



Hydrogen Ecosystem Solutions

Components and systems for use with gaseous and liquid Hydrogen in infrastructure and on-vehicle applications



ENGINEERING YOUR SUCCESS.



A World of Hydrogen Technology

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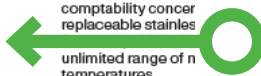
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Seal-Lok™ Xtren Fittings
for cryogenic LH2 and fueling system temperature compatibility

A Parker patented design expands the O-ring applications where sealing is not an issue due to temperature compatibility concerns. replaceable stainless steel O-rings for an unlimited range of temperatures.



Need more technical information?

If you have a physical copy of this brochure, scan the dedicated QR Code for each product series on your iOS or Android device to discover more detailed technical specifications, part numbers and further content. Else, click on the QR code.

Get in contact!

We'd love to hear what your challenges are. Scan or click the QR code for a list of Parker locations.



WARNING

FAILURE, IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

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Offer of Sale

The items described in this document are available for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. Any sale contract entered into by Parker will be governed by the provisions stated in Parker's standard terms and conditions of sale (copy available upon request).

Parker is supporting global decarbonization through a broad range of solutions for a variety of Hydrogen applications from production of blue and green Hydrogen through to on board vehicles.



There is a major shift in today's world, focusing on the environment of tomorrow. This has paved the way for cleaner energy sources and has encouraged the move to renewable fuels.

Parker's experience helping customers solve for Hydrogen's complexities dates to the '60s when our work helped land people on the moon by supplying 21 systems to the Apollo lunar mission including Hydrogen and Oxygen systems for the onboard fuel cell. Today, by enabling safe, effective production of Hydrogen technology, Parker is helping that same clean-energy technology power countless organizations.

All around the world, manufacturers are becoming more conscious of the environment and placing increased emphasis on reducing their carbon footprint. A significant portion of this focus has been dedicated to reducing the environmental impact on our world through the transition to alternative fuel sources.

There are now many different avenues to efficient energy via renewable resources. Taking much of the spotlight today is Hydrogen, whose versatility is evident in the production of fertilizers, powering of vehicles and heating of homes, all without contributing to greenhouse gas emissions.

Hydrogen will ultimately play an influential role in achieving 'net zero' emissions standards for future sustainability. However, Hydrogen does not come without its production challenges and compliance requirements.

For over 60 years, Parker has been at the forefront of the production, distribution, and utilization of Hydrogen as a clean fuel source. **Allow us to partner with you to deliver clean technology to your markets.**

a member of the **Hydrogen Council**



Infrastructure

PRODUCTION, STORAGE AND DISTRIBUTION TO 70 BAR

The first step is harnessing energy sources to power Hydrogen production. Parker's engineering leadership and global reach put solutions in place across multiple technologies. The mass availability of Hydrogen gives businesses a real opportunity to reduce their carbon footprint. Parker solutions, from fluid conveyance to precision filtration systems are critical, especially in demanding, corrosive, pressured and heat-intensive environments.



Electrolyzers

Optimizing flow with small and low bore conveyance solutions. Controlling pressure, temperature and humidity of gas and liquids.



Storage

Safe control and pressurization of gas, liquids, and cryogenic applications.



Distribution

Integrating and connecting technologies across a global distribution network. Support and expertise in certification and approvals for safe passage across land and sea.

How to choose components and materials for Hydrogen applications

[WATCH VIDEO](#)

An in-depth discussion based on the material science of Hydrogen components, including 316 stainless steel and TPU soft seals, and how they perform and react in Hydrogen applications.



Parker is supporting the global decarbonization efforts through a broad range of solutions for a variety of Hydrogen infrastructure applications. Our Hydrogen-compatible components and systems enable safe and efficient operation from vacuum to 1034 bar nominal pressure (15,000 psi).

DISPENSING TO 1034 BAR

Hydrogen dispensing stations incorporate a range of applications where you will find Parker products. From compressors, high pressure storage tanks to dispensing Hydrogen to vehicles. Parker technology meets the refueling pressure parameters that the vehicle requires, either 35 MPa or 70 MPa. Please note, the pressure unit of measure for each product series within this brochure is first expressed in bar, with its psi and MPa equivalent.



Dispensing

Control of flow with small and low bore fluid conveyance solutions. Maintaining pressure and temperature of Hydrogen.

Fluid Conveyance Solutions for Hydrogen Infrastructure Applications

Small bore fittings, couplings, hose, and tube for gaseous and liquid Hydrogen in a range of sizes, pressures, and temperatures.

FLUID CONVEYANCE



Two Ferrule Tube Fittings A-LOK® Series for all Hydrogen applications

Designed to achieve quality leak-free connections, these fittings provide reliable operation in cryogenic, pressure and thermal cycling and vibration applications. Manufactured at an IATF 16949 certified plant and EC-79 approved for Hydrogen service.

- 1/4" to 1" (6 mm to 25 mm)
- Up to 437 bar (6,338 psi, 43.7 MPa)
- -253°C to +538°C (-423°F to +1000°F)
- Hydrogen Form: Gas, Liquid



Single Ferrule Tube Fittings CPI™ Series for all Hydrogen applications

Designed to achieve quality leak-free connections on-board Hydrogen-powered vehicles. These fittings provide reliable operation in cryogenic, pressure and thermal cycling and vibration applications.

- 1/4" to 1" (6 mm to 25 mm)
- Up to 437 bar (6,338 psi, 43.7 MPa)
- -253°C to +538°C (-423°F to +1000°F)
- Hydrogen Form: Gas, Liquid



Permanent Tube Fittings Phastite® Series for non-weld Hydrogen systems

Permanent compression fitting offers an extremely quick, easy, and simple way of permanently connecting tube. Delivers a huge reduction in total installation cost when compared to welding connections.

- 1/4" to 1" (6 mm to 25 mm)
- Up to 1,034 bar (15,000 psi, 103.4 MPa)
- -45°C to +93°C (-40°F to +200°F)
- Hydrogen Form: Gas



Instrumentation Quick Couplers for Hydrogen dispenser panels

Designed for quick connect / disconnect of gaseous Hydrogen in point of use and sampling systems. Suitable from Vacuum to full rated pressure.

