



# UCT FLUID SOLUTIONS IN THE WORLD OF H<sub>2</sub>HYDROGEN



# We Offer

HEADQUARTERS  
Hayward, California, USA

STOCK  
UCTT (Nasdaq)

FOUNDED  
1991

REVENUE (2021)  
\$2.1B

EMPLOYEES  
~6,000



## Process Instrumentation & Control

- Innovative control systems for critical applications
- One stop solution for petrochemical and chemical industries



## Custom Design & Manufacturing Partner

- High quality, global manufacturing expertise
- Propriety and state of the art production systems (IP, R&D)
- Global outsource manufacturing capabilities



## Component Cleaning Services & Analytics

- High-precision cleaning and coating capabilities
- ChemTrace analysis for trace contaminants in industrial & semiconductor applications





# UCT Fluid Solutions Overview

We develop, innovate and manufacture, state-of-the-art components and systems for gas delivery and process instrumentation



**25%**  
Growth in 3 Years

**5**  
Manufacturing Sites

**300**  
Worldwide  
Distribution Networks

  
Extensive  
Experience

  
Broad Product  
Portfolio



Over **80** Countries Served



# Industry Focused

One-stop-shop for gas delivery and process instrumentation across industries  
Leading Industry 4.0 deployment across industries



Semiconductor



Oil & Gas



Analytical



Hydrogen



Industrial Gases



Power



Automotive

Website: <https://www.uct.com/products/fluid-solutions/default.aspx>

# Leading in Innovation



Let-Lab  
Startup Incubator



Advanced  
Manufacturing Hub



R&D & Industry 4.0  
Labs



Diverse Startup  
Ecosystem



Strategic  
Guidance



Custom  
Solutions

## Innovation Awards

EIC Technology  
Regional  
**2022**

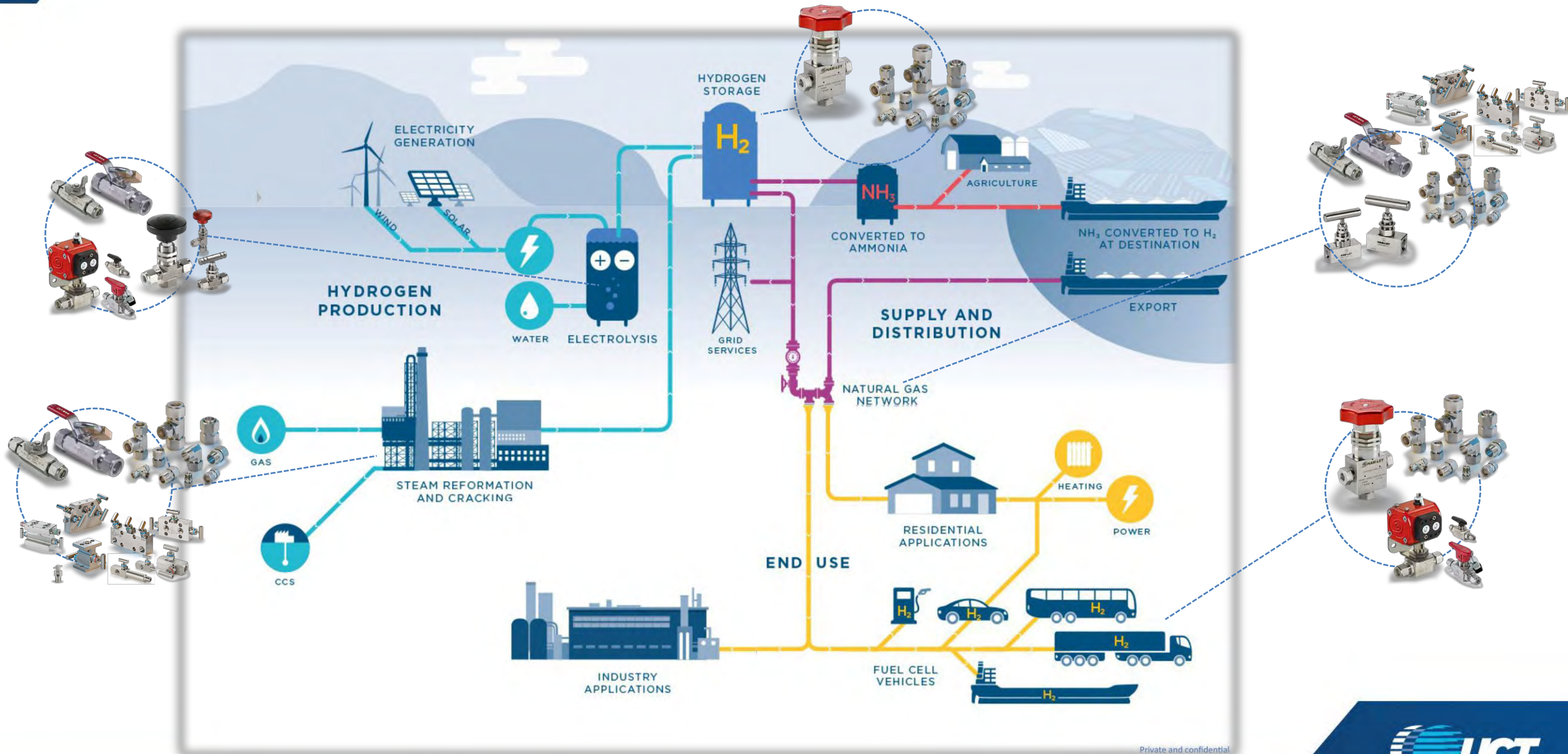
EIC Services &  
Solutions  
**2021**

Flow Control  
Magazine Innovation  
**2019**

Industry of  
Things –  
Best Product  
**2019**



# EFFECTIVE SOLUTIONS ACROSS THE HYDROGEN WORLD



Private and confidential

# Connectors



## LET-LOK®

### Compression Tube Fittings

Sizes: 1/16" to 2" 3mm to 50 mm  
