Piel
by McPhy

DESIGNER AND MANUFACTURER
OF HYDROGEN AND OXYGEN
GAS GENERATORS
FOR LIGHT MANUFACTURING
In the framework of the energy transition, and as a leading supplier of hydrogen production and distribution equipment, McPhy contributes to the deployment of zero-carbon hydrogen throughout the world.

Thanks to its wide range of equipment and services dedicated to the industry, mobility and energy market, McPhy provides turnkey solutions to its clients adapted to their applications in industrial raw material supply, mobility solutions or renewable energy surplus storage and valorization.

As a designer, manufacturer and integrator of hydrogen equipment since 2008, McPhy has three development, engineering and production sites based in Europe (France, Italy, Germany).

McPhy Italia, a member of the McPhy Group, is a unique center specialized in the design, manufacturing and maintenance of a range of Piel and McLyzer electrolyzers. The company’s international subsidiaries ensure a global sales coverage of McPhy’s innovative hydrogen solutions.

McPhy Italia : IN SAN MINIATO, OUR CENTER OF EXPERTISE FOR ELECTROLYZERS

McPhy Italia, a member of the McPhy Group, is a unique center specialized in the design, manufacturing and maintenance of a wide range of electrolyzers. From machines for the precision industry of the Piel range, for which it is the exclusive designer and manufacturer, to McLyzer electrolyzers and to large multi-MW industrial platforms, our hydrogen production equipment covers a wide range of industrial applications.

As a result of over thirty years of experience in technical gases applied to metallurgy and welding for the manufacturing industry, our Piel hydrogen solutions have a proven track record and are recognized by more than 3,000 installations worldwide.

We design, manufacture and install hydrogen solutions that are adapted to your needs and requirements. Our vision is pragmatic: it’s about applying our experience and expertise toward your productivity, energy efficiency and economic performance.

An experienced team, specialized technicians and widespread assistance centers: McPhy offers a complete energy consultancy package to satisfy all customer requests through cost/benefit analysis – thus guaranteeing a significant economic return.

MORE THAN A MANUFACTURER
MCPHY SUPPLIES INDUSTRIAL COMPANIES WITH ZERO-CARBON HYDROGEN, RECONCILING PRODUCTIVITY, COMPETITIVENESS AND SOCIAL RESPONSIBILITY

Already used as feedstock in the industry for more than 100 years, hydrogen has since seen its development accelerated. By producing their zero-carbon hydrogen on site, using electrolysis from renewable electricity, industrial companies are entering a new low-carbon era.

Our Piel product line comes from decade-long experience in the goldsmithery sector, in precious metal treatment and in metallurgy, and covers a broad spectrum of applications from welding and brazing to the fashion industry.

Qualified and brand of choice for several industrial companies, our Piel hydrogen and oxygen generators are an ideal solution for light manufacturing. They integrate perfectly into industrial systems, whatever their size or business sector.

A PROVEN TRACK RECORD OF 3,000 INSTALLATIONS WORLDWIDE

Our customers are choosing to produce hydrogen that is: on-site, on-demand, and according to their specifications. They say farewell to the constraints of traditional storage systems (compressed gas cylinders: hydrogen, oxygen, acetylene, propane) and achieve better and verifiable results in terms of: Security of supply and energy independence (freedom from logistic constraints), Productivity, Cost control, Reliability and continuity of service, Dramatic reduction of their CO₂ footprint and air pollution, On-site production in the best conditions of quality and safety.

A PROVEN TRACK RECORD OF 3,000 INSTALLATIONS WORLDWIDE

With its hydrogen and oxygen generators, nitrogen generators, and its complete range of accessories and services, Piel covers a wide range of applications.

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FULL RANGE OF SMALL-SIZED HYDROGEN AND OXYGEN GAS GENERATORS

From 0.4 to 10 Nm³/h at 1 to 8 bar: our proven design solutions, whose reliability has made our product a worldwide success, are perfectly in line with the requirements of light industry.