- 1/4" to 1/2" (6 mm to 12 mm) A-LOK® connections
- Up to 3,000 psi (207bar)
- -30°C to +204°C (-22°F to +399°F)
- Hydrogen form: Gas



PRODUCTION, DISTRIBUTION, STORAGE & DISPENSING

Alkaline Electrolyzer, PEM Electrolyzer, Steam Methane Reformation, Booster Compressor, High and Low Pressure Buffer Storage, Dispensers



Seal-Lok™ Xtreme Tube Fittings

for cryogenic LH2/LNG storage and fueling systems and high temperature combustion turbines.

A Parker patented solution which expands the O-ring face seal SAE J1453 connection to critical applications where elastomeric sealing is not an acceptable solution due to temperature or chemical compatibility concerns. It uses a replaceable stainless steel metal face seal, which allows for a virtually unlimited range of media and temperatures.



- 1/4" to 2" (6 mm to 50 mm)
- Up to 414 bar (6,000 psi, 41.4 MPa)
- -200°C to 650°C (-325°F to 1200°F)
- Hydrogen Form: Liquid



SCP04 Pressure Sensor

for PEM and alkaline electrolyzers

The SCP04 pressure sensor is designed to meet the chemical and physical requirements in various Hydrogen applications such as production, fueling, or transportation of Hydrogen.

- G1/1 BSPP ED; 1/4 NPT; 7/16-20 UNF
- Up to 1,000 bar (14,500 psi, 100 MPa)
- -40°C to +125°C (-40°F to +257°F)
- Hydrogen Form: Gas



Medium Pressure Fittings Parker Autoclave

for all Hydrogen applications

Designed for applications that require higher flow rate capability. Manufactured from high tensile strength cold worked 316/316L stainless steel material as standard. This medium pressure range has all the benefits of the high-pressure version. These fittings are designed for use with the 20SM Series valves and medium pressure tubing according to ASME B31.3 Chapter IX standards.



- 1/4" to 1"
- Up to 1,034 bar (15,000 psi, 103.4 MPa)
- -253°C to +538°C (-423°F to +1000°F)
- Hydrogen Form: Gas, Liquid



Hydrogen Hose 2440P-04V32

for Hydrogen dispenser panels

Designed to match high demands of high-pressure Hydrogen transfer, it offers high level of reliability, robustness and a long-life cycle and is optimized for operation in Hydrogen filling stations working with pressure class H70 equipment. Additionally, tight bend radius enables more convenient usage and installation in limited spaces.



- 1/4"
- Up to 1,034 bar (15,000 psi, 103.4 MPa)
- -40°C to +85°C (-40°F to +185°F)
- Hydrogen Form: Gas

Fluid Conveyance Solutions for Hydrogen Infrastructure Applications

Small bore fittings, couplings, hose, and tube for gaseous and liquid Hydrogen in a range of sizes, pressures, and temperatures.

FLUID CONVEYANCE



LIQUIfit® Push-In Fittings with Metal Adaptor

for Hydrogen electrolyzer and fuel cells - Hydrogen, Oxygen, or liquid circuit

The LIQUIfit® push-in fittings with stainless steel metal adaptor and cartridges ensure reliable and compact Hydrogen connections combined with excellent robustness. The fittings which are 100% leak-tested are available in a wide range of shapes and configurations.

- 4 mm to 16 mm
- Up to 10 bar (145 psi, 1 MPa)
- -10°C to +95°C (14°F to +203°F)
- Hydrogen Form: Gas



LIQUIfit® Push-In Cartridges

for Hydrogen electrolyzer and fuel cells - Hydrogen, Oxygen, or liquid circuit

Suitable for low pressure Hydrogen systems up to 10 bar. Fully integrated it provides an instant connection between the housing and the tubing. Its patented sealing technology guarantees reliability and compactness connections.

- 4 mm to 12 mm
- Up to 10 bar (145 psi, 1 MPa)
- -10°C to +95°C (14°F to +203°F)
- Hydrogen Form: Gas



Series 200 Couplings

for PEM and alkaline electrolyzers

The safety dry-break series 200 made of 316L stainless steel is a solution compatible with low-pressure Hydrogen systems up to 2 MPa and allow a non-spill disconnection. Its compactness allows its installation in limited spaces. Our couplings are 100% leak-tested in production. The single-hand operation technology makes quick to install and does not require any tools.

- Nominal Diameter 3/4/6/9/12/19
- Up to 20 bar (290 psi, 2 MPa)
- -15°C to +200°C (5°F to +392°F)
- Hydrogen Form: Gas



Nylon, FEP and PFA Tube

for Hydrogen electrolyzer and fuel cells - Hydrogen, Oxygen, or liquid circuit

Parker's range of Nylon, FEP and PFA tube are compatible with all Hydrogen applications.

- 4 mm to 16 mm
- Up to 30 bar (435 psi, 3 MPa)
- Nylon:
 - 40°C to +100°C (14°F to +212°F)
- PFA and FEP:
 - 40°C to +150°C (14°F to +302°F)
- Hydrogen Form: Gas



PRODUCTION, DISTRIBUTION, STORAGE & DISPENSING

Alkaline Electrolyzer, PEM Electrolyzer, Steam Methane Reformation, Booster Compressor, High and Low Pressure Buffer Storage, Dispensers



LF 3800 Push-In Fittings for Hydrogen electrolyzer and fuel cells

Made of 316L stainless steel this range is suitable for Hydrogen systems up to 30 bar. Thanks to its component material the products are resistant to corrosion in aggressive environments. Hygienic external design for reducing retention zones.

- 4 mm to 12 mm
- Up to 30 bar (435 psi, 3 MPa)
- -25°C to 150°C (-13°F to +302°F)
- Hydrogen Form: Gas



Series 27, 25 and 27 Couplings for Hydrogen production

Series 21, 25 and 27 are suitable for low-pressure Hydrogen systems up to 3 MPa. Its compactness allows its installation in limited spaces. Our couplings are 100% leak-tested in production. The single-hand operation technology is quick to install and does not require any tools.

