Gefico

Land Based

Content

GEFICO

Gefico is a leading company in design, development and supply of solutions for the water treatment market.

The high quality of our products is the result of over 40 years of experience acquired as specialists in seawater-potabilization. Our products and solutions are designed and intended to operate in extremely harsh conditions.

Through a worldwide network based on more than 50 offices, Gefico is able to supply spare parts and services of new and existing units delivered up to now.

In 2011, Gefico became part of industrial group Cetus. With a quality product certificate, the group focuses on sustainability and environmental solutions, holding several innovation awards and CSR (Corporative Social Responsibility)

Environmental impact is one of our main concerns. We therefore work to minimize negative impact on the environment by continuously developing new opportunities compatible with sustainable development.

We use life-cycle assessment (LCA) to measure and quantify the environmental impacts associated with all the stages of a product's life.

TECHNICAL WATER

Some industrial applications and processes require ultra-pure water with extremely low levels of contaminants. Gefico evaporator plants are designed to cover this demand.

Our purpose is support efficiency to the industry by minimizing environmental impact through taking advantage of existing resources.

All our systems are developed complying with different international standards, material specifications according to customer´s requirements.

DRINKING WATER

Membrane filtration has a number of benefits over the existing water purification techniques.

Based on the types of particles that are removed from the water with each type of membrane filter, we can summarize different techniques:

1) High Pressure Reverse Osmosis
Indicated for seawater treatment with salt concentration higher of 10.000 mg/l.

2)Low Pressure Reverse Osmosis
Indicated for the brackish water treatment with a salt concentration between 1.000 and 10.000 mg/l.

3)Ultra- filtration
Indicated for groundwater and surface water clarification.

Viscofan. Evaporator AQ-100/120A in CHP plant. Navarra - España

Kenia. Courtesy of DWL WATER

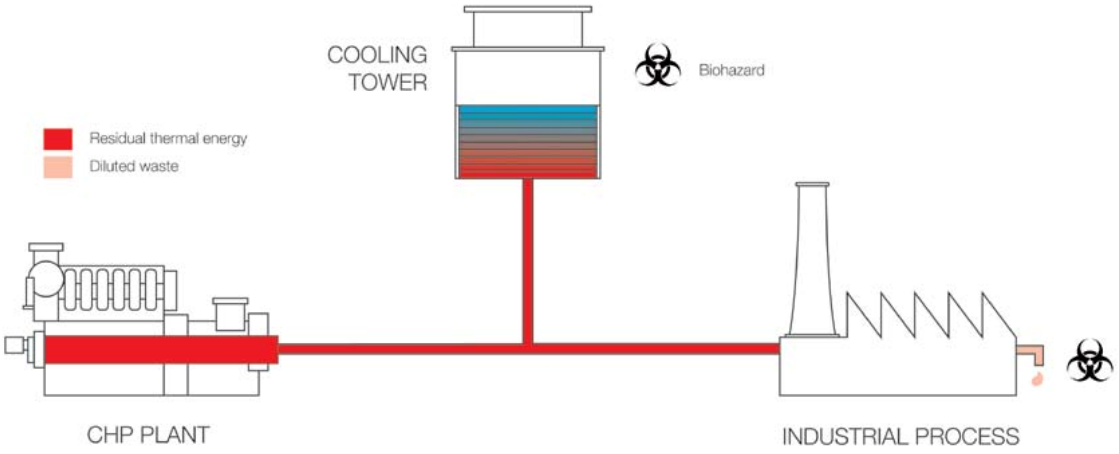
EVAPORATION

Gefico Evaporators take advantage of the waste heat of several sources such as CHP plants, increasing their energy efficiency classification. That reduces the environmental impact, operational interruptions and helps to obtain a better price per kilowatt.