All of our products are CE marked, in full compliance with European Union directives (low voltage, electromagnetic compatibility, pressure equipment directive)

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Pressure

<table>
<thead>
<tr>
<th>Series</th>
<th>Pressure (bar)</th>
<th>H₂ flow range (Nm³/h)</th>
<th>O₂ flow range (Nm³/h)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baby</td>
<td>1</td>
<td>0.4</td>
<td>0.2</td>
</tr>
<tr>
<td>P</td>
<td>1 to 2.5</td>
<td>1 to 1.6</td>
<td>0.3 to 0.8</td>
</tr>
<tr>
<td>M</td>
<td>2 to 2.5</td>
<td>2.4 to 4.4</td>
<td>1.2 to 2.2</td>
</tr>
<tr>
<td>H</td>
<td>4 to 6</td>
<td>2 to 10</td>
<td>1.8 to 9</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>6 to 18</td>
<td>13 to 26</td>
</tr>
</tbody>
</table>

Electrical power range at nominal rate (kW)

|          | 3             | 6 to 9                |
|          | 14 to 26      | 13 to 60              |

SOLUTION

AN IDEAL MANUFACTURING SOLUTION

Key Features of our PIEL Small-Sized Electrolyzers

- Alkaline electrolysis: the most mature and robust technology on the market.
- Fully integrated turnkey system.
- Remote supervision and maintenance.

Cost Control

- Low cost of the gases: approximately 5.5 kW/h are required to produce 1 Nm³ of gas – considerable savings.
- 20% savings on brazing allows for a higher working speed (+15-25%) for the specific characteristics of the hydrogen and oxygen.

With the PIEL New Generation: Welcome to Industry 4.0

The industry’s digital shift is a strategic move towards smarter, automated manufacturing processes that are more connected, more flexible and more efficient.

Thanks to the smart sensors integrated into the new Piel line, your pool of equipment is digitally connected, and our programmable logic controllers (PLC) collect, process and share real-time data, before, in a fully automated way, (re)defining your operating process towards increased productivity.

Our digital solution is environmentally friendly. It shortens your lead times and gives you more flexibility, drastically increasing the efficiency and profitability of your hydrogen system.

With our remote assistance module installed on your Piel generator/s, the sensors ensure real-time data collection and provide all the insights you need to help your operators increase their operational efficiency.

Thanks to its wireless connectivity, the Piel generator can: anywhere, anytime, and fully autonomously - transmit its data and self-analysis so that our teams can work quickly and remotely on a diagnosis, intervene on the programming or arrange for any on-site maintenance operations.

Our digital solution is environmentally friendly. It shortens your lead times and gives you more flexibility, drastically increasing the efficiency and profitability of your hydrogen system.
We invite you to discover our range of small-sized hydrogen and oxygen Piel gas generators, specifically designed for light manufacturing.

From 0.4 to 10 Nm³/h at 1 to 8 bar: we design, manufacture and install hydrogen solutions that cover a broad spectrum of applications from welding and brazing to the fashion industry or meteorology.

To find out more about the McPhy Group, visit our website mcphy.com

McPhy - a pioneer of hydrogen solutions in the service of the energy revolution - has made a name for itself among the world leaders in zero-carbon hydrogen production.

McPhy Italia
Via Ayrton Senna, 22
56028 San Miniato (PI) - ITALY
T. +39 0571 445811
piel@mcphy.com
Piel

by McPhy

PROGETTISTA E COSTRUTTORE
DI GENERATORI DI GAS SEPARATI IDROGENO E OSSIGENO
PER PRODUZIONE ON-DEMAND
PER L'INDUSTRIA LEGGERA
Nel quadro della transizione energetica e in quanto fornitore leader di apparecchiature per la produzione e la distribuzione dell'idrogeno, McPhy contribuisce alla diffusione dell'idrogeno a emissioni zero in tutto il mondo.

