# PROVIDING SOLUTIONS TO TODAY'S WATER TREATMENT CHALLENGES

## ADVANCED TECHNOLOGIES FOR TREATING INDUSTRIAL WATER AND WASTEWATER

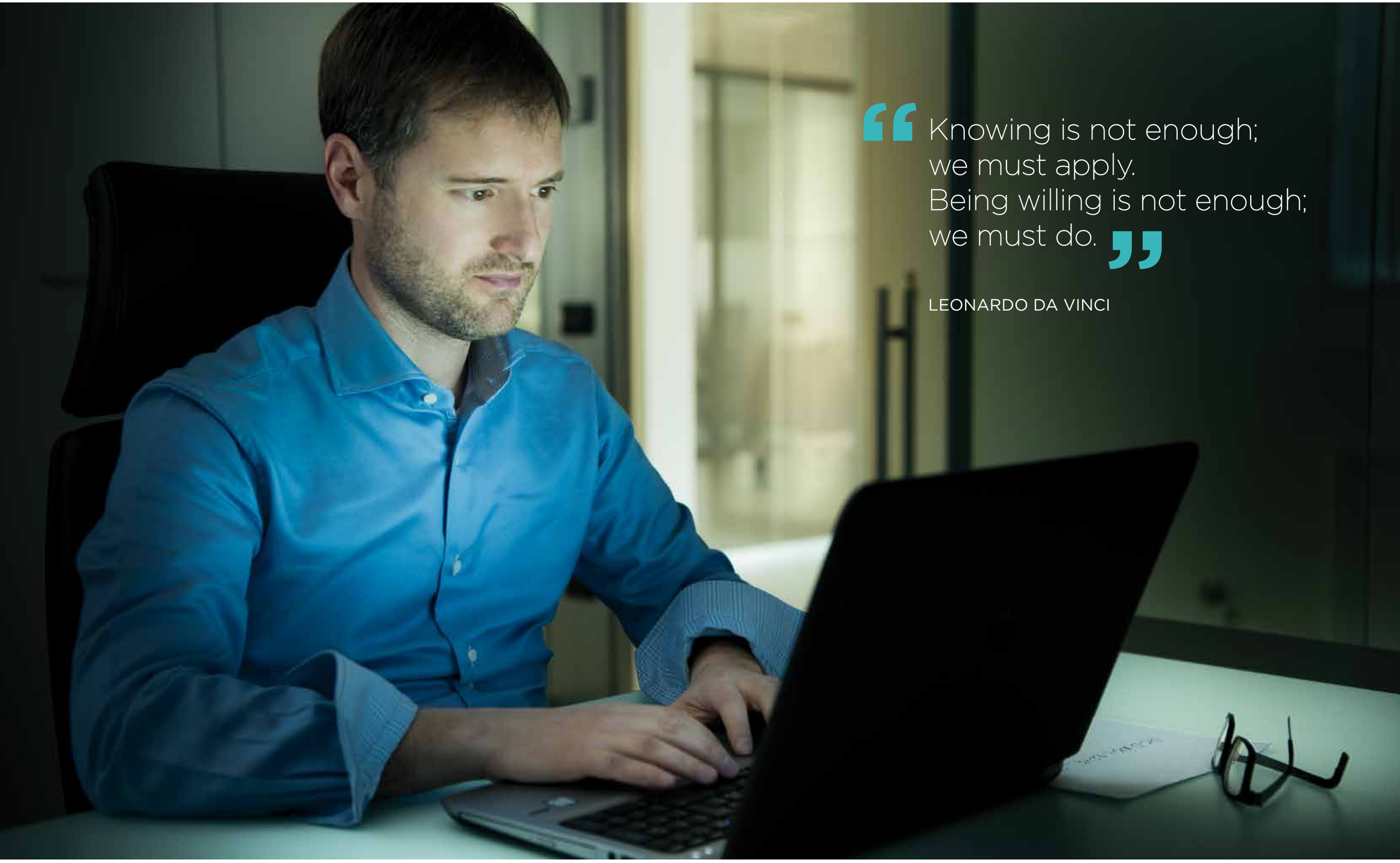
HT ENGINEERING

HYDROTECH

a gradiant company

20 YEARS

HYDROTECH ENGINEERING
a gradiant company



“Knowing is not enough;
we must apply.
Being willing is not enough;
we must do.”