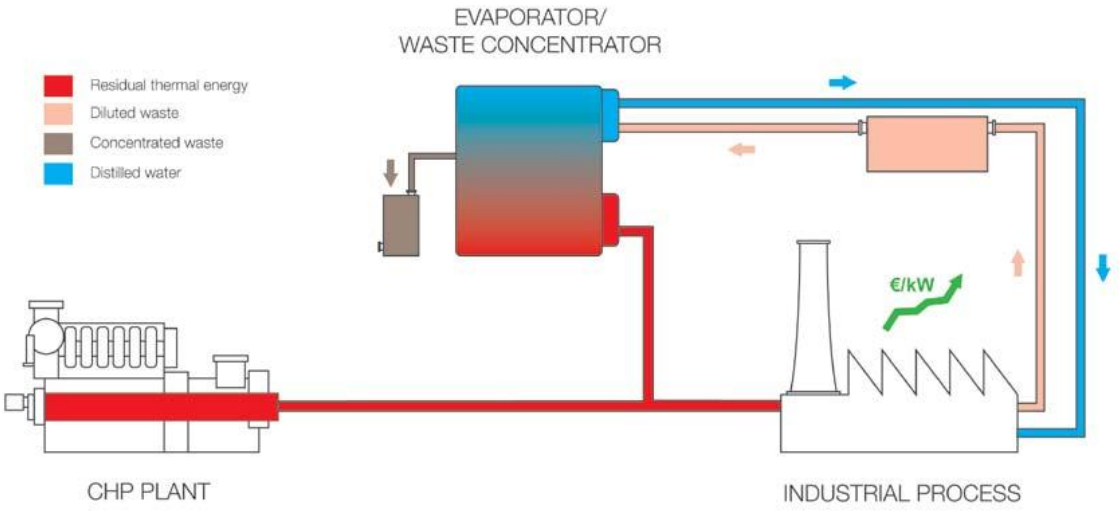
Our evaporators are specially indicated for CHP plants installed at Food Industry facilities, among all industrial processes requiring wastewater treatment or need of technical water.

Cooling tower at the CHP installations can cause health and safety problems. By applying this solution, we can prevent cooling towers from becoming a public health risk or environmental issues.

Gefico´s thermal oil, water, single or double stage evaporators minimize waste and allow discharge according to international standards requirements.



Standard CHP process.



Process taking advantage of resources with Gefico evaporators.

REVERSE OSMOSIS

The Gefico RO Unit uses reverse osmosis technology. Solute is retained on the pressurized side of the semipermeable membrane and the pure solvent is allowed to pass to the other side and consequently salt cannot pass through the membrane.

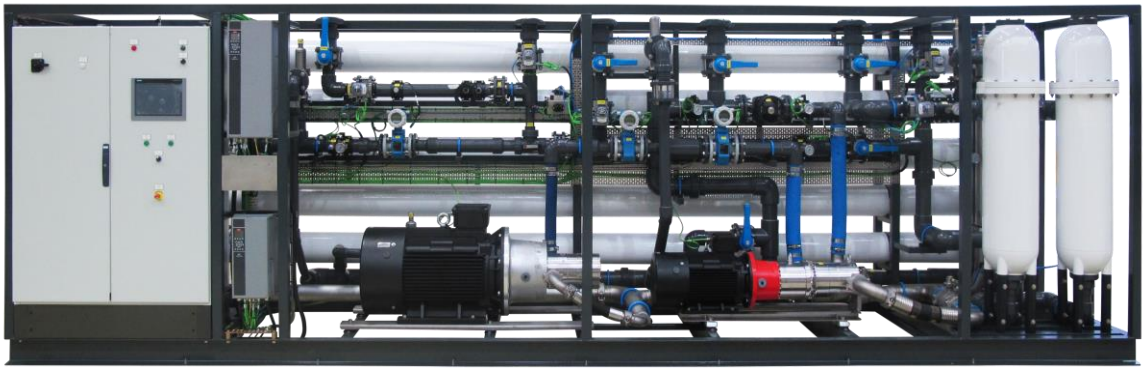
There are two types of Reverse Osmosis processes for generating freshwater, high and low pressure process.

In the high-pressure process, the pressure is between 50-70 bar. In the low-pressure process, the pressure is 12-20 bar.

Our RO Units can treat water to be used as potable water or intended for the industry or agriculture sector, ensuring the minimum consumption.

Gefico´s units are modular made. All components are installed in a common frame so only the Booster Pump, Disc Filter and Dichlorination filter are loose-supplied for the installation at the feed flow.

Gefico offers the possibility of developing different proposals for RO systems in compliance with different regulations, required specifications, and customer´s requirements.