Grazie alla sua ampia gamma di attrezzature e serviziediattrezzature e servizi dedicati ai settori dell’industria, della mobilità e dell’energia, McPhy fornisce ai suoi clienti soluzioni chiave in mano adattate alle loro applicazioni nella fornitura di materie prime industriali, nelle soluzioni per la mobilità o nella stoccaggio e valorizzazione del surplus di energia rinnovabile.

Progettista, costruttore e integratore di apparecchiature a idrogeno fin dal 2008, McPhy ha tre centri di sviluppo, ingegnerizzazione e produzione in Europa (Francia, Italia, Germania).

McPhy Italia, che fa parte del Gruppo McPhy, è un centro unico specializzato nella progettazione, produzione e manutenzione di un’ampia gamma di elettrolizzatori Piel e McLyzer.

Le filiali internazionali dell’azienda assicurano un’ampia copertura commerciale per le innovative soluzioni di idrogeno di McPhy.

McPhy Italia: il nostro centro di competenza per elettrolizzatori di San Miniato

McPhy Italia, che fa parte del Gruppo McPhy, è un centro unico specializzato nella progettazione, produzione e manutenzione di un’ampia gamma di elettrolizzatori. Dalle macchine per l’industria di precisione della gamma Piel - di cui è l’esclusivo progettista e costruttore - agli elettrolizzatori McLyzer, passando dalle grandi piattaforme industriali multi MW, le nostre apparecchiature per la produzione di idrogeno coprono una vasta gamma di applicazioni industriali.

Risultato di oltre trent’anni di esperienza nei gas tecnici applicati alla metallurgia e alla saldatura per l’industria manifatturiera, le nostre soluzioni di idrogeno Piel e McLyzer vantano risultati comprovati e sono riconosciute da oltre 3.000 installazioni in tutto il mondo.

Progettiamo, costruiamo e installiamo soluzioni di idrogeno adattate ai tuoi bisogni e ai tuoi requisiti. La nostra visione è pragmatica: si tratta di applicare le nostre esperienze e competenze al servizio della tua produttività, della tua efficienza energetica e delle tue performance economiche.
MCPHY RIFORNEZI A LE AZIENDE INDUSTRIALI DI IDROGENO DECARBONIZZATO, CONCILIANDO PRODUTTIVITÀ, COMPETITIVITÀ E RESPONSABILITÀ SOCIALE

La nostra linea di prodotti Piel nasce da un’esperienza decennale nel settore dell’oreficeria, del trattamento dei metalli preziosi e della metallurgia, e copre un ampio spettro di applicazioni che vanno dalla saldatura e brasatura all’industria dell’alta moda.

I nostri generatori di idrogeno e di ossigeno Piel, marchio di riferimento per molte aziende industriali, sono la soluzione ideale per la produzione leggera. Si integrano perfettamente nei sistemi industriali, qualunque sia la loro dimensione o settore di attività.

RISULTATI COMPROVATI DA 3.000 INSTALLAZIONI IN TUTTO IL MONDO

I nostri clienti scelgono di produrre idrogeno e ossigeno sul posto, in base alle loro necessità e alle loro specifiche. Si liberano così dai vincoli dei tradizionali sistemi di stoccaggio (bombole di gas compresso: idrogeno, ossigeno, acetilene, propano) ottenendo risultati migliori e verificabili in termini di:

- Sicurezza dell’approvvigionamento e indipendenza energetica (liberta da vincoli logistici),
- Produttività,
- Controllo sui costi,
- Affidabilità e continuità del servizio,
- Drastica riduzione dell’impronta di CO2 e dell’inquinamento atmosferico,
- Produzione in loco nelle migliori condizioni di qualità e sicurezza.

