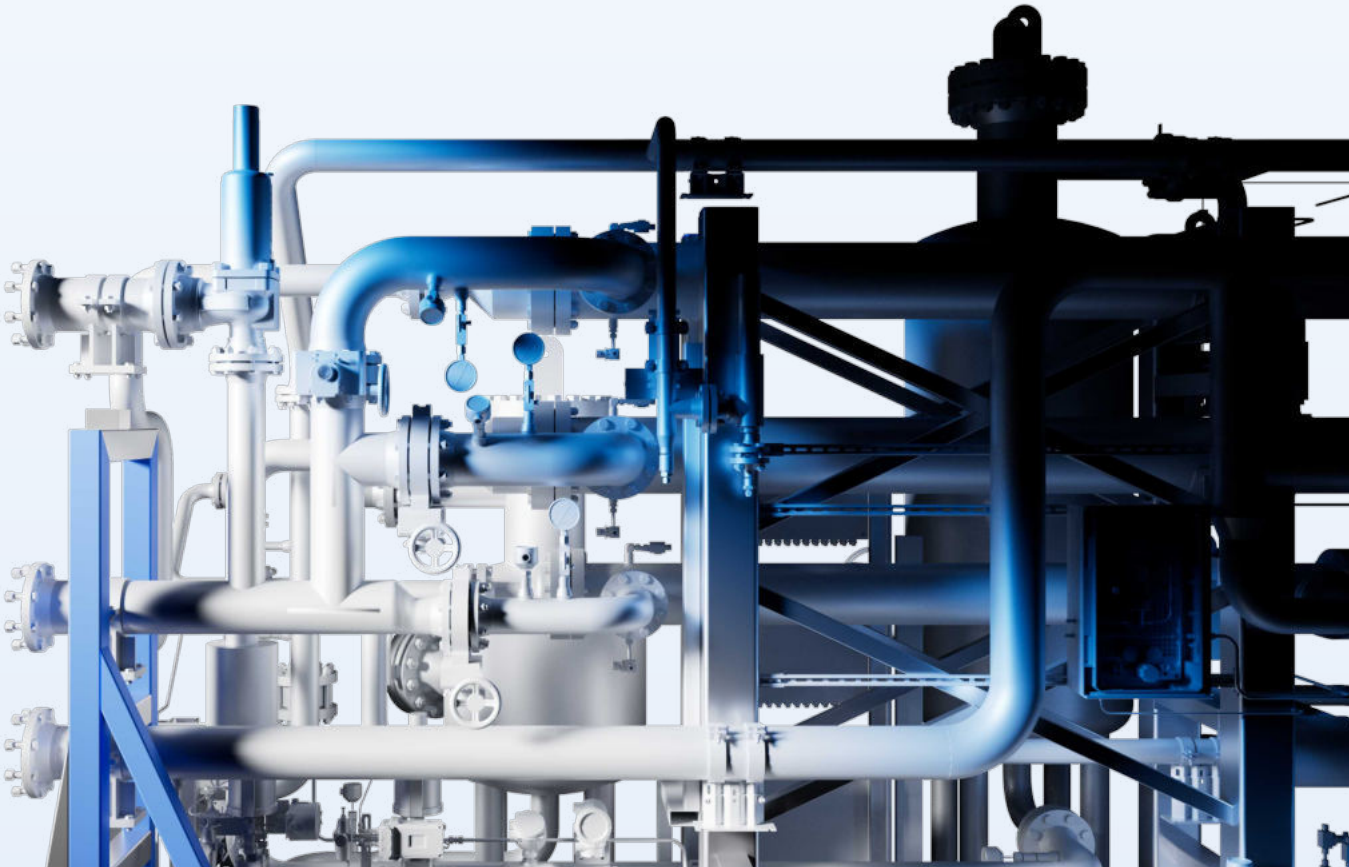
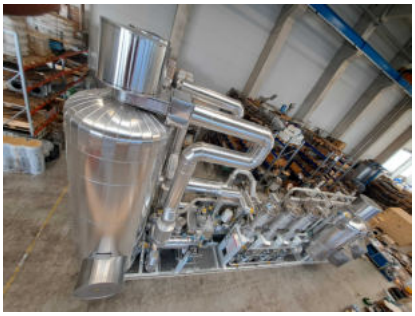
REICAT

Efficient hydrogen purification for Power-to-X

We make your hydrogen usable.
Our state-of-the-art DeOxo Dryers produce high-purity H_2 at quality 5.0 (>99.999%) and higher.