Automatic RO plant of 500 m3/day

Containerized RO plants with pre and post treatments

ULTRAFILTRATION

Gefico UF Systems remove high-weight molecular substances, colloidal materials, and organic and inorganic polymeric molecules with a size bigger than 0.05 µm, ensuring a better quality of treated water.

Our UF modules are compact and easy to use. With a wide range of products going from high capacities systems to portable units to obtain water in remote areas or emergency situations.

When there's no easy access to power supply, Gefico units can take advantage of solar power technology up to 50 ton/day.

Benefits of UF technique are as follows:

- Constant water quality, regardless of feed TSS (turbidity <0.1 NTU).
- Efficient removal of pathogens in water.
- Protozoan parasites such as Giardia lamblia, Blastocystis hominis, Cyclospora cayetanensis, Cryptosporidium, Balantidium coli, Entamoeba histolytica, etc.
- Fecal contamination due to: fecal coliform, E coli, fecal esterococos, Clostridium perfringens and somatic colicafagos.
- 99.999% removal of bacteria as Leptosporona, Campylobacter jejuni, Yersinia enterocolitica, etc.
- Reduction of organic material between 50 and 90%.
- Undissolved Heavy metals.

KLAR series for ultrafiltration.

Solar UV disinfection unit

Solar ultrafiltration unit.

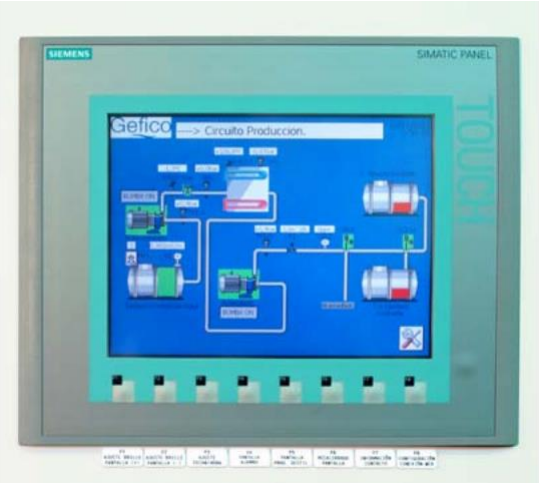
AUTOMATIC PROCESS

Our automation systems are delivered with integrated software ensuring that you achieve maximum efficiency in the broad scope of operations.

This control ensures a better process optimization, monitoring different critical parameters to adjust water production.

The system can be remote operated by a TCP/IP system or locally.

Through our automation systems, you can reduce costs and improve the quality and safety of the installation.

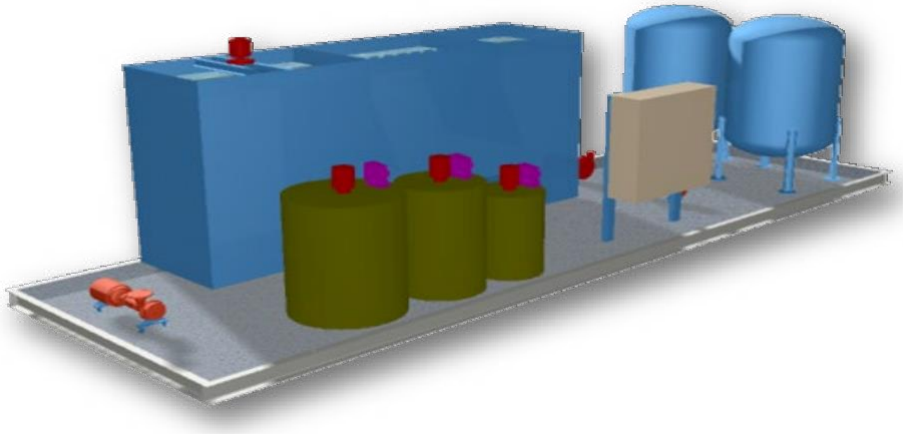


Control Software for a Gefico evaporator.

