Leading in biological wastewater and gas treatment

Over 30 years of experience in reducing your water and carbon footprint and reclaim of your valuable resources.

revitalizing resources

Revitalizing resources

'Let's embrace the challenges for a better future.'
- Founder Jos H.J. Pâques -

In a rapidly changing world, humanity is confronted with challenges like global warming, depletion of valuable resources and most threatening, water scarcity. Water is a bare necessity of life and essential in the production of food, goods and energy, for socio-economic development and for maintaining healthy ecosystems.

Organic pollution treated

7700 mln kg/year

Although 70% of the earth's surface consists of water, only 1% is fresh water and available for human consumption and use. A growing world population, a changing climate and higher standards of living only intensify the pressure on already scarce resources.

Therefore, integration of water purification, sustainable energy generation and reuse of resources is becoming more and more essential.

Ideas and Solutions

Over 30 years, Paques helps industries to reduce water and carbon footprints and reclaim valuable resources. Paques' anaerobic water purification systems produce energy (biogas) from wastewater, whilst purifying the water and facilitating water reuse.

Since the introduction of the first BIOPAQ® reactor in 1981, in close cooperation with partners a broad portfolio for integrated water and gas treatment was developed by Paques. All these solutions have proven to be cost-effective and highly reliable.

Leading companies from a variety of industries worldwide selected Paques as the partner for meeting their purification and sustainability needs. Paques established long-term relationships with customers by working closely together in developing solutions and delivering high-quality installations.

Proven quality

In more than 30 years, Dutch second-generation family owned business Paques has grown into one of the leading players in water and gas treatment. Today, Paques has offices and/or production facilities in the Netherlands, China, Brazil, Canada and India and a network of professional partners worldwide.

Integrated solutions

With an installed base of over 1800 references in more than 60 countries, Paques has proven to be a reliable partner in business. Solutions for water and gas treatment require an integrated approach. Paques' strength lies in devising solutions that meet even the most demanding customer requirements.

3300 mln m^3/year

produced biogas

Equals energy consumption of

2.3 mln

Dutch households

9200 mln kg/year

of CO^2 emission reduction

Paques helps industries to:

- meet safe water discharge requirements
- reduce water consumption
- reuse water
- produce green gas
- upgrade biogas
- recover valuable elements from waste/process water

Continuous innovation

With a high focus on innovation, Paques is constantly developing new treatment systems for new challenges. Over the past decades, the company has transferred many innovative ideas into successful client solutions. With dedicated R&D centers in the Netherlands and China, Paques will remain at the leading edge of water and gas treatment. The combination of know-how, experience, decisiveness and our multidisciplinary approach, guarantee accelerated implementation.

Solutions for all sectors

Many organisations, both industrial and governmental, are already aware of the preciousness of water. Therefore they clean their wastewater by using Paques' sustainable and innovative technologies and know-how. Since wastewater is also a source of energy, nutrients and base metals, the integrated solutions that Paques offers combine water reuse, energy production and reclamation of valuable resources. With Paques innovative solutions, industries decrease their water footprint while revitalizing resources.

Food processing company reduces groundwater intake

Belgian food processing company Pasfrost reduces the use of groundwater by 50% by mixing it with treated effluent in order to put less pressure on the local groundwater stock. By using anaerobic and aerobic technologies, combined with ultra-filtration followed by two-step reverse osmosis and UV-treatment, the water consumption is reduced to less than 2 m^3/ton of product. The cost for producing this revitalized effluent is significantly lower than the price of water from external sources.

Recovering phosphate

Utility company Waterstromen treats the wastewater of two Aviko potato-processing plants. PHOSPAQ™ technology is applied for recovery of phosphate as struvite. 500 tons per year of struvite can be used as fertiliser. For the removal of nitrogen, Waterstromen uses the ANAMMOX® technology. This removal technology does not need an extra carbon source and saves 1.5 GWh nett electric power each year.