- Nominal diameter:
 - 21 Series: 5 mm
 - 25 Series: 7.4 mm
 - 27 Series: 10 mm
- Up to 30 bar (435 psi, 3 MPa)
- -15°C to +200°C (5°F to +392°F)
- Hydrogen Form: Gas



Parflange® F37 Non-Welded Piping Systems for PEM and alkaline electrolyzers

Parflange® F37 non-welded piping systems utilize standard SAE code 61/62, ISO 6162 and ISO 6164 flange interfaces and includes certified components capable of providing non-welded piping systems up to 60 mm (2"). This technology can dramatically reduce dependency on welding, thus reducing cost and time to assembly.

- Up to 60 mm (2")
- Up to 350 bar (5,075 psi, 35 MPa)
- -40°C to +120°C (-40°F to +248°F)
- Hydrogen Form: Gas, Liquid



EO DPR System for Hydrogen production and storage

The EO progressive ring (DPR) stainless steel tube fitting produces a low to high pressure, leak free connection of tubes and components. It guarantees increased safety, particularly with regard to vibration and flexure stresses in Hydrogen systems.

- 6 mm to 30 mm
- Up to 350 bar (5,075 psi, 35 MPa)
- -40°C to +120°C (-40°F to +248°F)
- Hydrogen Form: Gas

Valve Solutions for Hydrogen Infrastructure Applications

Ball, needle, lift, globe, and check valves for gaseous and liquid Hydrogen in a range of sizes, pressures, and temperatures.



VALVES



Medium Pressure Needle Valves 20SM Series Parker Autoclave for all Hydrogen applications

ISO 19880-3 certified 20SM Series Needle Valves (HYG option) have unique stem/seat and packing design. The valves are available with two different styles of connection options including cone and thread and MPI™. ISO 19880-3 certified 20SM Series Needle Valves (HYG option) have unique stem/seat and packing design.



- 1/4" to 1"
- Up to 1,378 bar (20,000 psi, 137.8 MPa)
- -253°C to +316°C (-423°F to +601°F)
- Hydrogen Form: Gas, Liquid



Medium Pressure Check Valves Parker Autoclave for all Hydrogen applications

These valves are available with two different styles of connection options including cone and thread and MPI™. ISO 19880-3 certified.



- 1/4" to 1"
- Up to 1,378 bar (20,000 psi, 137.8 MPa)
- -253°C to +316°C (-423°F to +601°F)
- Hydrogen Form: Gas, Liquid



Isolation Ball Valves Hi-Pro Series for all Hydrogen applications

High performance two piece bi-directional instrumentation ball valves offer the user full cold working pressure ratings up to 689 bar (10,000 psi)



- 1/4" to 1" (6 mm to 25 mm)
- Up to 689 bar (10,000 psi, 68.9 MPa)
- -54°C to +232°C (-65°F to +450°F)
- Hydrogen Form: Gas



Needle Valves MAN Series for all Hydrogen applications

These valves are designed for multi-turn control of media with regulation or shutoff options for pressures up to 1034 bar (15,000 psi). This double ferrule connection delivers fast, easy make-up and reliable bubble-tight performance.



- 1/4" to 1"
- 1,034 bar (15,000 psi, 103.4 MPa)
- -253°C to +316°C (-423°F to +601°F)
- Hydrogen Form: Gas, Liquid

PRODUCTION, DISTRIBUTION, STORAGE & DISPENSING

Alkaline Electrolyzer, PEM Electrolyzer, Steam Methane Reformation, Booster Compressor, High and Low Pressure Buffer Storage, Dispensers



Globe Valves - Bestobell Series

for all cryogenic Hydrogen applications

Cryogenic globe valves feature an innovative loose flange bolted bonnet design that allows for thermal expansion and contraction, therefore eliminating leakage at the bonnet gasket.

- DN15 to DN100 (1/2" to 4")
- Up to 50 bar (725 psi, 5 MPa)
- -253°C to +80°C (-423°F to +176°F)
- Hydrogen Form: Gas, Liquid



Lift Check Valves - Bestobell Series

for all cryogenic Hydrogen applications

These valves are used in pipelines to prevent the back flow of the media. Parker Bestobell cryogenic lift check valves feature a cone seat design for a tight shut-off. A guideway keeps the motion of the disc on a vertical line, so the check valve can re-seat.

- DN15 to DN100 (1/2" to 4")
- Up to 50 bar (725 psi, 5 MPa)
- -253°C to +80°C (-423°F to +176°F)
- Hydrogen Form: Gas, Liquid



Pneumatically Actuated Globe Valves - Bestobell

for all cryogenic Hydrogen applications

Designed to eliminate leakages, maximise lifetime operation and reduce maintenance and spares cost.

- DN15 to DN100 (1/2" to 4")
- Up to 50 bar (725 psi, 5 MPa)
- -253°C to +80°C (-423°F to +176°F)
- Hydrogen Form: Gas, Liquid



Valve Solutions for Hydrogen Infrastructure Applications

Proportional relief, regulator, excess flow shutoff valves and sample conditioning systems for gaseous Hydrogen in a range of sizes, pressures, and temperatures.

VALVES



Proportional Relief Valves HPRV Series for Hydrogen gas systems

This compact proportional relief valve provides an automatic over-pressure protection mechanism for sensitive equipment. CE marked and certified to the highest Category-IV level of the Pressure Equipment Directive (PED), the HPRV valve's design provides users with accurate and consistent cracking and resealing operation.



- 1/4" (6 mm)
- Up to 414 bar (6,000 psi) 41.4 MPa)
- -57°C to +204°C (-70°F to +399°F)
- Hydrogen Form: Gas



Pressure Regulators IR4000 Series

for pressure reduction of Hydrogen gas

This single-stage pressure regulator delivers high performance pressure reduction for instrumentation systems. Close tolerances and tight alignment of moving components minimize hysteresis and improve cycle life.



- 1/4" (6 mm)
- Up to 276 bar (4,000 psi, 27.6 MPa)
- -40°C to +260°C (-40°F to +500°F)
- Hydrogen Form: Gas

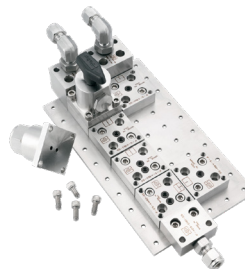


Excess Flow Shutoff Valves FS190 Series for Hydrogen gas delivery

Automatically shuts off the supply of Hydrogen in the event of a downstream rupture of the supply line.