Pressure: Up to 12,000 psi



## ONE-LOK®

### Single Ferrule Fittings

Sizes: 1/16" to 1" 3mm to 25 mm  
Pressure: Up to 12,000 psi



## PIPELINE

### Instrument Weld Fittings

Sizes: 1/16" to 2" 3mm to 25 mm  
Pressure: Up to 11,000 psi



## FLANGS

### Ham-Let Flanges Adapter

Flange Connectors for Let-Lok & NPT  
Male/Female fittings up to 2"



## WELD LINE

### 37° Flare Fittings

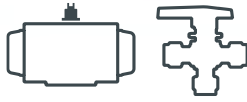
Sizes: 1/8" to 2"  
Pressure: Up to 5,000 psi



Our Tube and Pipe fittings are EC79 certified for onboard vehicles and undergo annual rigorous helium testing by a 3rd party lab to ensure our customers that we keep meeting the highest industry standards.



# Instrumentation Valves & Actuators



PRODUCT PORTFOLIO



**Fugitive Emissions  
Free – EF Series**  
MAWP: 2500 psi (206 bar)  
MAWT: 140°F (60°C)



**High Pressure  
Trunnion Ball Valves –  
TBV Series**  
MAWP: 10000 psi (689 bar)  
MAWT: 446°F (230°C)



**High Performance Ball  
Valves – H-6800 Series**  
MAWP: 6000 psi (413 bar)  
MAWT: 500°F (260°C)



**Heavy Duty Ball  
Valves– H-1700 Series**  
MAWP: 6000 psi (413 bar)  
MAWT: 500°F (260°C)



**3 Piece Ball Valves– H-  
500 Series**  
MAWP: 3000 psi (206 bar)  
MAWT: 450°F (323°C)



**Compact One Piece Ball  
Valves H800 Series**  
MAWP: 3000 psi (206 bar)  
MAWT: 300°F (149°C)



**Ball Valves with Locking  
Device H-700 Series**  
MAWP: 2000 psi (137 bar)  
MAWT: 400°F (204°C)



**Metering Ball Valves  
MBV Series**  
MAWP: 2,000 psi (137 bar)  
MAWT: 300°F (150°C)



**High Pressure Needle  
Valves H-99 Series**  
MAWP: 10000 psi (690 bar)  
MAWT: 1200°F (648°C)



**Integral Bonnets Needle  
Valves H-300U Series**  
MAWP: 5000 psi (345 bar)  
MAWT: 446°F (230°C)



**Metering Valves  
H-1300 Series**  
MAWP: 2000 psi (137 bar)  
MAWT: 400°F (204°C)

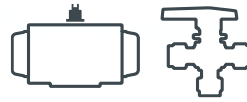


Our Ball valves and Needle valves series are certified to ISO 15848-1, ensuring the lowest fugitive emissions rates and maximum safety for hydrogen handling.