I generatori Piel producono idrogeno e ossigeno, rilasciati separatamente dalle celle elettrolitiche, attraverso l’elettrolisi di acqua demineralizzata. I gas vengono quindi raffreddati, depurati e resi disponibili per l’uso alle due rispettive valvole di uscita.

COME FUNZiona?

L’elettrolisi alcalina, chiamata anche elettrolisi, è un processo utilizzato per produrre idrogeno dall’elettricità e dall’acqua attraverso una reazione elettrochimica:

2H2O + Energia = 2H2 + O2

Acqua + Elettricità → Idrogeno + Ossigeno

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TUTTI I SETTORI INDUSTRIALI POSSONO UTILIZZARE I NOSTRI PRODOTTI

Gioielleria, oreficeria e argenteria.

Industria del vetro.

Strumenti ottici: la saldatura a induzione utilizzata per gli strumenti ottici può essere effettuata proteggendo la zona di saldatura con atmosfera inerte costituita da una miscela con idrogeno. In questo modo si evita l’uso di disossidanti liquidi e il successivo decapaggio.

Meteorologia: l’idrogeno prodotto sul posto viene utilizzato per riempire i palloni-sonda per gli istituti meteorologici.

Industria elettronica.

Industria agroalimentare.

Trattamento dei metalli:

- Saldatura e brasatura

Saldatura e brasatura di accessori e servizi, la gamma Piel è adatta ad un’ampia serie di applicazioni.

Con i suoi generatori di idrogeno e ossigeno, i generatori di azoto e la gamma completa di accessori e servizi, la gamma Piel è adatta ad un’ampia serie di applicazioni.

- Laborazione del vetro (riscaldamento, fusione e operazioni di taglio)

Fiamme ad alta precisione e calore ridotto, che consentono di ottenere al minimo l’area riscaldata dei pezzi per ottenere una lavorazione sorprendentemente precisa.

- Saldatura e brasatura

Saldatura a punta ad alta pressione e saldatura pulita.

- Laborazione dei metalli

Torna alimentata a idrogeno ossigeno, una soluzione molto flessibile (regolazione della fiamma, disossidazione, ecc.), libera dai vincoli del gas in bombole.

- Trattamento termico

Sicurezza estrema e n’esigenze, perfettamente adattata a un forno per il trattamento termico.

- Taglio

Taglio di metalli ad alta pressione. Grazie all’elettrolisi purezza dell’ossigeno (99,9%), la lavorazione con idrogeno e ossigeno è eseguita in modo che non esista bagno di idrogeno nell’area da lavorare.

- Produzione in loco nelle migliori condizioni di qualità e sicurezza.
Da 0.4 a 10 Nm³/h, da 1 a 8 bar: le nostre comprovate soluzioni di progettazione, la cui affidabilità ha reso il nostro prodotto un successo mondiale, sono perfettamente in linea con i requisiti dell’industria leggera.

Tutti i nostri prodotti hanno il marchio CE, nel pieno rispetto delle direttive dell’Unione europea.

PUNTI CHIAVE DEGLI ELETTROLIZZATORI PIEL, DI PICCOLE DIMENSIONI

- Elettrolisi alcalina: la tecnologia più collaudata e affidabile sul mercato.
- Sistema chiuso in mano completamente integrato.
- Supervisione e manutenzione a distanza.
- Nuove coordinate in atmosfera.
- Basso costo dei gas
- Energia a zero emissioni di carbonio:
- Elettrolisi alcalina:
- Sistema di raffreddamento/pre-raffreddamento
- Demineralizzazione
- Monitoraggio e controllo
- Controllo ottimizzato
- Design ultra moderno.
- Protezione contro sovratensione
- Ampolla anti spasmi
- Senso termico
- Opzione di personalizzazione

Energia a zero emissioni di carbonio: la combustione dell'idrogeno con l'ossigeno non genera prodotti residui. Totale assenza di inquinamento da fuoco. Gli operatori non hanno bisogno di ingombranti respiratori e non è necessario installare sistemi di purificazione di grandi dimensioni.