Leading companies rely on ReiCat – worldwide

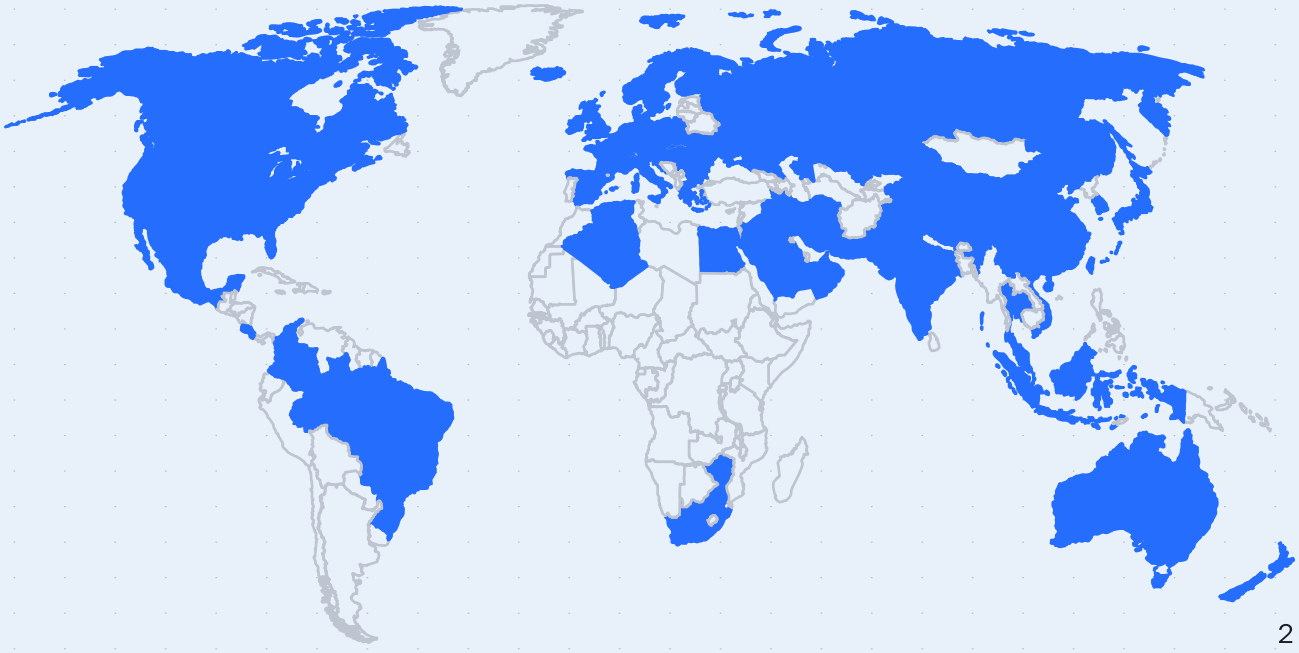


We are proud to count leading global corporations among our regular customers. Over 620 ReiCat systems operate in 61 countries worldwide.









We have 60+ H_2 treatment units in operation

Selected references with world-class petrochemical and energy customers

Industry	Application	Flow rate Nm³/h	Pressure bar(g)	Country of installation
Energy	Power-to-X	60,000	91.5	Germany
Energy	Power-to-X	21,574	40	Germany
Energy	Power-to-X	10,506	48	Denmark
Energy	Power-to-X	3,000	35	Denmark
Energy	Power-to-X	1,830	36	Germany
Technical gas production	Chlor-alkali-electrolysis	16,593	25	Belgium
Technical gas production	Chlor-alkali-electrolysis	3,500	300	Asia
Technical gas production	Electrolysis / cylinder filling	500	250	Germany
Chemistry	Chlor-alkali-electrolysis	15,000	20	Germany
Chemistry	Chlor-alkali-electrolysis	10,000	20	Germany
Chemistry	Fine chemical production	confidential	4	USA & Spain
Metal & automotive	Tungsten powder production	10,000	0.5	confidential

40+ years in hydrogen treatment. 10+ years of PtX experience.

This proven track record helps us minimize performance risks and reliably deliver to agreed specifications.