LEONARDO DA VINCI

# HYDROTECH ENGINEERING: KNOWLEDGEABLE, FLEXIBLE AND SPECIALIZED

Hydrotech Engineering is headquartered in North Eastern Italy's industrial corridor.
Starting in 2001 our company has experienced unparalleled growth focusing on international markets.
The prerogative of the company is to design, manufacture, install and manage its installations.
The customer portfolio of Hydrotech Engineering boasts numerous **Fortune 500 companies**.

Hydrotech Engineering realizes advanced water treatment plants for the treatment of process and waste waters utilizing the most advanced semi-permeable membrane and biological technologies for water recycling and reuse.

since
2001

## SERVICE OFFERING:

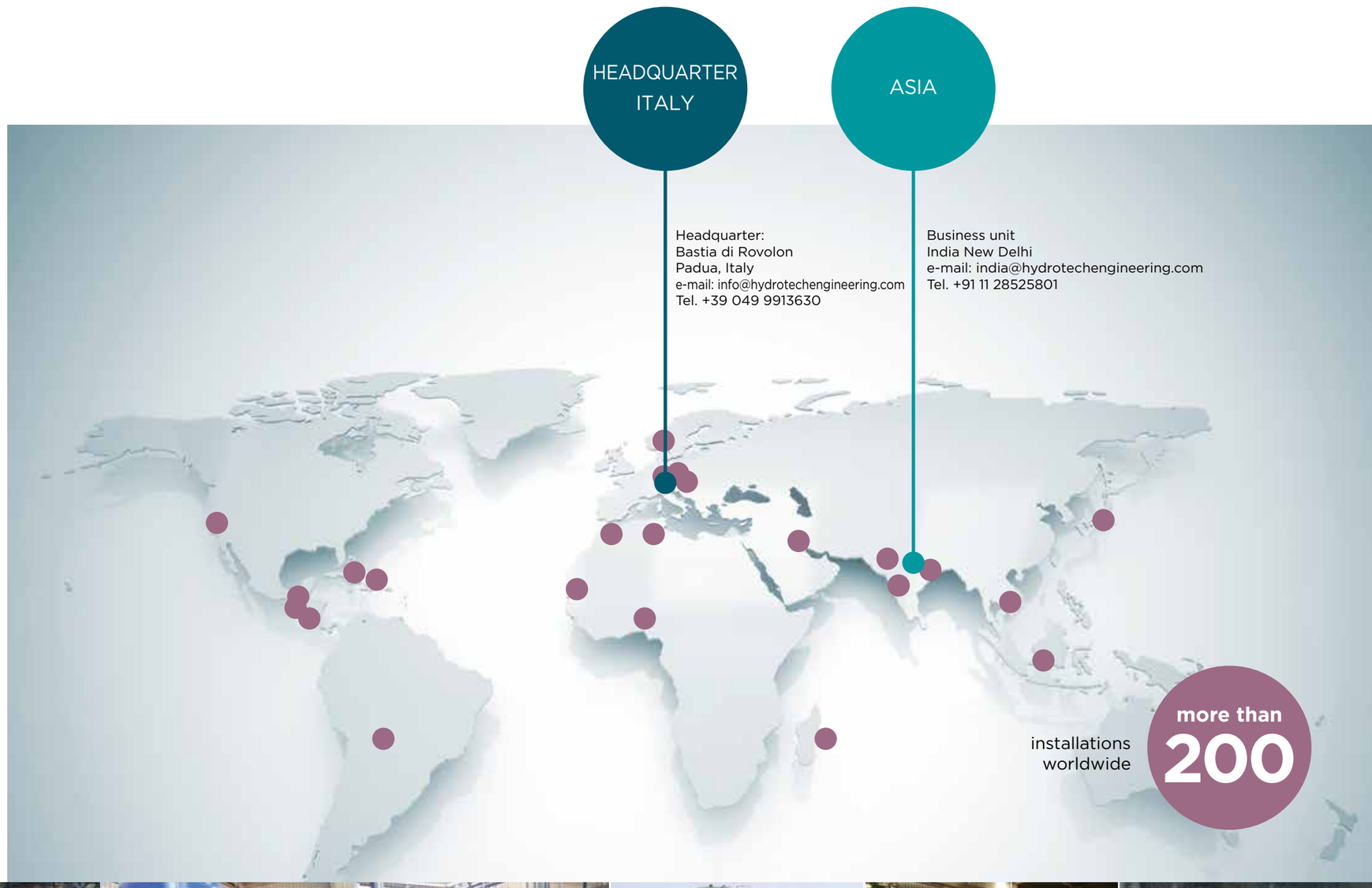
**ENGINEERING**
**SKILLED MANUFACTURING**
**INSTALLATION/COMMISSIONING**
**TRAINING**
**AFTER-SALES SERVICE**