# Instrumentation Valves & Actuators



**Check Valves**  
**H-400 Series**

MAWP: 6000 psi (413 bar)  
MAWT: 400°F 204°C )



**Relief Valves – H-900 & H-900HP Series**

MAWP: 6000 psi (413 bar)  
MAWT: 300°F (148°C)



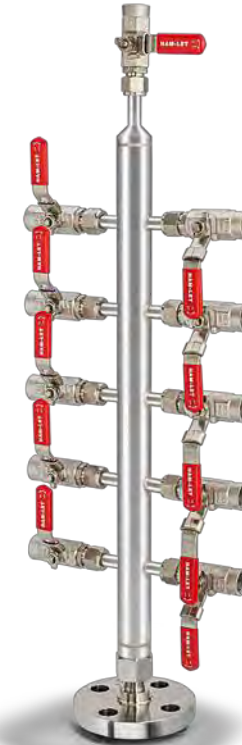
**Filter**  
**H-600 Series**

MAWP: 6000 psi (413 bar)  
MAWT: 248°F (120°C)



**QCLOK**  
**Quick Connector**

MAWP: 1500 psi (103 bar)  
MAWT: 140°F (60°C)



**Media Header**  
**HMH Series**

MAWP: 1000 psi (69 bar)



**Excess Flow Valves**  
**H-911 series**

MAWP: 6,000 psi (413 bar)  
MAWT: 400°F (204°C)

**Pneumatic Actuators**

Pneumatic Rack and Pinion Actuators



# High Pressure

Pressure Range: up to 60,000 psi



## High Pressure Fittings

HHP Series

MAWP: 60000 psi (4136 bar)



## High Pressure Valves

HHP Series

MAWP: 60000 psi (4136 bar)

MAWT: 140°F (60°C)



## High Pressure Check Valves

HHP Series

MAWP: 60000 psi (4136 bar)



## High Pressure Filter

HHP Series

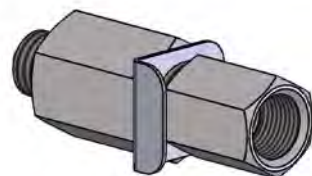
MAWP: 30000 psi (2068 bar)



## High Pressure Quick connectors

HHP Series

MAWP: 36000 psi (2482 bar)



## High Pressure Rupture Disc

HHP Series

MAWP: 60000 psi (4136 bar)



## Nipples & Tubes

HHP Series

MAWP: 60000 psi (4136 bar)