- 1/4" (6 mm)
- Up to 241 bar (3,500 psi, 24.1 MPa)
- -23°C to +66°C (-90°F to +151°F)
- Hydrogen Form: Gas



Modular Sample Conditioning System IntraFlow™

for Hydrogen sampling and analysis

Modular fitting and valve system developed specifically for analytical, complex general purpose instrumentation flow control systems. These compact systems meet ISA/ANSI 76.00.02 requirements.



- 1/8"
- Up to 34 bar (435 psi, 3.4 MPa)
- -57°C to +204°C (-71°F to +399°F)
- Hydrogen Form: Gas

PRODUCTION, DISTRIBUTION, STORAGE & DISPENSING

Alkaline Electrolyzer, PEM Electrolyzer, Steam Methane Reformation,
Booster Compressor, High and Low Pressure Buffer Storage, Dispensers



Sealing Solutions for Hydrogen Infrastructure Applications

Seals, O-Rings, Gaskets, Gels, Connectors, Washers for Hydrogen production, storage, and transportation applications.

ENGINEERED MATERIALS



FlexiSeal® Seals for Hydrogen production, storage, and transportation

The FlexiSeal® design combines a polymer jacket (typically PTFE) around a metal spring (typically CoCrNi) remains ductile at cryogenic temperatures. The polymer jacket resists shrinkage while spring material resists Hydrogen embrittlement. Polymer compounds with very low permeation leakage are available, as well as extra-large seals sizes up to 4.5 meters in diameter for Hydrogen generator sealing, flanges and gasket seals.



- 0.25" to 118" (6.35 mm to 3 m)
- Up to 1000 bar (14,000 psi, 100 MPa)
- -270°C to 870°C (-454°F to 1600°F)



Metal C-Seals and Flange Seals for Hydrogen storage and transportation

Metal C-seals and flange seals use jacket strength and hydrostatic forces to increase sealing and are suitable for use with uneven flanges. Used in both face seal and axial seal applications, they are used in Hydrogen storage and transportation. Parker's metal seals are available in a wide of materials, plating, and cross-sectional shapes such as circular, oval, and other custom shapes.



- 0.25" to 118" (6.35 mm to 3 m)
- Up to 52 bar (754 psi, 5 MPa)
- Cryogenic temperature to 870°C (1600°F)



Polyurethane O-Rings and Rod Seals for Hydrogen production, storage, and transportation

Parker O-rings and rod-seals made of polymers such as Resilon® P4300 and Thermoplastic Urethane (TPU) P5009 deliver resilience, strength, and thermal stability with excellent resistance to gap extrusion and explosive decompression. Used in both static and dynamic applications, they have excellent cold flexibility and good aging resistance for long service.

- AS568B inch, DIN 3771 metric



Butyl and EPDM O-Rings for Hydrogen production, storage, and transportation

Parker butyl rubber O-rings such as B8885 and B0612 deliver excellent low permeation, low temperature and high temperature properties, and low swelling under Hydrogen at atmospheric pressures. EPDM materials such as E8556 and E0667 deliver cost-effective sealing with good all-around performance. Both Butyl and EPDM O-rings are used in static applications in Hydrogen production, storage, and transportation.



- AS568B inch, DIN 3771 metric

PRODUCTION, DISTRIBUTION, STORAGE & DISPENSING

Alkaline Electrolyzer, PEM Electrolyzer, Steam Methane Reformation,
Booster Compressor, High and Low Pressure Buffer Storage, Dispensers



Vibration Isolators and Flexible Couplings

for Hydrogen storage and transportation

Designed to support and protect equipment in all types of industrial applications, our customizable portfolio of elastomeric mounts and bushings provide reliable and cost-effective solutions to isolate vibration and shock, accommodate motion, and decrease noise for use during Hydrogen storage and transportation.



Parker Cross Reference and Competitor Interchange

SCAN HERE TO ACCESS

Parker has over one million part numbers cross referenced to competitor, OEM, Parker Serial Numbers or PTS, even Parker to Parker parts!



Filtration Solutions for Hydrogen Infrastructure Applications

Stand-alone and integrated filtration and gas generation solutions specifically designed for the manufacturing and distribution of Hydrogen for fueling applications.

FILTRATION



Nitrosource Nitrogen Generator for Hydrogen electrolyzers

Advanced Nitrogen Gas Generation technology enables customers to take charge of their gas supply, 24/7. Utilizing compressed air, gas generators deliver a continuous supply of nitrogen gas - conveniently and cost effectively. The modular Nitrosource range is available in several sizes, gas purities and flow rates to perfectly match the customer's application. Nitrogen gas can typically be used for purging and inerting applications to ensure safety as well as preventing icing on couplings for high pressure filling and gas transfer systems.

- Flow rates from 1m³/h to 220m³/h from a single bank with multi bank systems delivering over 1000m³/h depending on purity
- Gas purity from 5% to 10 ppm maximum remaining Oxygen content with a pressure dew point of at least -65°C (-85°F)
- Minimum Air Inlet Pressure: 5 barg
- Hydrogen Form: Gas



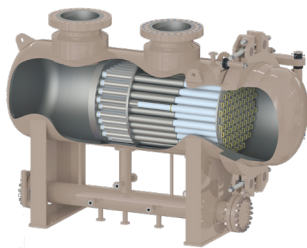
Hyperchill and Hyperchill Plus Chiller for Hydrogen electrolyzers

Extremely compact and easy to use, Hyperchill and Hyperchill Plus are designed for safe and reliable operation in various working conditions while providing a precise and accurate control of the process fluid temperature. The availability of a wide range of accessories and options makes Hyperchill and Hyperchill Plus a very flexible solution that fits the needs of all industrial applications.