Selected ReiCat case studies of recent projects





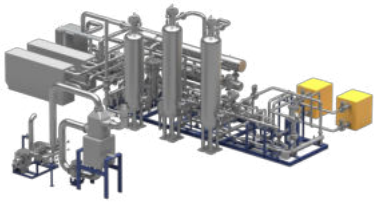
Customer:	European Energy
Product:	DeOxo and DeOxo Dryer
Electrolyzer:	Siemens Energy Elyzer P-300
Size:	52 MW & 15 MW
Location:	Kassø & Esbjerg, Denmark
Project:	ReiCat delivered two H_2 purification units to European Energy, one of them for Kassø, home to the world's largest e-methanol facility. Methanol end-customers include Maersk, LEGO, Novo Nordisk, Shell, and OMV.



Customer:	Major EPC company
Product:	DeOxo Dryer
Electrolyzer:	confidential
Size:	100 MW
Location:	Germany
Project:	ReiCat has recently delivered a hydrogen purification system for one of Europe's lighthouse PtX projects. Green hydrogen is purified before being fed into a pipeline to be transported to a refinery.

Selected ReiCat case studies of recent projects





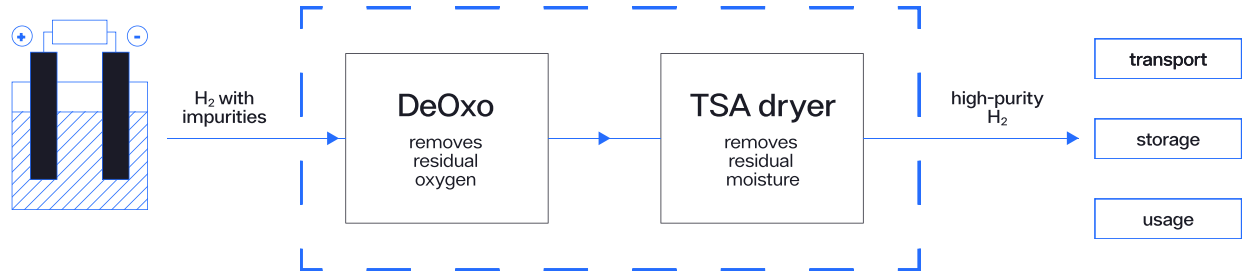
Customer:	EWE
Product:	DeOxo Dryer
Electrolyzer:	Siemens Energy
Size:	320 MW
Location:	Emden, Germany
Project:	ReiCat is supplying a hydrogen purification system for EWE's 320-megawatt electrolyzer in Emden. The hydrogen production plant is the core element of the multi-part flagship project Clean Hydrogen Coastline.



Customer:	Symrise
Product:	Hydrogen recycling
Integration:	Fine chemical production system
Location:	USA & Spain
H_2 recovery rate:	98 %
Project:	Following the successful delivery of a hydrogen recycling system to the USA, ReiCat supplied a second unit to Spain. The ReiCat system recovers up to 98 % of hydrogen from the production process, resulting in CO_2 savings of 6,263 tonnes per annum.

ReiCat's state-of-the-art DeOxo Dryers

We combine DeOxo catalysts and TSA dryers to purify hydrogen to 5.0 or 6.0 quality



Scope of supply: turnkey skid-mounted solution, including:

DeOxo unit: catalytic reactor, chiller, demister for condensate separation; optional pre-demister + heater to prevent water formation in the reactor

TSA dryer: 2x drying vessels, chiller, demister, filter; for regeneration: heater, optional blower

