 bundle

» Electrolysis unit

» Cooler

- Refueling Station





Max-Compression with ASX (one stage)

- ASX - Automatic Seal Exchange within 2 minutes
- Dry running compressor system
- Compression process is safe and contaminant free
- Reducted service and maintenance costs
- High uptime availability

Max-Compression and Max-Power

- Max-Compression with 2 stages for continuous hydrogen compression up to 1,000 bar
- Control free Max-Power unit for generating pneumatic pressure
- Max-Power drives the piston on the low pressure side
- Closed loop system which increases the efficiency up to 95 %

Max-Cool

- Refrigerant system which pre conditions the hydrogen according to SAE J2601 T40 and JPEC-S0003
- System consists of 2 refrigerant circuits connected with a single diffusion bonded heat exchanger
- Designed to cool the plate heat exchanger (evaporator) inline

Max-Storage

- High pressure ground storage system by Maximator Gas Solutions (inclusive valve manifold)
- Separate compartment, attached to the container
- Ground storage (swapped or stationary) separated into 3 banks

- Dealer Value Proposition

The Dealer Value Proposition (DVP) is a comprehensive and holistic service offering designed to help Shell independent retail wholesalers, licensees and selected other third parties, to quickly, safely and cost effectively deploy hydrogen refueling equipment at their existing stations or at new locations.

The DVP enables retailers to leverage Shell's safety expertise, engineering expertise, strategic initiatives, branding and substantial buying power to exploit the growing business opportunity for hydrogen refueling. The DVP offering provides the retailer with Shell's hydrogen expertise and experienced assistance and support during key phases of the Hydrogen Refueling Station (HRS) selection, integration and implementation process. Shell is a leader in developing high performing, reliable and low-cost solutions for hydrogen refueling.

Shell awarded Maximator as one partner for the hydrogen refueling stations worldwide. Maximator is an engineering leader in high-pressure technology and develops core components for hydrogen technology. The partnership between Shell and Maximator provides the customer with a high reliability and state of the art hydrogen refueling station coupled with outstanding service, support and expertise.

MAX H_2 - Maximator Advanced Technologie

The MAT department is focused on thermodynamic solutions for Maximator equipment. MAT`s roadmap is focused on optimizing and enhancing compression technologies, in particular hydrogen compression technologies, by reducing CAPEX related costs through the use of improved materials and more efficient engineering designs lowering OPEX costs by providing highly reliable systems. One current engineering area of focus is the development of a highly efficient and reliable hydrogen compressor, which can compress up to 1000 bar.

The MAT Team includes engineers who are experienced in hydrogen applications and specifically have been involved in hydrogen fueling initiatives since the beginning. The team was involved in the creation of a fueling specification (release version A) which was the basis for the international SAE fueling protocol. The team has extensive experience working on hydrogen compressor technologies for fueling applications and also has real-world experience installing retail and industrial hydrogen refueling stations.

H_2MAX - Product Portfolio

H_2 Units

- Double acting reciprocating piston booster
- Transportable H_2-trailer
- High-quality materials are used for maximum resistance
- Control panels with logical design ensure safe operation
- CE Ex II 2G/2D IIC compliant

H_2 Components

- Temperature ranges from -20 °C to +80 °C for bank operation from -73 °C to +80 °C for dispenser operation
- Components include bank valves, pressure and temperature transmitters, safety valves
- Valve manifolds for handling pressure cascades
- CE Ex II 2G/2D IIC compliant








H_2 Test Systems

- Test systems for different test processes: proof pressure, leakage, batch tests, pressure cycle tests, burst test
- Flexible fixtures and protective devices for tanks with various lengths and volumes
- Testing processes in accordance with EC79/2009 or ECE R110

Service Department

- Commissioning, maintenance and on-site repairs, system modernization
- Software modifications and adjustments, system relocation
- High pressure training
- Service and maintenance contracts, original spare parts supply
- Technical support for immediate assistance by phone, optimization and remote maintenance

MAX H_2 - Hydrogen Technology

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