HT HEADQUARTER

# OUR FOOTPRINT AROUND THE WORLD

Today, our team coordinates projects between the **Italian headquarters** and the business unit in **Asia**.

Hydrotech Engineering takes no shortcuts.
In a world where outsourcing is replacing trusted relationships between suppliers and partners, **Hydrotech Engineering goes the extra mile.**









# DESIGN, DEVELOPMENT AND MANUFACTURING: ALL IN HOUSE

To guarantee optimum performance of our technology and **to confidently adhere to the SLAs we control 100% of the entire project.** From the project design phase to engineering, testing, manufacturing and logistics, **our team owns each step of the supply chain.**

TECHNICAL DEPARTMENT



AUTOMATION DEPARTMENT

The production process at HT began long ago.  From the **design** of treatment processes, to **engineering** development and **construction**; every step is directly **executed in our workshop**. Continuous testing through onsite pilots and our advanced laboratories have allowed for perpetual fine-tuning. Our highly experienced technicians continue to improve the production processes and the quality of our machines. This is achieved by **acknowledging the needs and the feedback from our clients.** Another core differentiator is our **focus on the automation**, the control plants and their consequent energy efficiency. For this reason the design, construction and development of all automation components including control software of the installations are developed exclusively in-house.

PRODUCTION WORKSHOP

# OUR CUSTOMERS AND INDUSTRIES WE SERVE

PETROCHEMICAL

PHARMACEUTICAL

WASTE MANAGEMENT

TEXTILE & LEATHER

BIOGAS

AUTOMOTIVE & METAL

FOOD & BEVERAGES

PULP & PAPER

POWER

CHEMICAL

# OUR AREA OF EXPERTISE

## WASTE WATER TREATMENT AND RECOVERY:

- Reverse osmosis
- Ultrafiltration
- Membrane biological reactor (MBR) & anaerobic membrane biological reactor (AnMBR)
- Biological treatments
- Flotation

## SEA WATER DESALINATION:

- Reverse osmosis (Ultrafiltration pre-treatment included)

## DRINKING WATER TREATMENT:

- Biological filtration for iron, manganese and ammonia removal
- Reverse Osmosis
- Nanofiltration
- Ultrafiltration
- Multi media Filtration

## INDUSTRIAL WATER TREATMENT:

- Reverse osmosis
- Electrodeionization
- Ion exchange resins: co-current and packed bed process
- Mixed bed ion exchange resins
- Ion exchange softening
- Nanofiltration softening

## BIOLOGICAL PROCESSES:

- Membrane biological reactor (MBR) & anaerobic membrane biological reactor (AnMBR)
- Moving bed bioreactor (MBBR)
- Sequencing batch reactor (SBR)

## SPECIAL APPLICATIONS:

- Digestate treatment from biogas production
- Zero Liquid Discharge - Textile
- Landfill leachate treatment

# LEADERS IN PURIFICATION

## CASE STUDY: DIGESTATE FROM ANAEROBIC FERMENTATION FROM BIOGAS PRODUCTION

Anaerobic digestion is a biological process by which the organic matter from various origin is turned into biogas for energy production. This energy production process generates a residual product called anaerobic digestate. The characteristics of this residual product are: organic matter difficult to biodegrade, high presence of suspended solids and an elevated nitrogen concentration.

