

Hydrogen solution for material handling vehicles



BLUE
HYDROGEN
Clean energy solutions

How does it work?



1 Source of hydrogen

Delivered in bundles, tube trailers or pipelines.

2 Compression phase

Hydrogen is compressed at 50MPa.

3 Storage

Hydrogen is stored in pressure vessels known as buffers.

4 Dispenser

In just 3 minutes, hydrogen at 35MPa charges the forklift tank.

5 Control panel

It enables to control and monitor the hydrogen charging process.

6 Hydrogen fuel cell

It combines hydrogen with oxygen from the air to produce power. Electricity is generated via an electrochemical process. The output from the process includes electricity, water and heat.



Energy to go further

The world faces a dual challenge that involves both the environment and energy.

A world leader in gases, technologies and services for Industry and Health, Air Liquide seeks to facilitate access to this **clean energy**.

Hydrogen can be produced from a range of energy sources, in particular from **renewable energies**. For this reason, hydrogen shows great potential to provide clean energy and be an alternative to fossil fuels.

Air Liquide masters the entire industrial chain, **from production and storage to distribution and uses for the end user**.

The vehicles running on hydrogen emit **no greenhouse gases**, offer **productivity gains** and are **highly flexible**. Hydrogen offers users a source of power that is **reliable** and **environmentally friendly**.

These advantages have been highlighted in the North American market where more than 5,000 hydrogen-powered forklift trucks were deployed. The potential development of this market in **Europe** could be **around 10,000 units by 2020**.



Air Liquide has made a commitment to produce at least 50% of the hydrogen necessary to energy applications through carbon-free processes by 2020, by combining:

- ✓ biogas reforming,
- ✓ the use of renewable energies during water electrolysis,
- ✓ the use of technologies for the capture and upgrading of carbon emitted during the process of producing hydrogen from natural gas.

Contacts

Air Liquide

Advanced Business & Technologies

2, rue de Clémencière – BP 15

38360 Sassenage, France

Tél. : +33 (0)4 76 43 68 21

E-mail : fralab-clients@airliquide.com

www.energies.airliquide.com

www.airliquide.com



Air Liquide est le leader mondial des gaz, technologies et services pour l'industrie et la santé. Présent dans 80 pays avec environ 65 000 collaborateurs, le Groupe sert plus de 3 millions de clients et de patients.