## Tool accessories



We use high-grade austenitic stainless steel-highly suitable for hydrogen use



# Smart Flow Control



PRODUCT PORTFOLIO



**IOT 900**  
RELIEF VALVE



**IOT H-800 WLS**  
ACTUATED BALL VALVE



**IOT GATEWAY**



**IOT H-800 WLS**  
WIRELESS BALL VALVE



**IOT H-800 ETH**  
BALL VALVE



# Manifolds



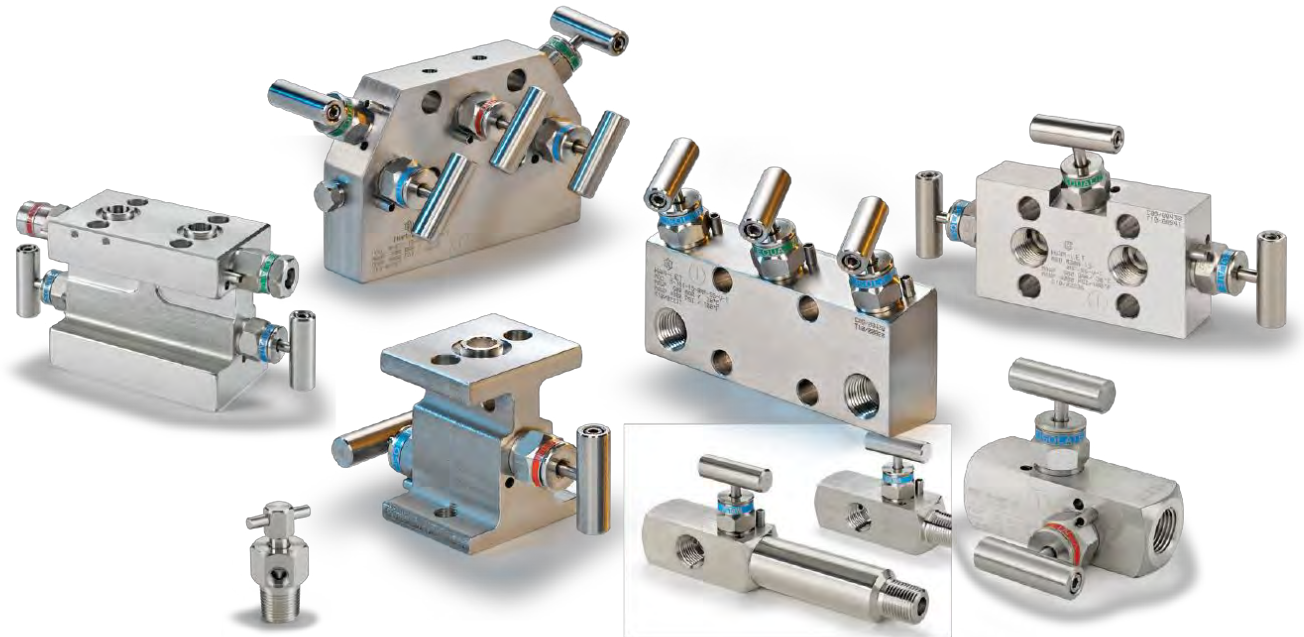
## MANIFOLDS INSTRUMENT ENCLOSURES

UCT Fluid Solutions offers a broad line of 1,2,3,4,5 instrument manifolds, all available in a wide range of materials that are fully compatible with the requirements of the Oil & Gas, Petro-Chemical and Chemical industries.

In addition to this standard range of products, UCT has over 3,500 different types of valves and manifolds available.

# 1|2|3|4|5

WAY MANIFOLDS





# Our Solutions in the world of Hydrogen

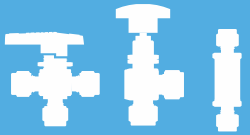


# Electrolysis



## LET-LOK FITTINGS

- Pattern – Union, Elbow, and Tee
- Size –  $\frac{3}{4}$ " and 1"



## PROCESS VALVES

- Series - H-700, H6800, H-300U
- Pattern – Straight and Angle
- Size range  $\frac{3}{4}$ ", and 1"





# Storage

Hydrogen Storage



**For 350 bar**

Let-Lok fittings | H6800 series



Hydrogen Gas Station



**Above 750 bar**

HHP C&T fittings | HHP Needle valves



Hydrogen Powered Vehicles



**Let-Lok and PIPELINE fittings**

With EC79 certification



# Refueling Station



## >350 bar

- Products – Tee, Elbow, Union, Cross, Adapters, Plug valve and check valve
- Connections – Compressor fittings and PIPELINE
- Size – the most common 3/8"

## >900 bar

- Products – Tee, Elbow, Union, Cross, Adapters, Nipples, DBB and Needle valve
- Connections –C&T
- Size – 1/4", 3/8", 9/16", 3/4" and 1"





# Supporting Industry Challenges

**SAFETY & RELIABILITY**

**REGULATORY REQUIREMENTS**

**HIGH PRESSURE GAS HANDLING**





# Challenge:

## Safety & Reliability

- Meet stringent validation and verification requirements
- Maintain lifecycle of consistent, stable performance
- Reduce reliability failures
- Reduce environmental footprint





# Solution: In-house Testing

- ✓ Helium leak test
- ✓ Make/ remake tests including interchangeability
- ✓ Thermal shock test
- ✓ Vibration test
- ✓ Hydraulic pressure and burst test



# Solution: ISO 15848-1 Certified



Our Ball valves, Needle valves, and Manifold series are certified to **ISO 15848-1**. Ensuring the lowest fugitive emissions rates and maximum safety for hydrogen handling.



**HIGH PERFORMANCE  
BALL VALVES H-6800**



**COMPACT ONE PIECE  
BALL VALVES H-800**



**THREE-PIECE  
BALL VALVES H-500**



**TWO-PIECE  
BALL VALVES H-700**



**INTEGRAL-BONNET  
NEEDLE VALVES  
H-300U**





# Solution: Ham-Let EF Series

## FUGITIVE EMISSIONS FREE SHUT-OFF VALVE

- ✓ Encapsulated design
- ✓ Reduces maintenance costs
- ✓ Eliminates hazardous releases
- ✓ ISO-15848 certified for low fugitive emissions



# Challenge: Regulatory Requirements

As a path forward to a hydrogen future, efforts are made to accommodate stringent global regulations

- Increase in industry demands, EC-79
- Optimize performance
- Reduce environmental footprints

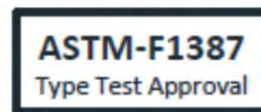




# Solution: Performance Commitment

High-performance solutions that meet international regulations for the hydrogen industry

- ✓ Tube and Pipe fittings are EC79 certified for onboard vehicles
- ✓ 100% Factory testing
- ✓ High-grade austenitic stainless steel-media compatibility and hydrogen embrittlement aspects
- ✓ Material traceability
- ✓ Certifications