MAIN REFERENCES

We solve the waste problems and water needs, from fresh to distilled water, for any kind of industry. Milk, oil, food-process, mechanical manufacturing, hotels, chemical, pharmaceutical industries, etc. The high-Quality requirements for these industries, combined with the technical complexity and the relevance of these facilities, require trustworthy solutions, avoiding production stops that could generate huge loss. In the same way, our fast spare parts Service guarantees the maintenance of our units without altering the good performance of the plant.

- PARANÁ INSTALLATION



GEFICO has developed this standard installation following the ModuLINE System method

**Standardized system of treatment modules, to configure compact facilities in transportable units.*

They work by gravity and the design allows, from 6 basic modules to grow in production by incorporating up to three parallel lines, all of which are autonomous.

They are designed to produce drinking water using surface water (rivers or lakes), and free of chemical contamination.

The recommended maximum concentration MeS (Suspended Matter) must be less than or equal to 500 mg/l.

Water with higher content can be treated, but reducing the performance.

The water produced is potable water in accordance with the O.M.S. for the quality of drinking water.

5 basic modules have been developed to carry out the complete clarification treatment:

Module	Flow (m^3/h)
B-005	5
B-010	10
B-015	15
B-020	20
B-030	30

Table of Models, Flows and population supplied

MODEL	1 LINE			
	Flow		Population	
	l/sec	m³/h	150	200
B-005	1,4	5	767	575
B-010	2,8	10	1.533	1.150
B-015	4,2	15	2.300	1.725
B-020	5,6	20	3.067	2.300
B-030	8,3	30	4.600	3.450

MODEL	2 LINES			
	Flow		Population	
	l/sec	m³/h	150	200
2B-005	2,8	10	1.533	1.150
2B-010	5,6	20	3.067	2.300
2B-015	8,3	30	4.600	3.450
2B-020	11,1	40	6.133	4.600
2B-030	16,7	60	9.200	6.900

MODEL	3 LINES			
	Flow		Population	
	l/sec	m³/h	150	200
3B-005	4,2	15	2.300	1.725
3B-010	8,3	30	4.600	3.450
3B-015	12,5	45	6.900	5.175
3B-020	16,7	60	9.200	6.900
3B-030	25,0	90	13.800	10.350

CONCEPT

Compact and standardized, the PARANÁ installation is designed to solve the needs of fresh water for cities, small associations and industries. Its main features are the modular design, performance, security and ease of operation.

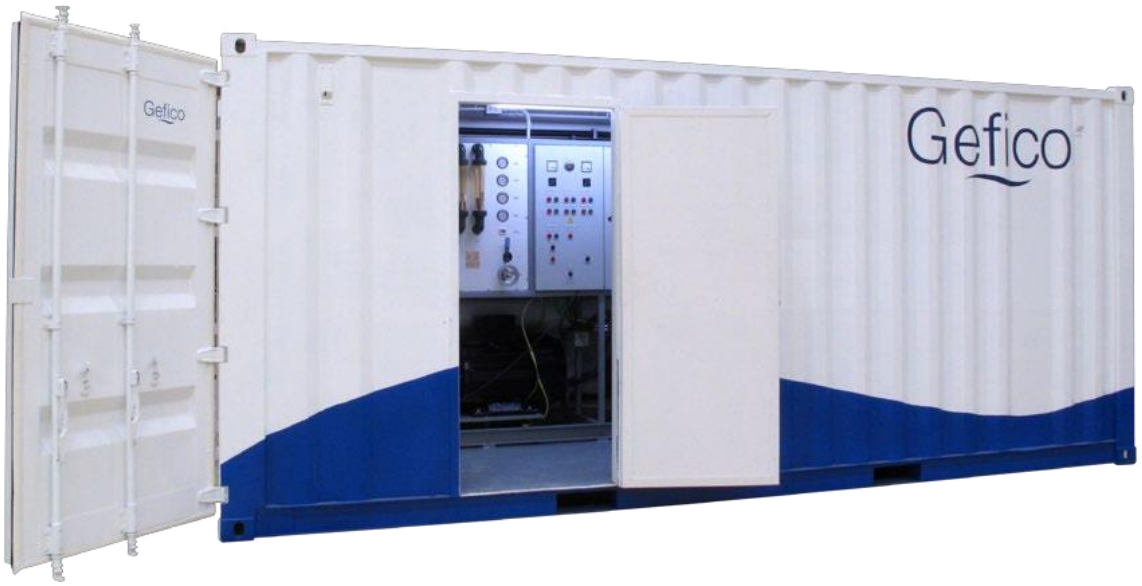
Thanks to the use of modern technologies, the installation guarantees respect for the O.M.S. and the production of very high quality water.