**Organic matter from various sources** YES

**Transforming digestate from a liability into an asset** YES

| | |
|---|---|
| COD reduction | 99.8 % |
| TS reduction | 99.5 % |
| TKN reduction | 99.4 % |
| Recovery up to RO only (purified water/inlet digestate) | 75.0-80.0 % |

**Read the QR code and discover the case study**

Hydrotech Engineering uses the most modern technologies in the field of semipermeable membranes which allow the removal and recovery of nitrogen present in digestate. In addition, **high quality water is obtained** which can be **reutilized** in the **industrial process** or discharged in accordance to the most stringent environmental regulations.

## THE PROCESS

Hydrotech Engineering has developed a multi-step process to treat digestate in the most efficient method. Our process encompasses the following steps: MBR, side stream Ultra Filtration and double stage/double pass Reverse Osmosis.

## STREAMS GENERATED BY OUR SOLUTION

- **80% pure water which meets all discharge limits.** Example: COD levels up to 10ppm. Clients reutilize this rich source of pure water for their industrial needs on site.
- **20% Reverse Osmosis concentrate** that can be either **evaporated into an organic fertilizer** or utilized in the humidification process for **compost production.**

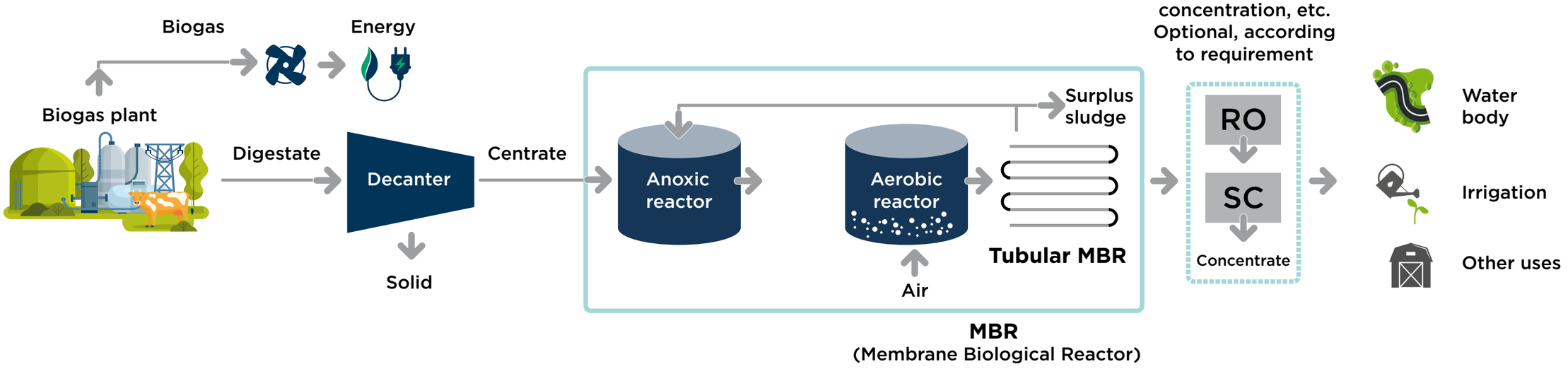
## OUR NUMBERS

Since **2009**, Hydrotech Engineering has designed and built **over 24 plants** for the treatment of digestate from anaerobic fermentation.

**Meets the most stringent limits** — YES

**Achieves a Zero Discharge System** — YES

**Operates on minimum running costs** — YES



# CONFIDENCE FROM ACHIEVING OPTIMUM RESULTS

## CASE STUDY: ZERO LIQUID DISCHARGE TEXTILE

Example application: **Textile Industry**
**Water Reuse** is a fundamental component in the battle for sustainable & integrated water resource management and water supply alternatives.
The textile industry was the **first** to have **embraced** our **Zero Liquid Discharge** technology.