La generazione separata del gas offre la possibilità di regolare la fiamma neutra, ossidante, riducente, oltre all’opzione di poter utilizzare l'idrogeno e l’ossigeno separatamente.

Comodità d’uso/Unità autonome: possono essere trasportate ovunque per la produzione di idrogeno e ossigeno. Con le sue quattro ruote pivottanti, la macchina è facile da spostare a seconda delle proprie esigenze.

Sicurezza: il gas viene prodotto nell’effettivo punto di utilizzo e non c’è volume di gas compresso. Le apparecchiature Piel non richiedono nessuna autorizzazione da parte delle autorità sanitarie o dei vigili del fuoco.

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Nuova gamma di potenza con comprovati nominali (kW):

- Baby
- P
- M
- H

- Presione (barg)
- Intervallo di portata H (Nm³/h)
- Intervallo di portata O (Nm³/h)
- Gamma di potenza elettrica alle condizioni nominali (kW)

Risparmio notevole. 5,5 kWh per produrre 1 Nm³ di gas - un 20% di risparmio sulla brasatura consente di migliorare la velocità del processo. Il 20% di risparmio sulle brasature consente di migliorare la velocità del processo. Il 20% di risparmio sulle brasature consente di migliorare la velocità del processo.

BENVENUTI NELL’ERA DELL’INDUSTRIA 4.0 CON LA NUOVA GENERAZIONE PIEL

La digitalizzazione dell’industria è un cambiamento strategico verso processi produttivi più intelligenti e automatizzati, più connessi, flessibili ed efficienti. Grazie ai sensori intelligenti integrati nella nuova linea Piel, le sue apparecchiature sono connessi digitalmente e i nostri Programmable logic controllers (PLC) raccolgono, elaborano e condividono i dati in tempo reale, in maniera completa e integrata. Grazie a una soluzione digitale che consente una maggiore produttività.

Il modulo di assistenza remota può essere installato sul/i generatore/i Piel. I sensori assicurano la raccolta dei dati in tempo reale e forniscono tutte le informazioni utili per aiutare gli operatori ad incrementare e affidabilità operativa. Grazie alla connettività, il generatore Piel può essere in qualsiasi momento, ovunque e in piena autonomia - trasmettere i dati e l’autoanalisi, cosicché i nostri team possano lavorare rapidamente e in ritardo sulla programmazione o organizzare eventuali interventi di manutenzione sul posto.

La nostra soluzione digitale è ecologica, riduce i tempi di consegna e offre più flessibilità, aumentando nettamente l’efficienza e la rilettura dei dati del sistema di idrogeno.
Ti invitiamo a scoprire la nostra gamma di generatori di gas idrogeno e ossigeno Piel di piccole dimensioni, appositamente progettati per la produzione leggera.

Da 0,4 a 10 Nm³/h, da 1 a 8 bar: progettiamo, costruiamo e installiamo soluzioni di idrogeno che coprono un ampio spettro di applicazioni che vanno dalla saldatura e brasatura all’industria della moda o alla meteorologia.

Per saperne di più sul Gruppo McPhy, visita il nostro sito

mcphy.com

McPhy Italia
Via Ayrton Senna, 22
56028 San Miniato (PI)
T. +39 0571 445811
piel@mcphy.com
2019 was a pivotal year for hydrogen in the fight against climate change. The industry’s global growth has reached a peak, confirmed by the incorporation of zero-carbon hydrogen in an increasing number of government roadmaps, the development of international coalitions and the realization of the first large-scale projects.

It was also a year of major change for McPhy, with the business successfully passing key technological and commercial milestones for preparing the future. Our strategy centers on helping our customers in the industry, mobility and energy sectors to successfully transition to business models based on zero-carbon hydrogen, reconciling economic performance and corporate social responsibility.