All interconnecting piping and instrumentation within the skid

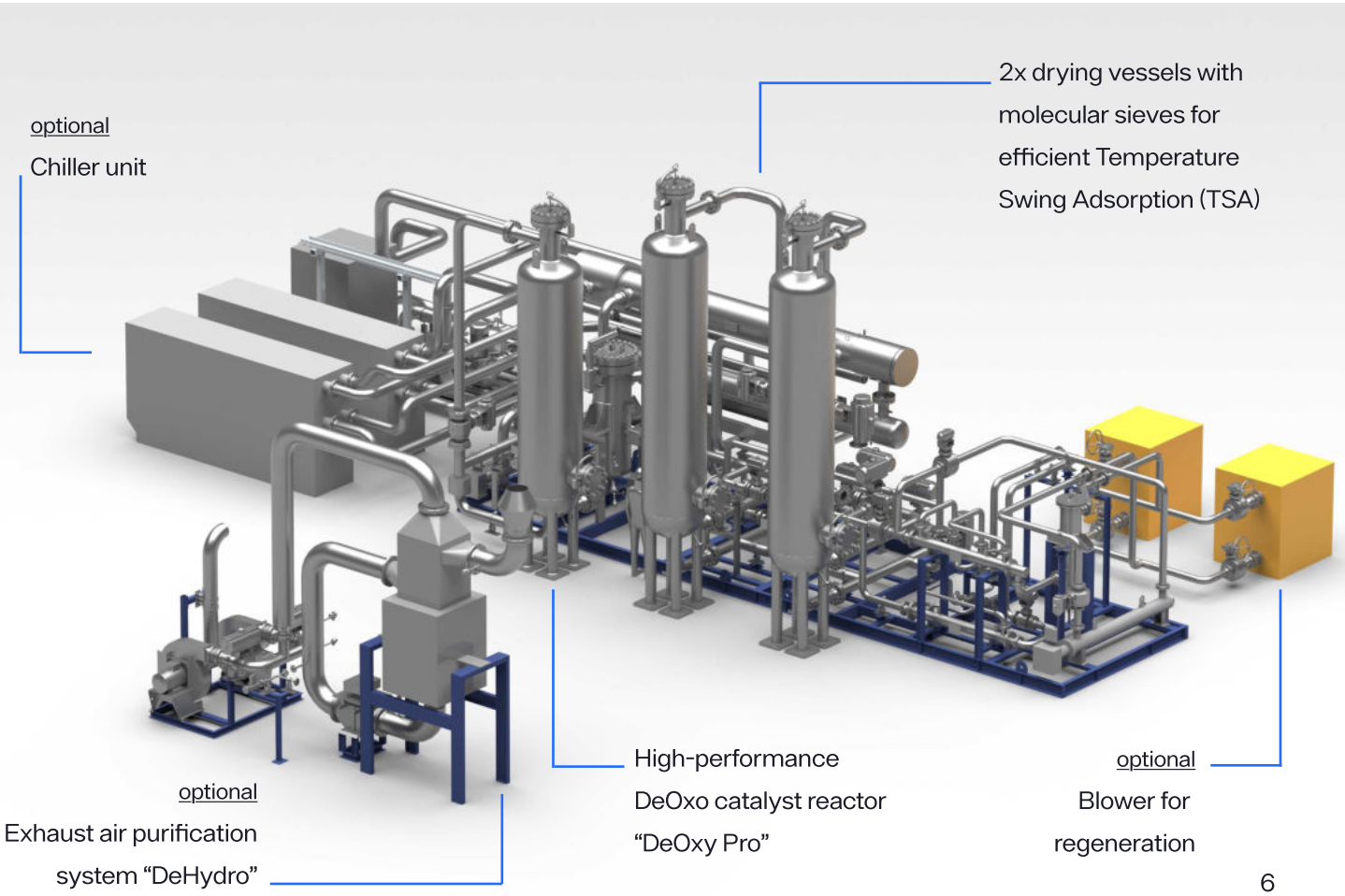
Control system

Analysis units for H_2O and O_2 plus "HO Meter"

HAZOP study, FAT, SAT, documentation

Optional exhaust air purification system "DeHydro" - see p. 7

Optional external chiller



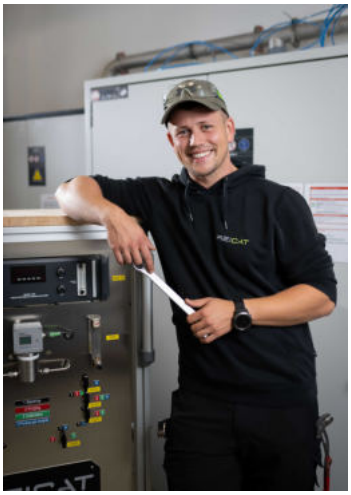
Successful projects start with the right team

Our project teams combine decades of experience with interdisciplinary thinking, engineering excellence, and a shared passion for delivering solutions that perform.

Let’s talk about your next hydrogen project!