At the outlet of the unit, a pressure of 2 bar (up to 7 bar optionally) allows a high tank to be fed in order to supply:

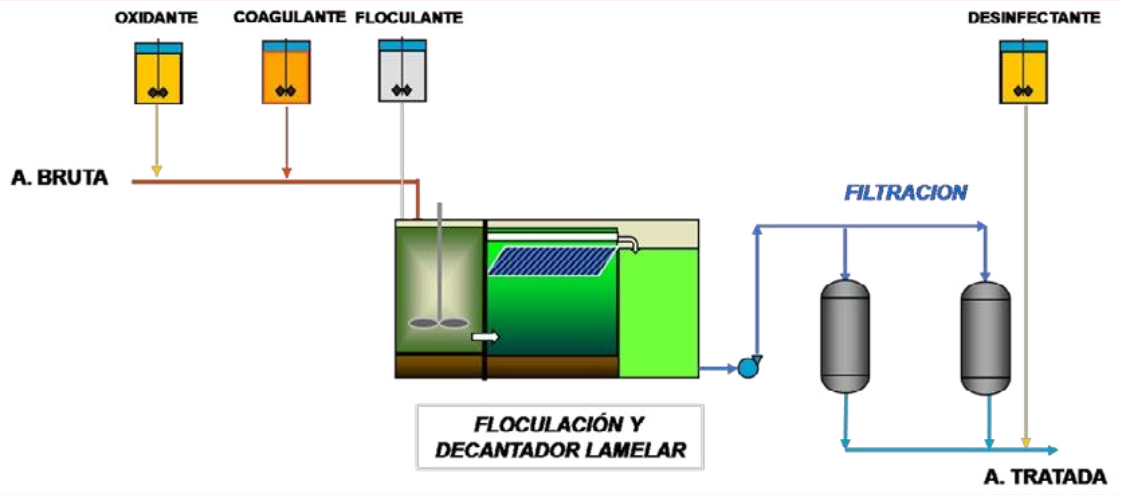
- fresh water to municipalities
- process water for industries

Its exterior dimensions respect the international norms in force for land or sea transport in 20 or 40-foot containers.

Entirely manufactured and assembled in the workshop, the PARANÁ installations are subjected to hydraulic and electrical tests after the construction and assembly of the equipment.



OPERATION



COAGULATION-FLOCCULATION

After the addition of a coagulant, the raw water is admitted into a flocculation chamber in order to increase the volume and cohesion of the flocculus.

DECANTATION

It is done in a decanter equipped with lamellar modules that accelerate the separation of the flocs. The sludge stored in the bottom of the decanter is extracted automatically and regularly.

The passage of water between the flocculation zone and the decantation zone is ensured by a tranquilization chamber located under the lamellar modules.

The decanted water is stored in a tank attached to the decanter and pumped to the filtration.

PRESSURE FILTRATION

Inside the filters the water is distributed above the filter bed through the sand that retains the suspended solids. The nozzles located in the false bottom collect the water uniformly, under pressure, which allows it to reach the treated water tank.

WASHING AIR / WATER
It is carried out countercurrently by return of filtered water from the filter in service and addition of air. This:
• Allows excellent cleaning of the filter bed.

• Reduces the duration of the washing of the filters.

• Eliminates the need for a tank and a washing water pump.

• Reduces the consumption of washing water.

OPTIMIZATION
Civil works are limited to a concrete platform and a drainage channel connected to a drain.

The implementation of the installation is fast and the electrical and hydraulic connections only need a short intervention.

OPERATION
The design ensures a great flexibility of use. The PARANÁ installation is put into service and automatically stops depending on the water demand, without particular precautions.

The operation steps are reduced and the standardization limits the storage of spare parts.

- FRESH WATER SUPPLY IN PUERTO LOBITO (ANGOLA)

The challenge of this project was to provide drinking water to the population of Porto do Lobito in Angola, a place under limited development conditions.