- Maximum cooling capacity from 1.7 to 360 kW @ 25°C ambient and 15°C water temperature
- Operating water temperature range: 5°C (optional -10°C) to 30°C
- Power supply voltage 230V / 1ph / 50Hz or 400V / 3ph / 50Hz
- Hydrogen Form: Gas

PRODUCTION, DISTRIBUTION, STORAGE & DISPENSING

Alkaline Electrolyzer, PEM Electrolyzer, Steam Methane Reformation, Booster Compressor, High and Low Pressure Buffer Storage, Dispensers

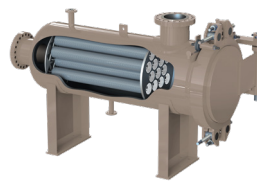


PEACH Gemini PuraSep® Gas Filter-Coalescer for Hydrogen electrolyzers

A horizontal gas filter-coalescer that provides superior performance in a remarkable trouble-free design. It is widely used for protecting critical equipment from solid and liquid contaminants that can cause damage and costly repairs. The Gemini is a proven winner in the field, doing the work of a gas filter-separator and vertical gas coalescer combined, delivering ultra-clean gas with high efficiency removal of solid and liquid contaminants, while effectively handling higher inlet solids and liquid loads than conventional gas coalescers. Suitable for all gas streams including Hydrogen and Oxygen.



- Sized to meet customer specific requirements
- Operating temperatures up to 200°C (392°F). Design temperature to suit
- All recognized pressure vessel codes such as ASME Code Section VIII, PED etc.
- Hydrogen Form: Gas



XstreamPure® High Flow Liquid Filter for Hydrogen electrolyzers

High liquid filtration performance is important to maintain a clean liquid stream that protects process equipment, provides quality final products, and minimizes operation costs. The vessel is designed with large diameter cartridges that allow for higher flow rates, significantly reducing the number of cartridges to change out and the vessel footprint versus traditional liquid filters. The inside-to-outside flow through the cartridge ensures contaminant is captured within the cartridge allowing a cleaner cartridge extraction during change-outs and adding enhanced process integrity. Filter elements are available in both synthetic and metallic medias.



- Optimal Flow Rate @ 1CP up to 5,800 m³/hr. (25,500 GPM) with standard layouts
- All liquids used in electrolyzers and other Hydrogen production processes (e.g. Steam Methane Reformers)
- No of cartridges 1 - 85 in standard layouts. Higher number of elements (flow rates) available in special designs

Fuel Conveyance Solutions for On Vehicle Hydrogen Applications

Small bore fittings, couplings, hose, and tube for gaseous and liquid Hydrogen in a range of sizes, pressures, and temperatures.

FUEL CONVEYANCE



**Two Ferrule Tube Fittings
A-LOK® Series**
for fuel distribution

Designed to achieve quality leak-free connections on-board Hydrogen-powered vehicles. These fittings provide reliable operation in cryogenic, pressure and thermal cycling and vibration applications. Manufactured at an IATF 16949 certified plant and EC-79 approved for Hydrogen service.



- 1/4" to 1" (6 mm to 25 mm)
- NWP 350 bar (5,075 psi, 35 MPa)
- -40°C to +120°C (-40°F to +248°F)
- Hydrogen Form: Gas



**Single Ferrule Tube Fittings
CPI™ Series**
for fuel distribution

Designed to achieve quality leak-free connections on-board Hydrogen-powered vehicles. These fittings provide reliable operation in cryogenic, pressure and thermal cycling and vibration applications.



- 1/4" to 1" (6 mm to 25 mm)
- NWP 350 bar (5,075 psi, 35 MPa)
- -40°C to +120°C (-40°F to +248°F)
- Hydrogen Form: Gas



**O-Lok® / Seal-Lok™
H22/H2P Tube Fittings**
for Hydrogen storage tanks

H22 connectors combine Hydrogen compatibility with the performance and reliability of SAE J1453 O-Ring Face Seal (O-Lok®) connections. The Hydrogen specific H2P-port design is the basis for an improved pressure resistance up to 700 bar. A special soft sealing compound ensures safety in terms of Hydrogen permeation and explosive decompression.

- 1/4" to 1/2" (6 mm to 12 mm)
- NWP 700 bar (10,152 psi, 70 MPa)
- -55°C to +85°C (-67°F to +185°F)
- Hydrogen Form: Gas



Heated Hose Solutions
for Purge lines on fuel cells to keep water from freezing

Designed for heating and conveying media such as water to keep lines from freezing. Parker's heated hoses are uniquely made with both an extruded sheath and an overmold for protection. Heated hoses with PA inner tube are chemically compatible with Hydrogen.



- 14.5 mm O.D.
- Up to 10 bar (145 psi, 1 MPa)
- -40°C to 120°C (-40°F to +248°F)
- Gas, Liquid

ON VEHICLE

Gaseous and Liquid Hydrogen Tank Systems, Fuel Delivery to Fuel Cell



Medium Pressure Fittings Parker Autoclave

for fuel distribution

Designed for applications that require higher flow rate capability. Manufactured from high tensile strength cold worked 316 stainless steel material as standard. This medium pressure range has all the benefits of the high-pressure version. These fittings are designed for use with the 20SM Series valves and medium pressure tubing according to ASME B31.3 Chapter IX standards and EC-79 approved.



- 1/4" to 1"
- NWP 700 bar (10,152 psi, 70 MPa)
- -40°C to +120°C (-40°F to +248°F)
- Hydrogen Form: Gas



SCP04 Pressure Sensor

for general Hydrogen

The SCP04 pressure sensor is designed to meet the chemical and physical requirements in various Hydrogen applications such as production, fueling, or transportation of Hydrogen.

- G1/1 BSPP ED; 1/4 NPT; 7/16-20 UNF
- Up to 1,000 bar (14,500 psi, 100 MPa)
- -40°C to +125°C (-40°F to +257°F)
- Hydrogen Form: Gas



Parker Grade Tube for A-LOK®, CPI™, MPI™, Autoclave, O-Lok® and Seal-Lok™ Tube Fittings

for Hydrogen dispenser panels

Parker Grade tubing is a unique specification of tubing and is optimal in terms of hardness, ovality, chemistry, and dimensional tolerances ensuring ideal properties for the fitting. Available in 316 stainless steel.