Performance across every scale

Hydrogen purification engineered for flexibility, efficiency, and safety

Capacity

200–30,000 Nm^3/h per unit
(= 1–150 MW electrolyzer capacity)

Stacked from 30,000 Nm^3/h onwards

Plant availability

Up to 99 % availability
with the ReiCat Redundancy Concept

Energy consumption

6–10 Wh per Nm^3

Operating pressure

0.5–400 bar

Compatibility

Compatible with all major electrolyzer technologies, e.g. PEM, alkaline, SOEC, AEM

Realized projects with Siemens Energy, Sunfire, thyssenkrupp nucera and more

Quality & safety

ISO 9001 certified processes

Multiple safety features such as the ReiCat HO meter that prevents the formation of explosive gas mixtures

We build according to all major engineering standards

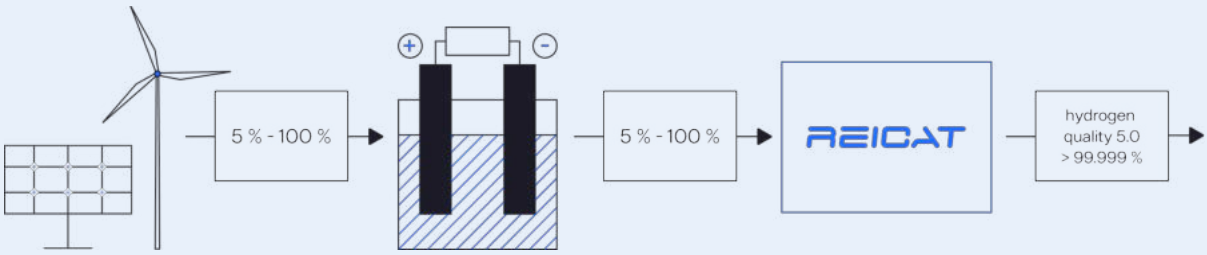
Proven technology tailored to your needs

Optional add-ons for maximum performance

Our modular system can be customized to your specifications

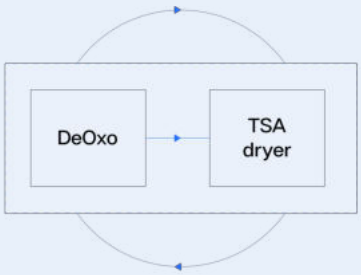
HighFlex H_2® Technology

Dynamic operation from 5–100 % of nominal hydrogen flow



Closed Loop Technology

Removes impurities with minimal to zero losses



Our four design standards are tailored to different setups

Internal blower

- minimal losses & high energy efficiency
- can operate in start-stop mode
- independent regeneration from gas flow
- popular among PtX customers

Booster / compressor

- zero losses
- suitable when a compressor is already present in your system

Regulator

- zero losses
- low maintenance
- minimum pressure losses

Suction side on-site compressor

- zero losses & highest energy-efficiency
- low maintenance
- can achieve H_2 quality of 6.0
- suitable when a compressor is already present in your system

DeHydro

A smart and safe way to vent hydrogen



A catalytic system that prevents flammable hydrogen from being released into the atmosphere.

It employs catalytic oxidation in which hydrogen reacts with oxygen over a catalyst bed, converting H_2 into water vapor (H_2O) without combustion or flame formation.

The system operates using ambient air and does not require a dedicated oxygen supply.

Key benefits of ReiCat's H_2 purification solution

ReiCat's DeOxo Dryers	Conventional DeOxo Dryers
High-performance DeOxo catalyst Proprietary, field-proven high-performance DeOxo catalyst backed by 40+ years of DeOxo experience. "DeOxy Pro" offers KOH tolerance for alkaline electrolysis of up to 10 mg/Nm^3.	Standard catalyst from a supplier with limited tolerance to catalyst poisons and lower performance.
Low-maintenance molecular sieve Specialized molecular sieve with a service life of 10 years, aligned with statutory pressure vessel inspection intervals.	Desiccants such as silica gel or alumina gel typically require replacement after approximately 2 years, resulting in higher downtime and maintenance costs.
Low OPEX Energy-efficient design with heat recovery and energy consumption of only 6–10 Wh/Nm^3.	Less energy-optimized designs with higher specific energy consumption.
High flexibility and minimal H_2 loss HighFlex H2® technology enables operation down to 5 % of nominal flow, while ReiCat Closed Loop TSA technology reduces H_2 losses to as little as 0 %.	Conventional purification systems typically operate down to 20 % of nominal flow, while standard TSA technology can result in H_2 losses of 3 % or more.
Outdoor-ready design Outdoor installation without additional housing.	Additional housing may be required.
Proven track record and production set-up 60+ hydrogen treatment systems delivered, 10+ years of PtX experience, and a production set-up refined over more than 40 years to ensure consistently high quality standards.	May have less experience in engineering and building hydrogen treatment systems, combined with newly established production facilities and less mature quality processes.