Power for wine production

The wastewater of New Tianlong Wine Company in China is treated with a BIOPAQ® system and filtered by four ASTRASAND® continuous sand filters. 80% less fresh water intake is therefore possible and the produced biogas is for 25% used to power the entire WWT plant, leaving 75% available for the production line.

Further recycling for paper mills

Reduction of water consumption to < 5 m^3/ton of product causes process water contamination which interferes with paper quality and work environment. After treatment with a BIOPAQ® system, the process water is suitable for reuse. In addition, surplus starch and other additives are converted into biogas to power the paper mills saving up to 5% of overall energy requirement.

Sweet energy

Process water of sugar factories is perfectly suitable for the production of biogas. Royal Cosun installed two BIOPAQ®IC reactors that process 800 m^3 water per hour, resulting in maximum 20,000 Nm^3 methane daily (8.3 MW of primary energy). To compare: aerobic treatment of the process water would take an electric power of at least 1 MWe.

Biogas for breweries

With the BIOPAQ® technology wastewater from breweries is anaerobically treated before discharged. The desulphurised biogas can be mixed with natural gas to fire up steam boilers. Biogas from the BIOPAQ® can provide 15% of the energy required for a brewery production of 8 mln hectoliters annual.

Nutrient recovery/removal municipalities

By adopting the combination of BIOPAQ®, PHOSPAQ® and ANAMMOX® Technology, Severn Trent Water produces valuable products, under the form of struvite crystals and methane. Next to this resources recovery, they save up to 60% in power consumption to treat the load present in the dewatering and trade liquors. The Paques installations are compact and will not produce waste sludge.

Paques is sustainability partner of:

Pulp and Paper
- Saica
- Smurfit Kappa
- Georgia Pacific
- Nine Dragon Paper
- SCA Packaging
- Stora Enso
- UPM
- Artivinco Paper
- Cartonifício Valinhos

Beer and Beverages
- Anheuser-Busch InBev
- Carlsberg
- Cervejaria Petrópolis
- Coca Cola
- Harbin Brewery
- Heineken
- Khon Kaen Brewery
- PepsiCo
- SABMiller
- Zhujiang Brewery
- Ambev

Food
- ADM
- Corn Products
- Cargill
- Danone
- COFCO Foods
- McCain
- Meihua Biological Technology
- Royal Cosun
- Novozymes
- Unilever
- Biospringer

Distilleries
- E&J Gallo
- St. James Distillery
- Tequila Casa Cuervo
- Tereos
- Diageo
- La martiniquaise
- Usina Santa Isabel

Chemical industry
- AkzoNobel
- Samsung Petrochemical
- Zhengzhou Tuoyang Pharmacy
- Petroquímica Suape
- BP
- Vion
- Siam Mitsui PTA co
- Reliance PTA

Metal and Mining
- Anglo Coal
- Nyrstar
- Outotec
- Freeport McMoran

Bio energy
- COFCO Bioenergy
- Double A Ethanol
- Chemtex
- Nontong Zhengtuo Gas

Oil and Gas
- Pemex
- Petronas
- Shell
- XTO
- Nederlandse Aardolie Maatschappij

Municipalities
- Anglian Water
- Aquafin
- Southern Water
- Waterboard Hollandse Delta
- Vitens
- Severn Trent
- Waterstromen
- SAEIT Igaracú do Tietê
- CODEN Nova Odessa
- SEMAE Piracicaba

Technologies for your challenges

The world's natural resources are running low. It is, for example, expected that half the world's current high-grade resources of phosphate, which is an essential element in the production of food, will vanish before the end of this century. Also the reserves of some base metals will probably be depleted within a couple of decades.

Paques is world market leader in anaerobic wastewater treatment. Understanding the complex connection between water and energy is in our DNA. Paques developed several innovative technologies for producing renewable biogas from wastewater and for cleaning (bio)gas.