### TECHNOLOGY CAPIBILITIES

Today, Hydrotech Engineering is the leading company in this field providing total effluent recovery. The companies using our technology in India, Pakistan and Bangladesh supply the top **5 global retailers** with their fabrics, garments and houses-hold textiles.

### ENVIRONMENTAL BENEFITS

By implementing our Zero Liquid Discharge technology our customers are **reutilizing on a daily basis over 100,000 m³** of their effluent generated in the manufacturing process instead of discharging into local waterways.

### ECONOMIC BENEFITS

From a competitive advantage standpoint, our customers benefit from having the **lowest industry running costs.** On average our technology utilizes **45% less to operate** and manage than the competition making Hydrotech Engineering Zero Liquid Discharge the most competitive technology today.

Our technology is modular enabling plants large and small to achieve ZLD. Currently, our customer portfolio **ranges from treating 50-1000m³/h.**

To learn more about Hydrotech Engineering please request an appointment by calling our office closest to your location.

**130,000** **m³ daily recovery of industrial effluent**

**-45%** **lowest industry running costs**

| | |
|---|---|
| Recovery of multistage RO (reused water/inlet waste water) | up to 93.0% |
| Multi stage RO: highest energy efficiency | 1.50 kWh/m³ approx. for the entire recovery cycle up to the RO |
| Inlet Raw Water TDS | up to 10,000 ppm |
| Waste water from different Textile processes: no problem, we have been dealing with all of them | |

# OUR TWO ZLD APPROACHES

Both processes begin with a BIOLOGICAL PRETREATMENT followed by the FILTRATION section performed by UF SIDE STREAM or MBR technology ending with our highly efficient multistage REVERSE OSMOSIS.