The reinforcement of our teams and their fields of expertise, our commitment to ongoing innovation and the increasing industrialization of our manufacturing processes enabled us to consolidate our position as a key technological and industrial partner for the hydrogen market and to be chosen to equip projects heralding the arrival of wide-scale change in the industry.

We are confident that the combination of rigor, agility, innovation and massification found in our markets will enable us to accelerate the roll out of competitive, high-performance zero-carbon hydrogen ecosystems with unlimited opportunities.

Our ambition for the future is clear: to continue our large-scale transition and increase the attractiveness and competitiveness of zero-carbon hydrogen by continually improving our equipment’s performance, with the highest standards of quality and safety, all within a strategy of hydrogen cost reduction.

We’re ready for the "Unlimited Hydrogen" era. Are you?

Laurent CARME
Chief Executive Officer of McPhy

A pioneer of hydrogen solutions in the service of the energy revolution, in ten years McPhy has positioned itself among the world leaders in zero-carbon hydrogen.

Our projects, the trust placed in us by key economic players, and our ongoing policy of innovation coupled with a solid industrial infrastructure allow us to design, manufacture and integrate effective and competitive hydrogen production and distribution equipment, in order to decarbonize the industry, mobility and energy sectors.
AUGMENTED McLyzer: NEW GENERATION ALKALINE ELECTROLYSIS FOR 20 TO +100 MW ARCHITECTURES

A true breakthrough technology, our “Augmented McLyzer” electrolyzers combine the reliability and the maturity of alkaline technology with great flexibility. They integrate new generation electrodes with high current density (doubled compared to standard electrodes) that significantly increase the performance of our equipments, all within a compact design. Based on a 4MW module design, our systems are created to scale up with your operating rhythm.

“Bigger scale, lower costs”: the scaling up and industrialization of electrolyzers will make it possible to bring about a drastic reduction in the purchasing costs and the democratization of hydrogen.

CLEAN INDUSTRY REVOLUTION

WIDELY USED FOR ITS FLEXIBILITY, MULTISECTORAL APPLICATIONS AND ITS ENERGY EFFICIENCY, HYDROGEN IS A COMPETITIVE AND ATTRACTIVE STRATEGIC TECHNOLOGY FOR INDUSTRICOMPANIES. BY REPLACING EXISTING CARBONIZED ENERGIES WITH CLEAN HYDROGEN, PRODUCED BY ELECTROLYSIS FROM RENEWABLE SOURCES, INDUSTRIALISTS ARE ENTERING A NEW LOW-CARBON ERA.

Low carbon, responsible, innovative and profitable: WELCOME TO THE INDUSTRY OF THE FUTURE

Already used in industry for more than 100 years, hydrogen has seen its development accelerated. On a world scale, industrial chemical and refining applications consume 60 million tons of hydrogen per year.

Almost all of this volume is produced using fossil fuels, based on a production process which is generally accepted to emit ten kilos of CO₂ per kilo of hydrogen produced.

By producing their zero-carbon hydrogen on site, using electrolysis from green electricity, manufacturers ensure their:

- Security of supply and energy independence (freedom from logistic constraints),
- Control over their costs,
- Reliability and continuity of service,
- Drastic reduction of their CO₂ footprint and air pollution,
- On-site production in the best conditions of quality and safety,
- Creation of new business models.

Qualified and selected by numerous industrialists and/or gas companies, our electrolyzers integrate perfectly into industrial systems, whatever their size or business sector.

AUGMENTED McLyzer: NEW GENERATION ALKALINE ELECTROLYSIS FOR 20 TO +100 MW ARCHITECTURES

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Clean Mobility Revolution

Hydrogen Establishes itself as a Zero-Emission Alternative Fuel that can Significantly Reduce Air Pollution in the Transport Sector by Eliminating the Emission of Pollutants and $\text{CO}_2$.