To facilitate the use of biogas as a green energy source, we introduced the THIOPAQ® desulphurisation technology. Over 100 plants prove the success of combining low total cost of ownership and high uptime.

For the recovery of base elements, Paques developed a number of technologies. The expertise in this field is rooted in several decades of innovation in wastewater treatment. Recover natural resources was a logical next step in the development of the Paques' technologies.

For the future, Paques expects the bioreactors to evolve from purification reactors to production reactors from high added value products and intermediates like biopolymers and building blocks. The production of a biodegradable plastic from wastewater is an alternative for conventional plastics produced from fossil fuels. Paques started several pilot projects in the field of the biobased economy.

www.paques.nl

Anaerobic technology	• Bacteria convert organic compounds (COD) into biogas • Non-oxygen environment • Reduction of discharge costs • Production of green energy	BIOPAQ®IC, BIOPAQ®UASB, BIOPAQ®UASBplus, BIOPAQ®AFR, BIOPAQ®UBOX
Sulphur technology	• H_2S removal from gas • Sulphate removal and metal recovery • Suitable for: - Weak acid bleeds - Sulphate in the chemical industry - Acid mine drainage and leach streams	THIOPAQ®, SULFATEQ™
Nutrient technology	• Removal of nutrients from effluents • Enables reuse of water in production process	ANAMMOX®, PHOSPAQ™, IONPAQ™
Aerobic technology	• Aerobic bacteria convert BOD to carbon dioxide and water	CIRCOX®, MBOX™
Metal technology	• Combines creating revenues from waste streams with environmental sustainability • Even low concentrations of dissolved base metals can be economically recovered	THIOTEQ™Metal, THIOTEQ™Scorodite
Filtration technology	• For suspended solids in wastwater streams • Water can be reused • Lowers the need for fresh water	ASTRASAND®, ASTRASEPARATOR®

Anaerobic industrial effluent treatment

By anaerobic effluent treatment almost every industry can decrease (production) costs and meet tighter discharge limits. The BIOPAQ®IC (Internal Circulation) is the number one proven technology, worldwide recognised as the most efficient way to clean industrial waste-water and produce biogas at the same time.

Biogas desulphurisation

Deep hydrogen sulphide removal from biogas at high uptime enables industries to meet stringent gas quality requirements. Removal of H_2S is required for reasons of health, safety, environment and corrosion of equipment. The elemental sulphur, produced by the THIOPAQ®, can be used as high quality fertiliser.

Sustainable nitrogen removal

The ANAMMOX® process is a very cost-effective and sustainable way of removing ammonium from effluents and ammonia from waste gas. Compared to conventional nitrification/ denitrification saving on operational costs can reach up to 60%, while CO_2 emission is reduced.

Paques: leading in biological wastewater and gas treatment

Paques has over 30 years experience in helping industries and municipalities to reduce their water and carbon footprints and reclaim valuable resources. The cost-effective effluent purification systems produce energy from wastewater, whilst purifying the water and facilitating water reuse. Since 1980, Paques realised more than 1800 references worldwide. Besides the headquarters in The Netherlands, Paques has subsidiaries and/or production locations in China, Brazil, United States of America, India and Malaysia. In many other countries, the company is represented by licensed partners. This ensures local presence and the best service for clients worldwide.

Contact one of our branch offices:

North America
Wilmington (DE), USA
t + 1 (412) 932 3540
e s.gorur@paques-inc.com

South America
Piracicaba, Brazil
t +55 (19) 3429 0600
e info@paques.com.br

Europe (HQ)
Balk, The Netherlands
t +31 (0)514 60 85 00
e info@paques.nl

India
Chennai, India
t +91 44 28 11 37 81
e info@paques.in

Asia Pacific
Kuala Lumpur, Malaysia
t +603 2169 6331
e rj.vanas@paques.com.my

China
Shanghai, China
t +86 (0)21 3825 6088
e info@paques.com.cn

www.paques.nl