

# MARINE FUEL CELL SOLUTIONS

**ZERO-EMISSION POWER from 100 kW to 2+ MW**

The state-of-the-art fuel cell technology in compliance with the latest marine environmental regulations

## Main features

- Modular and scalable
- Power range :  
from 100 kW to 2+ MW
- Robust : designed for  
heavy-duty applications
- Predictive maintenance tool
- Marine approval  
by Bureau Veritas



## OUR PRODUCT : FC-RACK™



## BENEFITS



Zero-emission



Low maintenance



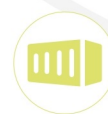
Reliable  
& Efficient



Innovative solution



E-Monitoring  
tool



Containerized  
or integrated  
in machinery  
rooms



Certified solution

**Helion**  
HYDROGEN POWER  
by **ALSTOM**

## Electrical performance

- Nominal Net Power available (kW)
- Voltage range (V)
- Operating maximum current (A)
- Maximum efficiency

## Mechanical structure

- Dimensions L x H x W (mm)
- Weight (kg)

## Hydrogen

- Purity requirements
- Inlet fuel pressure

## Air

- Air quality
- Pressure

## Thermal management

- Inlet water max temperature
- Outlet water max temperature
- Coolant medium

## Operating conditions

- Operating temperature
- Storage temperature
- Humidity

## E-Monitoring

- ALSTOM HealthHub™

## Safety

## Marinization

### FC-RACK™ - 110kW

### FC-RACK™ - 220kW

110	220
317 - 588	317 - 588 <sup>(1)</sup>
470	2 x 470 <sup>(1)</sup>
56%	
2014 x 2253 x 716	
1627	1832
Gaseous hydrogen satisfying ISO 14687 (2019) Grade D Type I	
9,5 - 13,5 bar <sup>(2)</sup>	
Ambient filtered by default / Adaptable depending on environmental conditions	
Atmospheric	
38°C	
70°C	
Freshwater and glycol	
0°C / + 45°C (machinery room)	
-20°C / + 70°C	
≤ 95%	
Remote monitoring and predictive maintenance	
Including secondary barrier with ventilated enclosure	
Approval in principe BV and RINA - Type approval in progress	

(1) Ongoing development for one electrical output to reach 1176 – 634 V / 470 A; (2) Low inlet pressure on going development (<5 bar)

# APPLICATIONS



## Shore to ship power supply

Allowing ships docked in ports to shut down their auxiliary engines and reduce their emissions drastically



## Hotel-load activities

Supplying power to offshore vessels and remote locations at sea



## Zero-emission propulsion

Replacing diesel engines with a sustainable and competitive propulsion



## Power supply for harbour infrastructures

Enabling logistics chain actors to reduce their carbon footprint and to free up space in marine terminals

## ALSTOM Hydrogène S.A.S

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