**BIOLOGICAL PRETREATMENT**

✓ LOWEST ENVIRONMENTAL IMPACT

✓ GREAT PERFORMANCES

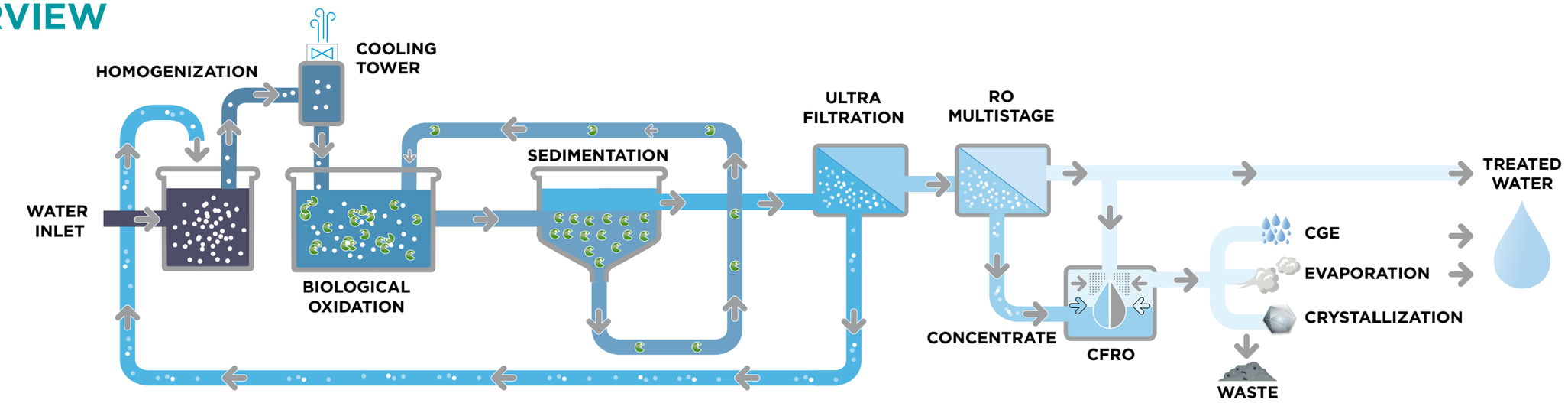
**FILTRATION PROCESS**

QUARTZ FILTER → UF SIDE STREAM

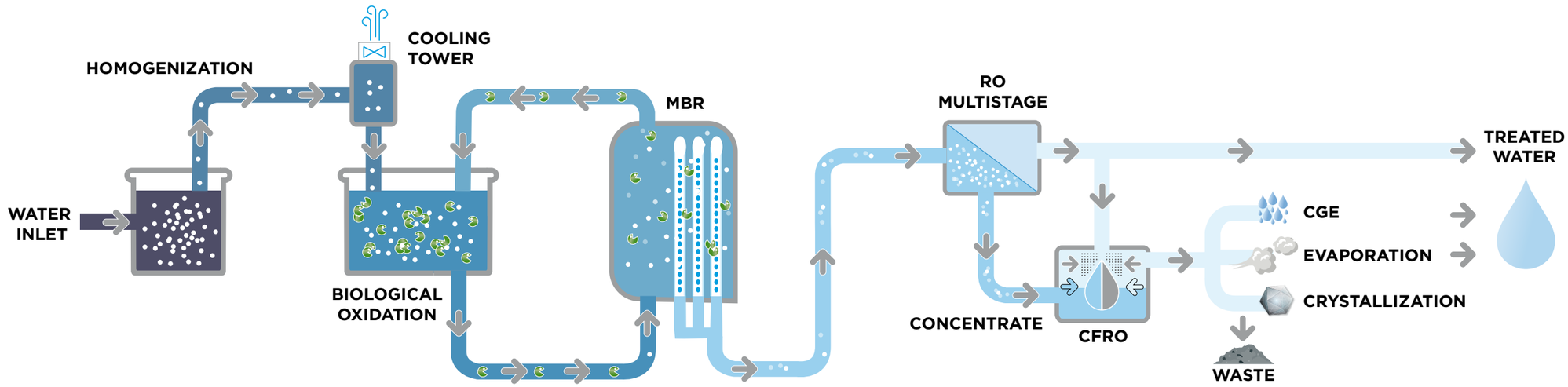
MBR

**MULTISTAGE REVERSE OSMOSIS**

## THE PROCESS OVERVIEW




## UF SIDE STREAM TECHNOLOGY




## MBR-REVERSE OSMOSIS TECHNOLOGY

# HYDROTECH ENGINEERING IN THE PHARMACEUTICAL INDUSTRY

## CASE STUDY: ACTIVE INGREDIENT EXTRACTION

Hydrotech Engineering also provides solutions suited to the **highly stringent pharmaceutical industry.**

Using advanced semipermeable membrane technology Hydrotech Engineering can meet the needs for process water and ultrapure water. This specific process application enables the **extraction of active ingredients** through the **concentration and purification** of the matter according to the most diversified Customer requirements.



## PROCESS WATER QUALITY MANAGEMENT

Wastewater treatment is also an important part of pharmaceutical manufacturing for numerous reasons. First, the pharmaceutical industry requires a **large volume of water** for various processes, and chemicals and other substances used in the manufacturing process often result in large amounts of wastewater with **high levels of contaminants** and/or organic content that require specialized treatment (whether for reuse or discharge). Further, companies are increasingly integrating recycled water into their industrial processes. This practice can yield significant **benefits from an environmental standpoint**, through the conservation of raw water resources or by helping to reduce energy consumption. However, wastewater destined for recycling must also be treated appropriately before it can be reused, and in the case of pharmaceutical manufacturing plants, **more intensive treatment is required.**

## A SOLUTION TO ALL VARIABLES

Pharmaceutical industry wastewater varies enormously in flow and composition, depending on factors such as the production rate, the specific preparation being carried out, which activities are generating the waste water, etc. All these variables mean that **the pollution of the final effluent can be very diverse and mutable** over time. The best techniques for treating the effluents generated by this type of industry depend on **each specific case**, given their considerable variation and the wide range of possible compounds. Hydrotech Engineering **can cope with all these variables** to find the best solution in terms of process efficiency and operational costs always in compliance with the highest environmental and quality standards.