McPhy’s Clean Hydrogen Production and Distribution Solutions for Zero-Emission Mobility

Ensure high-quality service, all while contributing to improve air quality and public health.

With their great autonomy and fast refueling, hydrogen vehicles are attracting a growing number of communities, manufacturers or managers of automobile fleets and plants or logistic platform operators. They find the perfect union of operating convenience, continuity of service and participation in the fight against air pollution.

All types of mobility are concerned:
- Land: utility vehicles, passenger cars, buses, big rig trucks, lift trucks,
- Railway: trains,
- Maritime: river shuttles, boats.

Towards “Zero Emissions” Heavy Transportation

Hydrogen is the only scalable technology capable of meeting the massive needs of heavy-duty transportation, which amount to hundreds or even thousands of kilograms of hydrogen each day:
- A zero-carbon hydrogen, produced on site by alkaline electrolysis, cost-competitive with carbonated hydrogen (SMR),
- A clean alternative fuel, whose price at the pump is competitive with diesel,
- “Bigger scale, lower costs”: the scaling up and industrialization of hydrogen stations will make it possible to bring about a drastic reduction in the purchasing costs and the democratization of hydrogen mobility.

Augmented McFilling: A New Generation of Hydrogen Station for Heavy-Duty Transport

A true combination of technological and digital innovation, Augmented McFilling by McPhy is a unique and proprietary design philosophy that supports the heavy-duty transport sector’s transition towards the large-scale use of low-carbon hydrogen. Combining the best of alkaline electrolysis and hydrogen station technologies, Augmented McFilling is an intelligent system capable of being dynamically reconfigured to offer you multiple modes of operation that will optimize our customer’s TCO (Total Cost of Ownership) in real time.

Augmented McFilling is a wide range of small, medium and large capacity stations 350 and/or 700 bar

Augmented McFilling: as of 2 tons per day, a modular solution with no limits in terms of capacity

Interfaces with an electrolyzer for true clean-mobility chain

Zero-emission mobility: zero particles, zero $\text{CO}_2$, zero noise

Compact and modular

Embedded supervisory software makes our Augmented McFilling station dynamically reconfigurable. The station autonomously designs its optimal operating scheme and reconfigures the flows from production to distribution to the vehicle, via compression and storage steps to deliver hydrogen at the lowest cost while ensuring service continuity and maximum availability.
**EnergieDienst**: 1 MW of electrolysis in Germany

**CLEAN ENERGY REVOLUTION**

Increasing the share of renewables in the energy mix

Solar, wind, hydraulic: energy transition depends on renewable energies. They can answer the growing needs for energy, all while:

- Preserving the natural resources of our planet
- Providing autonomous energy for the territories
- Improving air quality
- Reducing CO₂, particle and greenhouse emissions
- Promoting economic growth thanks to the production of decentralized energy
- Fighting against climate change

In the face of the massive deployment of renewable energies, by nature intermittent and difficult to predict, hydrogen seems to be a flexible and competitive solution.

- Flexibility and balance for the network: compensate for the intermittence of renewable energies,
- Matching supply and demand thanks to hydrogen storage,
- Reliable energy reserve for isolated or off-grid locations and a backup solution and/or autonomous energy (buildings, telecom antennas, data centers, …).

**HYDROGEN, AN AGILE ENERGY**

The McLyzer range is positioned as the ideal tool to stabilize the electric grids confronted by a growing influx of renewable electricity and participates in the primary and secondary reserves.

Its dynamic response to power fluctuations and its durability have long been demonstrated through data collected since 2014 on the “H₂Ber” Power to Gas project in Berlin.

Designed by McPhy to limit their operating impact on the environment, these hydrogen generators combine a zero-loss purification unit with a closed-loop system to reduce the consumption of water to the strict minimum during its transformation into hydrogen.