A study and development of the project was carried out and ended with the installation of two plants in independent containers of 40 feet.

Each container is equipped with a reverse osmosis unit model AQE-60D, with the pre and post-treatment system suitable for obtaining drinking water from seawater, according to the requirements of the WHO (World Health Organization).

OTHER REMARKABLE PROJECTS

- CONTAINERIZED PLANTS FOR IRAN-ASIA

Reverse Osmosis desalination plant installed in an ISO container of 20 feet, to produce 240 tons of drinking water a day, from seawater source.

- SEA PRODUCTS PROCESSING PLANT

Drinking water treatment plant model AQE-25BW for the treatment of brackish water (salt content between 1,000 - 10,000 mg/l) through Reverse Osmosis at low pressure, 10-20 bar.

- FISH FARM AT A CORUÑA

Reverse osmosis purification plant model AQE-100 to obtain one hundred tons of potable water used for the fish farming process.

- CHP PLANT FOR A MILK FACTORY

Distillate plants by evaporation AQ-50/60 to obtain distilled water used in the different production processes. Boilers, refrigeration circuits, etc. In the photo, the Grelva-Puleva cogeneration plant in Granada.

- FISH CANNING PLANT

AQE-30D drinking water treatment plant for obtaining drinking water used in the processing and packaging of canned food.

- INDUSTRIAL PLANT OF SOAPS AND DETERGENTS IN MURCIA

Distillate plants by evaporation, model AQ-60/70 for obtaining distilled water as part of the industrial processing of the manufacture of soaps and detergents.

- CHP PLANT IN NAVARRA

Evaporator AQ-100/120A for the cogeneration plant of Viscofan, world leader in artificial casings. Navarra - Spain

- INDUSTRIAL PLANT OF FOUNDRY IN THE BASQUE COUNTRY

Evaporator AQ-COG-5000 available in Ampo industrial plant, international leader in stainless steel and high alloy casting components, and valves of high technological value

- INDUSTRIAL PLANT OF OLIVE OIL

AQ-100/120A evaporators in the Sierra Sur Group cogeneration plant located in Granada, a pioneer in the field of olive oil production.

- CONTAINERIZED PLANT FOR THE PHILIPPINES

Complete desalination plant by reverse osmosis, model AQE-30D, arranged in a 20-foot container, including chlorination system, mineralization, pH control and CIP cleaning.

- FRESH WATER SUPPLY IN CÍES ISLANDS (PONTEVEDRA)

Reverse osmosis plants to supply water consumption in places where the availability of fresh water is minimal, as in the case of islands.

- VILLA SUR COMPLEX – LIMA (PERÚ)

Reverse Osmosis desalination plant for the supply of 50 tons per day of drinking water in the Country Club of Villa Sur of the district of Asia, Peru.

- HOTEL LE MORNE – MAURICE ISLAND

Drinking water treatment plant for RIU hotel complex of 500 tons per day with pre-treatment and post-treatment to obtain drinking water from seawater.

- HOTEL IN JAMAICA (ONGOING BUILDING)

Gefico is in the middle of the manufacturing phase of a seawater desalination and treatment plant for a five-star complex currently under construction, located on the beachfront. Located 30 minutes from the Montego Bay airport in Jamaica, the resort will be comprised of two hotels with joint capacity close to 1,000 rooms. Gefico will provide a complete treatment plant of 1,800 tons/day of capacity, to supply potable and technical water to the main services of the hotel, which will have large swimming pools, water park, casino, theater, nautical center and Spa Center, among others magnificent facilities.

CERTIFICATIONS

CUSTOMERS

COUNTRY CLUB DE VILLA

RIU Hotels & Resorts

PESCANOVA

AMPO

Stolt Sea Farm, S.A.
Grupo Stolt Nielsen

FANDICOSTA

Viscofan

PULEVA

JEALSA

COLLABORATORS

UNIVERSIDADE DA CORUÑA

USC UNIVERSIDADE DE SANTIAGO DE COMPOSTELA

UNIVERSITAT DE BARCELONA

CMA

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AWARDS

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Co-financed by the European Commission

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Gefico

Excellence in water