FAQ

Gas quality and technical specifications

1. **Which impurities can be removed from hydrogen from electrolysis?**

   The main impurities of H_2 from electrolysis are residual oxygen and moisture. In case of alkaline electrolysis there might also be traces of liquid alkaline. Oxygen, moisture and aerosols can be removed by standard ReiCat hydrogen purification units producing hydrogen of quality 5.0 / grade 99.999 %. Further impurities might be removed by enhancing our standard systems.

2. **Can you also purify to quality 6.0 / grade 99.9999 %?**

   Yes, under the condition that there are only oxygen and moisture as impurities and that the gas can be dried up to - 60 °C and at > 20 bar, our systems can purify hydrogen to grade 99.9999 %. This requires a bigger reactor and a bigger chiller.

3. **What are your inlet requirements regarding temperature and pressure?**

   Our systems are flexible in terms of temperature. The standard pressure range is 1 - 40 bar(g). However, a special ReiCat design allows pressures up 400 bar(g).

4. **Which Closed Loop design standard is best for my application?**

   The choice depends on your requirements and needs. See page 5 for details on each design.

Catalyst & process efficiency

5. **What are the standard adsorption and regeneration times of your systems?**

   8 h - 24 h adsorption cycles (depending on the size of the unit), 8 h regeneration.

6. **What are the standard H_2 losses in a system without ReiCat Closed Loop Technology?**

   A standard systems loses around 3 % of H_2. ReiCat Closed Loop Technology can reduce this to zero.

7. **What is the energy consumption of a standard system?**

   Approximately 6 - 10 Wh per Nm^3.

Scope of supply

8. **What is ReiCat's scope of supply?**

   Gas purification unit, packaging, transportation (upon request), supervision of commissioning & startup service, spare parts package, custom maintenance package (upon request).

9. **What is included in the budget offer of a standard system?**

   Engineering, all components within the skid incl. HighFlex H_2® and Closed Loop Technology (pressure vessels, piping, fittings, catalyst, molecular sieve), O_2 & H_2O analysis, design according to EN code, manufacturing.

FAQ

Scope of supply

10. **What is included in the commercial and technical quotation after basic engineering?**
    - Commercial quotation: unit price, price of requested add-ons and delivery time.
    - Technical quotation: basic PFD diagram, basic layout plan, utility requirements, utility consumption, basic overall diemensions, basic overall weight, scope of supply / list of materials, process description; in our “Basic Engineering Plus” package the following additional deliverables are included: preliminary P&ID, information about noise emissions, HAZOP on-site study, general arrangement drawing (incl. dimensions).

Engineering standards & delivery times

11. **Is construction according to ASME or other engineering standards/codes possible?**

    Yes, it is possible. We generally follow EN standards. Upon request we are happy to follow other engineering standards like ASME, China Stamp, etc. We have delivered systems for every common international standard in the past.

12. **What is the standard delivery time?**

    Delivery time highly depends on your specifications and our capacity at time of order.

Installation & setup

13. **Is outdoor installation possible?**

    Yes, outdoor installation is possible with accompanying heating and insulation elements.

14. **How long does installation and commissioning take?**

    This heavily depends on the system size and scope. For a system size of 15,000 Nm^3/h, commissioning and startup typically take around 2 – 3 weeks.

Why should I choose ReiCat?

- Experience matters! ReiCat builds on 40 years of experience in gas purification.
- More than 60 hydrogen treatment systems worldwide proof the longevity of our systems beyond the industry standard of 20 - 25 years.
- Our modular systems allows for tailored engineering according to your needs.
- Our systems are designed for highest energy efficiency to ensure lowest OPEX.
- Our proprietary Closed Loop Technology and HighFlex H_2® Technology guarantee minimum to zero H_2 loss and optimal adaptation to fluctuating volume flows in PtX systems.

Climate technology made in Europe since 1981

Efficient catalytic purification and recycling of technical gases and exhaust air

ReiCat has been developing advanced process engineering solutions since 1981.

Our patented technologies for the purification and recycling of technical gases, including hydrogen, oxygen, helium, argon, nitrogen, CO_2, CH_4, and noble gases, enable leading companies worldwide to advance green hydrogen, the circular economy, carbon capture, and other industrial applications.

As a leading provider of catalytic exhaust air purification systems, we also help coffee roasters worldwide meet stringent emission standards.



Headquarters in Germany

We engineer and build our systems in and around Gelnhausen, about 50 km from Frankfurt am Main, Germany.

Subsidiary in Italy

Since 2022, we have also been operating a subsidiary in Bologna, Italy.