# EFFICIENT PROCESSES

## CASE STUDY: PURE WATER FROM BRACKISH AND SEAWATER

The world's shortage of freshwater is increasing on a daily basis.  According to the United Nations by 2025 two-thirds of the world's inhabitants will face water shortages.

97% of the water on earth is salted which is not usable for industry or agriculture. Using membranes' desalination is an obvious solution to the lack of fresh water we face.

In this difficult scenario Hydrotech Engineering provides efficient and economical solutions. Today, Hydrotech Engineering utilizes advanced Reverse Osmosis desalination technology **to transform brackish and seawater into safe, affordable water for drinking and industrial uses.**

**Seawater for drinking and industrial use** — YES

**Ultrapure water for specific industrial use** — YES

**EDI technology to produce ultrapure water** — YES

### THE PROCESS

Hydrotech Engineering provides turnkey solutions utilizing membranes technology designed specifically for the characteristics of treating different types of water sources in the most cost-effective way. No project is the same. For this reason each customer is treated singularly and is provided with a **tailored solution.**

Should there be the need to produce water with the highest purity level, Hydrotech Engineering can utilize the **electrodeionization technology (EDI)** after the membranes. Thanks to this technology, that is not using chemical products (thus once again with a low environmental impact) we can produce **ultrapure water** for all the applications where water is required with extremely high characteristics, such as in the power and in the electronic industry fields.

- Customers receive integrated, high quality and consistent systems
- Modular designs adapt to site and project specifications for a unique solution
- Engineering and field services are available to design, commission, or start up systems

# THE BENEFITS OF CONTROL AND CONTINUAL R&D


Hydrotech Engineering boasts of a state-of-the-art onsite laboratory enabling the company to be at the **cutting edge of R&D.**
The team managing the laboratory constantly **pushes the envelope** to find new ways for optimizing our customer's processes. Another benefit to having our own laboratory is the ability to eliminate wait time in finding resolutions for our projects. Hydrotech Engineering **continues to invest** in the future and is open to engaging with forward thinking, like-minded customers/companies.

# EXCELLENCE IN INDUSTRIAL WATER TREATMENT PROCESSES

### TURNKEY PLANTS

- Creation of state-of-the-art tailor-made systems
- Quality assurance, cost and project time reduction
- Complete management: design, development, in-house construction and after-sales service

### AUTOMATION

- In-house software for universal plant management
- Plants designed to automate maintenance activities, reduce operating costs, maximize production and reduce downtime

### REMOTE CONTROL

- Continuous monitoring of parameters and timely remote intervention by a specialized in-house team
- Preventive maintenance and optimization of plant performance

### PILOT PROJECTS

- Risk reduction and prior assessment of the feasibility of the project through the construction of pilot plants
- Supply of the best technologies with the highest performance on the market

### PRE-ASSEMBLY

- Construction and pre-assembly of the plant and all ancillary sections in Italy by a specialized team
- Reduction of plant footprint, costs and optimization of logistics

### INTERNATIONAL VENDORS

- Collaboration with the best international suppliers to ensure reliable and high-quality solutions
- Immediate service for spare parts that are quickly available

### ZERO LIQUID DISCHARGE

- We specialize in the implementation of advanced solutions for wastewater treatment
- 100% recycling of wastewater with a reduction in environmental impact and water consumption

### CERTIFICATIONS

- Increased plant quality and safety
- ISO 9001:2015 certification

# ADVANCED WATER TECHNOLOGIES

**Discover here the reference list:**

**Download the brochures here:**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HYDROTECH
ENGINEERING
a gradiant company

ADVANCED TECHNOLOGIES FOR TREATING
INDUSTRIAL WATER AND WASTEWATER
PROVIDING SOLUTIONS TO TODAY'S
WATER TREATMENT CHALLENGES.


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