- Sizes, pressure, and temperature are based on the selection of fitting connection
- Hydrogen Form: Gas, Liquid

Addressing the Challenge of Hydrogen Embrittlement in Metallurgy

WHITE PAPER



Hydrogen is the most abundant element in nature and its versatility can offer compelling advantages as an accessible, sustainable, and efficient alternative source of energy.



Valve Solutions for On Vehicle Hydrogen Applications

Solenoid, needle, lift, globe, and check valves for gaseous and liquid Hydrogen in a range of sizes, pressures, and temperatures.



VALVES



Safety Relief Valves - Bestobell
for all cryogenic Hydrogen applications

Designed to protect piping, cryogenic static storage, and trailer tanks against damage from excessive overpressure. A lift-limiting stop helps prevent valve instability when discharging from or into the lengthy piping runs.

- DN10, DN15, DN20
- Up to 40 bar (580 psi, 4 MPa)
- -253°C to +65°C (-423°F to +149°F)
- Hydrogen Form: Liquid



Lift Check Valves - Bestobell
for all cryogenic Hydrogen applications

These valves are used in pipelines to prevent the back flow of the media. Parker Bestobell cryogenic lift check valves feature a cone seat design for a tight shut-off. A guideway keeps the motion of the disc on a vertical line, so the check valve can reseal.

- DN15 to DN100 (1/2" to 4")
- Up to 50 bar (725 psi, 5 MPa)
- -253°C to +80°C (-423°F to +176°F)
- Hydrogen Form: Liquid



Globe Valves - Bestobell
for all cryogenic Hydrogen applications

Cryogenic globe valves feature an innovative loose flange bolted bonnet design that allows for thermal expansion and contraction, therefore eliminating leakage at the bonnet gasket.

- DN15 to DN100 (1/2" to 4")
- Up to 50 bar (725 psi, 5 MPa)
- -253°C to +80°C (-423°F to +176°F)
- Hydrogen Form: Liquid



Proportional Control Modules
for Hydrogen fuel cell power control

Proportional (PWM) control with integrated safety shut off valve and exhaust, designed for heavy duty application on board of vehicles.

- Max flow rate 600 LPM
- 0-20 bar Shut-Off, 8-12 bar regulated pressure range
- -40°C to +120°C (-40°F to +248°F)
- Hydrogen Form: Gas

ON VEHICLE

Gaseous and Liquid Hydrogen Tank Systems, Fuel Delivery to Fuel Cell



2 Way Solenoid Valves for Low Pressure Safety Shut Off for Hydrogen storage tanks

2/2-way solenoid valves for safety shut-off application, normally closed, stainless steel, available in multiple variances, designed for heavy duty application on board of vehicles.

- Up to 11 mm orifice design
- Up to 22 bar (319 psi, 2.2 MPa)
- -40°C to +85°C (-40°F to +185°F)
- Hydrogen Form: Gas



2 Way Solenoid Valve for High Pressure Safety Shut Off for Hydrogen storage tanks

2/2-way solenoid valves for high pressure safety shut-off application, normally closed, stainless steel, designed for heavy duty application on board of vehicles.

- Up to 8 mm orifice design
- NWP 350 bar (5,076 psi, 35 MPa)
- -50°C to +85°C (-58°F to +185°F)
- Hydrogen Form: Gas



Proportional Valves for Hydrogen fuel cell power control

Proportional control valves for Hydrogen, optimize design to large flow control without high-speed turbulence, pressure balance design, reduce coil power requirement, fine linear control by low friction design, designed for heavy duty application on board of vehicles.

- Up to 15 mm orifice design
- Max flow rate >1700 LPM
- Up to 15 bar (217 psi, 1.5 MPa)
- -40°C to +120°C (-40°F to +248°F)
- Hydrogen Form: Gas

5 Key Criteria of a Hydrogen Fitting to Ensure Safety, Reliability and Performance

[DISCOVER MORE HERE](#) ►

Fittings used in Hydrogen production, Hydrogen fuel cells and refueling stations must meet key performance criteria to ensure safety, reliability, and performance in application.



Valve Solutions for On Vehicle Hydrogen Applications

Ball and proportional relief valves for gaseous Hydrogen in a range of sizes, pressures, and temperatures.



VALVES



Ball Valves B Series
for Hydrogen delivery systems

Manual isolation valve for system refueling and venting. The free floating ball design provides seat wear compensation. Micro-finished ball provides a positive seal.

- 1/8" to 3/4" (3 mm to 18 mm)
- Up to 414 bar (6,000 psi, 41.4 MPa)
- -54°C to +232°C (-65°F to +450°F)
- Hydrogen form: Gas



Ball Valves, Trunnion Style, HB Series
for Hydrogen delivery systems

Manual isolation valve for system refueling and venting. The upper and lower trunnion bearings enhance the resistance of the trunnions against seizure, and increase the valve life in extreme applications. The compact and rugged design employs spring-loaded seats for high cycle life and low operating torques at pressures up to 10,000 psi (689 bar)

- 1/8" to 1/2" (6 mm to 12 mm)
- Up to 689 bar (10,000 psi, 68.9 MPa)
- -54°C to +204°C (-65°F to +399°F)
- Hydrogen form: Gas



Isolation Ball Valves Hi-Pro Series
for Hydrogen delivery systems

Manual isolation valve for system refueling and venting. This true two piece design reduces body leak paths to a minimum. With the added opportunity to select integral compression ends the user can eliminate the use of taper threads and thread sealant. This avoids system contamination, further reduces leakage paths, installation costs, weight, and space.

- 1/4" to 1" (6 mm to 25 mm)
- Up to 689 bar (10,000 psi, 68.9 MPa)
- -54°C to +232°C (-65°F to +450°F)
- Hydrogen Form: Gas



Proportional Relief Valves HPRV Series
for Hydrogen gas systems

This compact proportional relief valve provides an automatic over-pressure protection mechanism for sensitive equipment. CE marked and certified to the highest Category-IV level of the Pressure Equipment Directive (PED), the HPRV valve's design provides users with accurate and consistent cracking and resealing operation.