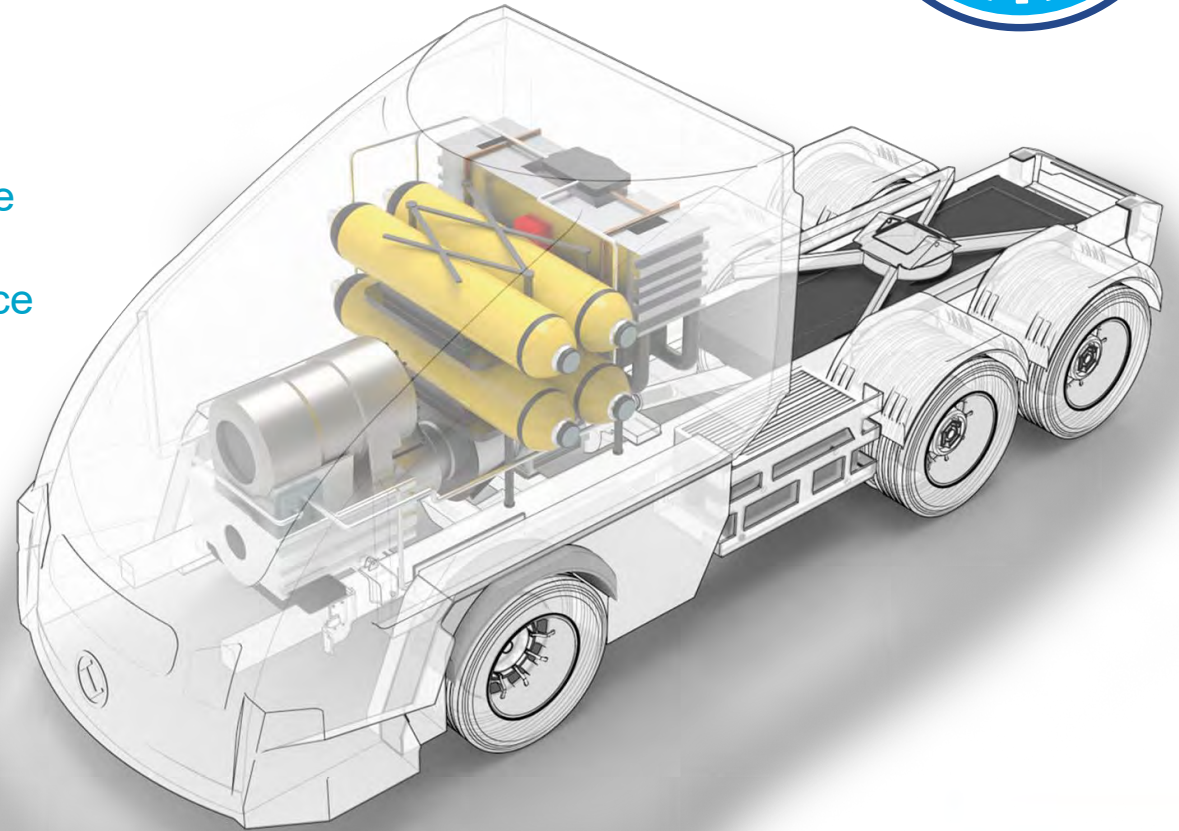


# Solution: EC-79 Certified

A major objective of the global trend to reduce carbon emissions is to commercialize hydrogen fuel cells for vehicles.

To ensure the safety of hydrogen powered mobility systems, European regulation EC-79 was enacted for components and systems intended for installation on hydrogen-powered vehicles.

- ✓ We offer dedicated tube and pipe fittings that are EC79 certified.
- ✓ Our products undergo rigorous tests to ensure hydrogen compatibility and corrosion resistance





## Challenge:

# High Pressure Gas Handling

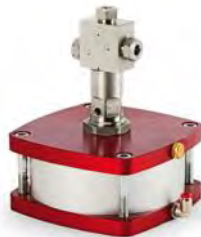
Hydrogen is an ultra-light gas that occupies a substantial volume under standard conditions of pressure. In order to store and transport hydrogen efficiently, this volume must be significantly reduced

- Increase hydrogen volume in a given space
- Reduce fueling time



# Solution: High Pressure Product Line

- ✓ Low maintenance
- ✓ High life cycle
- ✓ High durability
- ✓ High flow rate value
- ✓ Smooth operation and lower torque
- ✓ 100% factory tested
- ✓ Internal stem-lifting barrier prevents stem blowout



**HHP**





**UCT Fluid Solutions**  
**Geared to support your**  
**business!**

What's your  
next  
challenge?

- ✓ Global presence
- ✓ Quality you can trust
- ✓ One-stop-shop
- ✓ Leading by innovation
- ✓ Custom solutions
- ✓ Complete product portfolio





# Thank You