**MCPHY ELECTROLYZERS: A DEMONSTRATED DYNAMIC RESPONSE**

- Flexibility and balance for the network: compensate for the intermittence of renewable energies,
- Matching supply and demand thanks to hydrogen storage,
- Reliable energy reserve for isolated or off-grid locations and a backup solution and/or autonomous energy (buildings, telecom antennas, data centers, …).

**FOCUS ON POWER TO GAS**

A true “bridge” between the electric and gas grids, Power to Gas brings flexibility and can increase the clean energy share, all while managing investments:

- Using existing grid infrastructures
- Coupling with other industrial or mobility applications

This solution has been widely adopted by large companies around the world.
AUGMENTED HYDROGEN SOLUTIONS

TO STRENGTHEN THE ATTRACTION AND PROFITABILITY OF CLEAN HYDROGEN, MCPHY RELIES ON ITS CAPACITY FOR INNOVATION, BACKED BY A PREMIER INDUSTRIAL INFRASTRUCTURE.

RESEARCH & INNOVATION
In one decade, McPhy has acquired a solid expertise in hydrogen technologies for the reduction of carbon footprints in the industry, mobility and energy sectors. Combined with a policy of ongoing research and innovation, this allows it to work on continually improving its equipment - to achieve the highest standards of performance, quality and safety.

DESIGN & ENGINEERING
McPhy applies its strengths in technological and scientific leadership to designing scalable architectures for the production and distribution of zero-carbon hydrogen, ready for the massification of the sector. All this based on a standardisation approach which meets both the needs and the techno-economic demands of markets.

MANUFACTURING & COMMISSIONING
McPhy’s market reach and that of its services is worldwide, coupled with a solid industrial infrastructure, designed to scale-up in line with the markets. McPhy has five centers of excellence in Europe:

- France: one engineering site, an innovation platform, test bench and industrial manufacturing site dedicated to our hydrogen stations (ISO 9001), and a business unit in Paris.
- Germany: engineering for multi-MW electrolysis systems.
- Italy: a large industrial site certified ISO 9001 and dedicated to the assembly of PRF electrolyzers and the production of our large capacity stacks (multi MW).

For the installation and commissioning stages, McPhy has created a Services team, supported by a first class international partnership network.

CUSTOMER SATISFACTION
Our strategy centers on helping our customers in the industry, mobility and energy sectors to successfully transition to business models based on zero-carbon hydrogen. We design hydrogen systems based on real-world conditions and which are scalable for the future, reconciling the demands for both economic performance and social responsibility.

BREAKTHROUGH TECHNOLOGIES
MODULARIZED & SCALABLE SYSTEMS

MANUFACTURING CAPACITIES
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ELECTROLYZERS
Piel 0.4 to 12 Nm³/h (1 to 8 bar)
McLyzer 20 to 80 Nm³/h (30 bar)
Augmented McLyzer Multi-MW, GW designs

STATIONS
Starter Kit McFilling 20 kg (350 bar)
McFilling 500 350 bar: 100 to 500 kg per day
700 bar: 100 to 600 kg per day
Dual Pressure 350/700 bar: 100 to 800 kg per day

ELECTROLYZERS STATIONS SERVICES
Supervision and remote control, preventive maintenance, training of your teams, etc.

AN INTEGRATED APPROACH TO RESPOND TO YOUR LARGE-SCALE APPLICATION NEEDS

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FACED WITH ENVIRONMENTAL, ECONOMIC AND SOCIETAL CHALLENGES, A NEW ENERGY MODEL IS EMERGING, ROOTED IN THE TERRITORIES, AND BASED ON NON-CARBON EMITTING ENERGIES.

Used as a feedstock in industrial processes, converted into clean fuel for zero-emission vehicles, or used to facilitate storage and flexibility for electricity and gas networks:
zero-carbon hydrogen - produced by electrolysis using renewable electricity - plays a central role, and contributes to the decarbonization of all sections of the economy and the emergence of a societal model that is more carbon neutral.