- 1/4" (6 mm)
- Up to 414 bar (6,000 psi) 41.4 MPa)
- -57°C to +204°C (-70°F to +399°F)
- Hydrogen Form: Gas



ON VEHICLE

Gaseous and Liquid Hydrogen Tank Systems, Fuel Delivery to Fuel Cell



Hydrogen FUEL CELL BUS

Reduce Carbon Emissions of Commercial Vehicles

[READ THE CASE STUDY](#) ▶

Discover how Parker helping to pioneer technology that allows commercial vehicle fleet owners to include hydrogen among their running fuels.



Sealing Solutions for On Vehicle Hydrogen Applications

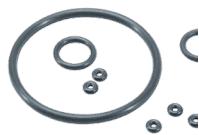
Seals, O-Rings, Gaskets, Gels, Connectors, Washers for Hydrogen fuel cell applications including the tank system, power electronic, stack and subcomponents.

ENGINEERED MATERIALS



Polyurethane O-rings and Rod Seals

for on vehicle Hydrogen applications



Parker O-rings and rod-seals made of polymers such as Resilon® P4300 and Thermoplastic Urethane (TPU) P5009 deliver resilience, strength, and thermal stability with excellent resistance to gap extrusion and explosive decompression. Used in both static and dynamic applications, they have excellent cold flexibility and good aging resistance for long service.

- AS568B inch, DIN 3771 metric



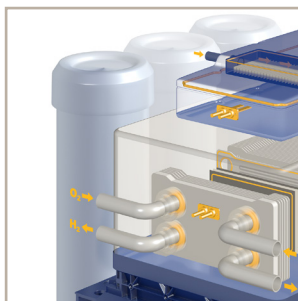
Butyl and EPDM O-rings

for on vehicle Hydrogen applications

Parker butyl rubber O-rings such as B8885 and B0612 deliver excellent low permeation, low temperature and high temperature properties, and low swelling under Hydrogen at atmospheric pressures. EPDM materials such as E8556 and E0667 deliver cost-effective sealing with good all-around performance. Both Butyl and EPDM O-rings are used in static applications on-vehicle.



- AS568B inch, DIN 3771 metric

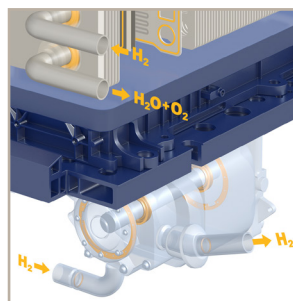


Tank System Products

for Hydrogen fuel cells

In the area of the tank system, we offer special high-pressure sealing solutions with support or backup rings for sealing the tank or the valves. Furthermore, we offer a variety of sealing solutions for the plug-in connections of the tank system, such as our Roll2Seal®, our sealing solution that enables easy assembly of plug-in connections with low pressure requirements.

- High-pressure seals
- Cryogenic seals
- Roll2Seal®
- Press-in-place seals
- Back-up rings
- Connector Seal
- Valve Seals



Sub-Components

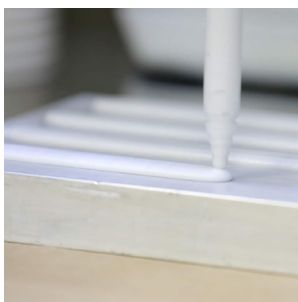
for Hydrogen fuel cells

Parker offers a variety of sealing solutions for the ancillary units, such as compressors, filter and humidification systems and heat exchangers, which are necessary for the function of a fuel cell system. Examples of this are special sealing solutions and materials for the cooling circuit, a wide range of different housing seals or seals for the supply connections.

- Cooling system O-rings
- Liquid silicone rubber perimeter seals
- Perimeter carrier gaskets
- Press-in-place perimeter seals
- Connector seals
- Warp seals
- Roll2Seal®

ON VEHICLE

Gaseous and Liquid Hydrogen Tank Systems, Fuel Delivery to Fuel Cell



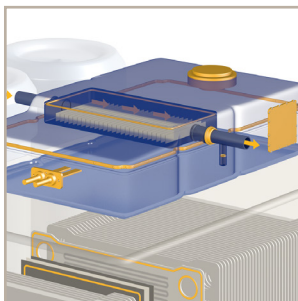
Thermal management for Hydrogen fuel cells

Parker Lord CoolTherm® liquid-dispense, cure-in-place gap fillers couple high thermal conductivity and low viscosity. They provide low stress and improve thermal resistance when compared to thermal pads. CoolTherm® adhesives provide high-bond strength and thermal conductivity. Potting and encapsulation products deliver a robust thermal interface resulting in reliable electronics. These solutions combine structural and thermal requirements for use in Hydrogen fuel cells.



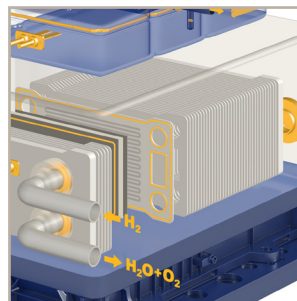
EMI shielding for Hydrogen fuel cells

Parker Chomerics EMI shielding gaskets have an extensive selection of gasketing choices for elastomeric seals, corrosion resistance, environmental seals, and cost-effective electronic shielding for use in Hydrogen fuel cells.



Electronic Power for Hydrogen fuel cells

- Press-in-place coolant, perimeter and environment seals
- Thermal interface materials
- Cooling system O-rings
- Extruded EMI gaskets
- Liquid silicone rubber perimeter seals
- Perimeter carrier gaskets
- Thermal gels
- Overmolded bus bar connectors
- Bus bar connector seals
- Sealing washers
- Roll2Seal®
- Ventilation seals
- Custom molded connectors
- Warp seals
- Smart seals



Stack for Hydrogen fuel cells

- Bipolar plate seals
- Burst- / ventilation seals
- Overmolded bus bar connectors
- Bus bar connector seals
- Sealing washers
- Press-in-place seals
- Connector seals
- Roll2Seal®
- Warp seals
- Smart seals

Filtration Solutions for On Vehicle Hydrogen Applications

As in traditional mobile applications, proper filtration for Hydrogen-fueled vehicles is critical to optimal performance, safety, and comfort.

