



TECHNOLOGICALLY ADVANCED PLANTS FOR WATER TREATMENT

LANDFILL LEACHATE · INDUSTRIAL WATER · SEAWATER DESALINATION



A wide range of Reverse Osmosis plants with flat membranes, technologically advanced for the leachate treatment of municipal solid waste and similar landfills.

Exxro develops and builds Reverse Osmosis plants for the treatment of municipal solid waste landfills and plants for civil and industrial water treatment. Thanks to our extensive experience in the water purification field, **Exxro is specialized in building Reverse Osmosis, Nanofiltration and Ultrafiltration Plants**, using high-performance flat membrane. During the latest years it is emerging as one of the most important Italian Companies in this field.

Creating so many Reverse Osmosis Plants for the landfill leachate in Italy was possible thanks to the professionalism of highly skilled and trained technicians who study the most appropriate technologies of processes to achieve ever more efficient purification results.

We carefully choose the materials with which we build our plants to create high quality standard equipment with high operating efficiency and durability.

In our workshop plants are built on specific customer request and they are specifically studied to solve every purification problem for each kind of waste water.



Through a very careful analysis of the liquid to be treated, our technical office studies the best configuration to achieve maximum results both quantitative and qualitative. Our designed plants can be installed inside insulated containers or on specifically designed skids.

Our plants are fully automated, complete with all filtration control systems and do not require any pre-treatment with chemical products. A continuous monitoring system of water to discharge parameters ensures the safety of the water to the drain according to legislation.

A group of specialized technicians works to assemble our equipment, provides services and maintenance and complete management.

We also offer to our customers the possibility to rent our Reverse Osmosis Plants, with a full or partial service contract, because we are confident about the quality and the excellent results of our equipment.



PARAMETERS	LEACHATE	PERMEATE	REJECTION %
Conductivity	35.000 μS	15 μS	0,98
COD	17.800 mg/l	< 20 mg/l	0,99
BOD5	5.100 mg/l	< 5 mg/l	0,99
Azote	3.900 mg/l	0,6 mg/l	0,99
Chlorides	6.390 mg/l	13 mg/l	0,98

STRENGTHS

Simplified pre-filtration:

The open channel EXXRO module can operate without any problems on fluid with a Silt Density Index (SDI) 10 times higher than traditional membranes.

Low chemical operating costs:

EXXRO module technology means that no permanent feedwater pretreatment with acid is required.

High recovery rates for low energy costs:

Specific plants design, high efficiency electric motors and design details permit high recovery in energy costs.

Long membrane life:

A useful membranes lifetime up to 4 years of uninterrupted working.

Lower membrane replacement costs:

Module membrane system offers the possibility of replacing individual sheets of membrane at a fraction of the cost.

High quality cleaners:

We produce high quality cleaners which facilitate membranes' long service lifetime.

High quality product water:

EXXRO membrane system uses the latest advanced technology, high chemical stable, with thin film composite. In addition, the use of membrane in sheet form guarantees the selection and an accurate control of the installed membranes in order to ensure an high quality permeate.

Compact and flexible modular units:

Modular design and construction of all EXXRO plants simplify the transportation and the installation and enable flexible use even in limited floor spaces.



Plants installed and operative:

EXXRO systems are completely assembled and tested prior in the factory, the plants can be installed at customers' in a short time.

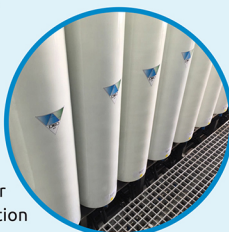
Plus low-cost maintenance, operation and service:

Modular construction guarantees clear access to all major components and piping, this means that inspection and maintenance can be carried out quickly and effectively. Automatic operation and regulation of the system, fail-safe design ensure correct, safe and reliable operation of the system.



NANOFILTRATION

EXXRO develops and builds Nanofiltration plants with flat membrane plate modules for the treatment of industrial water and especially for sulphate elimination from waste water.





EXXRO ultrafiltration membranes are designed on a hollow fiber system which guarantees a large scale of application.

Ultrafiltration is a pressure driven separation process, where the water to be treated is separated by a porous membrane into a stream of purified filtrate and a remaining quantity of concentrate. Ultrafiltration membranes are safe barriers against bacteriae, viruses, colloids and also macromolecules.

APPLICATION

Low concentrations

- Pathogens and phosphates removal from sewage
- Pretreatment for reverse osmosis units
- Disinfection of drinking and surface water
- Treatment of filter backwashing effluents
- Water recycling in the paper industry
- Replacement for multilayer filtration systems

High concentrations

- Treatment of biological effluents
- Chemical wastewater treatment
- Grey and black water treatment on ships

EXXRO MODULE UF

Ultrafiltration membranes

- Safety barrier for pathogenic microorganisms like viruses and bacteriae
- Separation of colloids and dissolved organics of high molecular weight
- Long service lifetime of membranes since internal pore blocking is unlikely in case of UF
- High availability of the units
- Dead-and and cross-flow operation possible

Open feedside channel

- Long operation intervals between flushing/cleaning because of the high module loading capacity for separated solids
- Straight-through flow without dead zones
- No prefiltration required

Simple cleaning

- Feedside airbubble flushing: high shear stresses of the two phase system air/water
- Permeate backflushing possible

Low operating costs

- Low specific energy consumption
- Fully automated operation
- High water recovery rates up to 98%
- Simple plant-assembly
- Simple membrane replacement

Low investment costs

- Optimum material selection (low cost plastic where possible)
- Minimum number of sealings
- Simple system design by modular construction

Environmental aspects

- Chemicals which guarantee high performances
- Minimized concentrate disposal because of the high water recovery rate





WATER TREATMENT PLANTS

SEAWATER DESALINATION

Exxro develops and builds Reverse Osmosis plants for seawater treatment for the production of sterilized and desalinated water by using plate membrane system.

Plants are designed and constructed for continuous operation to desalt and purify seawater, brackish and industrial waste water.

Thanks to fluid dynamics of the **plate system membrane scaling and fouling can be minimised** and kept on an easily controllable degree.

Low use of acid is required for feedwater pretreatment.

Energy recovery systems among the most advanced which guarantee remarkable operating costs cut; up to 30% from **seawater-energy costs average only 10kWh/m3 of pure water.**

These figures are referred to standard systems, while using brine energy recovery for seawater desalination energy cost can be reduced by as much as a further 50%.

Useful **membrane life up to 4 years** is a realistic figure thanks to the combination of **low membrane scaling and fouling**, highly stable membranes and a **simple inbuilt cleaning system.**

Modular construction and purpose-designed clear access to all major components and piping means that inspection and preventative maintenance can be carried out quickly and effectively.

ROEX220 module system permits **replacement or inspection of each individual sheet of membrane** thanks to easy opening up of the module itself which is impossible on other types of RO modules.

Automatic operation and regulation of the system, fail-safe design and fault indication facilities ensure correct, safe and reliable operation of the system.

Our flexibility allows us to **fit any particular request from our clients** in terms of accessories, components and quality of produced water.

The result is high quality water and high productivity plants.





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