FILTRATION



Cathode Air Filter
for fuel cells

The fuel cell cathode is very sensitive to impurities and gasses such as nitrogen oxides (NOx) and Sulphur oxides (SOx), Ammonia, Toluene, etc. that can choke and permanently deteriorate the fuel cell stack. Parker cathode air filters will remove these from the air stream protecting and extending the life of the fuel cell.

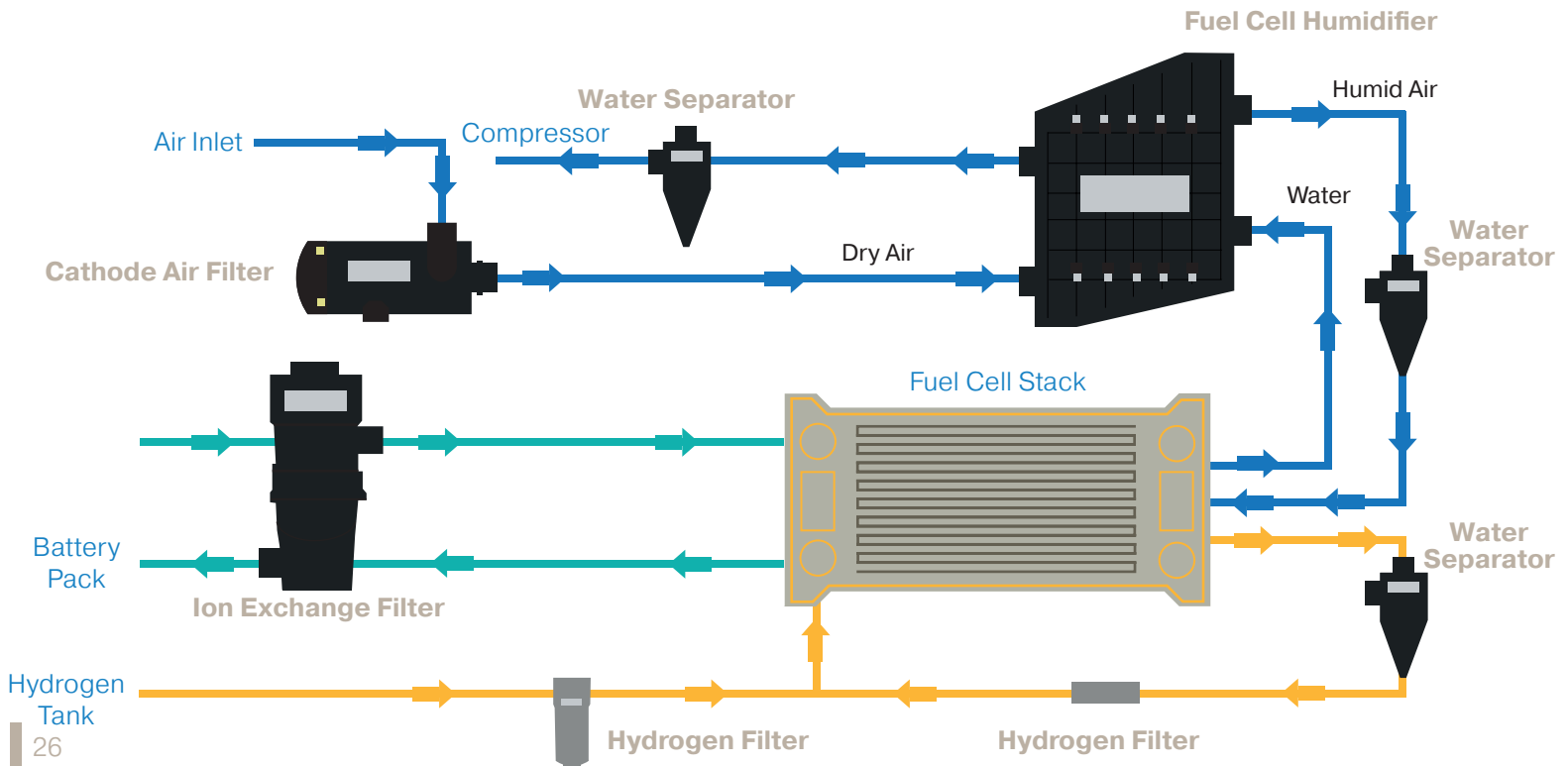
- Flow rate up to 12 LPM
- -40°C to +85°C (-40°F to +185°F)
- Hydrogen Form: Gas



Ion Exchange Filter
for cooling and fuel cell electrolyte

The fuel cell stack is sensitive to electric short circuits therefore the conductivity of the coolant needs to be controlled. Parker Ion-exchange filter reduces the conductivity level of the coolant to optimal levels protecting and extending the life of the fuel cell.

- Flow rate up to 10 LPM
- Electrical conductivity: <math>< 5 \mu\text{S}/\text{cm}</math>
- Capacity: 1000 mEq (anion + cation)
- Hydrogen Form: Gas



ON VEHICLE

Gaseous and Liquid Hydrogen Tank Systems, Fuel Delivery to Fuel Cell



Fuel Cell Humidifier for fuel cell cathode

The proton exchange membrane needs to be kept humid to achieve maximum performance and extend the life of the fuel cell. The Parker hollow fiber humidifier will ensure the optimal level of humidity throughout the lifetime of the product. The hollow fiber proprietary technology delivers extended durability and high resistance to chemical and thermal degradation.

- Flow rate up to 12 LPM
- -40°C to +120°C (-40°F to +248°F)
- Hydrogen Form: Gas



Hydrogen Filter for fuel cells

The fuel cell anode is very sensitive to impurities thus a high-level purity Hydrogen is required not to deteriorate the fuel cell stack. Parker Hydrogen filters will remove the particles and coalesce liquids from the Hydrogen stream and can be used as a safety measure to protect the system. Housing is built from stainless steel material with EPDM seals making it fully compatible with Hydrogen.

- Filtration efficiency: 99.99% @ 0.3µm
- Up to 55 bar (798 psi, 5.5 MPa)
- -40°C to +120°C (-40°F to +248°F)
- Hydrogen Form: Gas

- Air Circuit
- Hydrogen Circuit
- Coolant Circuit

Hydrogen Council

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