# Fresh water from the ocean

## Desalination plants open up a promising business area for Georg Fischer

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**Fresh water is increasingly scarce. State-of-the-art seawater desalination plants provide the answer. Environmentally friendly desalination technologies, in particular reverse osmosis, have the best prospects for development. Georg Fischer is in pole position in this segment. Thanks to innovative membrane technology.**

The performance is impressive: Africa's largest seawater desalination plant, located in Hamma, Algeria, produces 200,000 cubic metres (53 million gallons) of high-quality drinking water day after day. "That's one quarter of Algeria's total drinking water requirements," says Maurizio Pedrini, the Georg Fischer product manager responsible for the Mediterranean Basin and for the products delivered by GF Piping Systems to the Algerian seawater desalination plant. Not only are the size and capacity of the plant impressive, its energy footprint – which is due to the reverse osmosis technology it uses – is also an achievement. "The newest reverse osmosis production units can consume up to 20 percent less energy than classical distillation techniques," explains Pedrini. That means cheaper production of drinking water. The cost of producing one cubic metre of fresh water for the latest seawater reverse osmosis production units is estimated at around US$ 0.50.

### Greater use of plastic solutions

Reverse osmosis is a natural method of seawater desalination in which water is pumped at high pressure through a membrane that acts as a filter. Only absolutely pure water passes through the membrane, and even bacteria and viruses are held back. Thanks to new membrane technology, desalination plants can now be operated at lower pressures, making it possible to use plastic solutions for the piping components. The plastic piping, which is currently experiencing a veritable boom, is adjusted to the plant's precise specifications.
With its corrosion-free, fully plastic pipes, Georg Fischer has the edge over the competition in equipping seawater desalination plants. Over longer periods of use, salt water corrodes metal piping; plastic piping systems, however, are corrosion-free. Moreover, the flush-fitting piping joints guarantee reliable operation for a long life of at least 25 years.

### Reverse osmosis leads the league

Seawater desalination is increasingly important for overcoming the problems of drought and water scarcity that plague many countries. The oceans, after all, contain huge water reserves that can be converted into drinking water by means of desalination and purification. Experts claim that, of all the desalination techniques, natural technologies have the best prospects for the future especially when combined with renewable sources of energy (solar, wind). Two widespread methods are distillation and reverse osmosis. Reverse osmosis is cheaper than distillation and has a number of other practical advantages, for instance continuous water production. What's more, the engineering in reverse osmosis is simpler so that there is significantly less capital investment required for new plants, and simpler operating conditions mean fewer breakdowns. Reverse osmosis is already being employed in more than half of all seawater desalination and purification plants worldwide. And more are on the way – together with the high-performance piping systems "made by GF".

The bottom line

## A worldwide challenge

"The growing scarcity of drinking water has long been a challenge for the entire world and not just for Africa and Asia. Seawater desalination is an effective and inexpensive solution to this problem. Georg Fischer is proud to support the triumph of desalination plants with its corrosion-free piping systems."

*Jean-Pierre Petit, Head, Water Treatment Market Segment at GF Piping Systems*

Desalination boom

## Steep drop in production costs

**Not more expensive than conventional treatment**

In recent years, water desalination has taken a huge leap forward, mainly because of the steep drop in production costs and the use of state-of-the-art technology. Reverse osmosis plants now produce at costs that are three to four times lower than just thirty years ago. With production costs of less than US$ 1 per cubic metre of water, a price level has been reached that in some regions is not more expensive than that for conventionally treated water.

**Capacity to double within ten years**

According to a study carried out by a German desalination organisation, Deutsche Meerwasser-Entsalzung e.V., desalination plants with a daily capacity of 70 million cubic metres were in operation worldwide at the end of 2007. Of this total, reverse osmosis accounted for 42 million cubic metres.

**The big players**

Numerous new desalination plants are being built or are coming on stream the world over. Saudi Arabia alone had plants with a total daily capacity of over 4.5 million cubic metres under construction or in planning at the beginning of 2005 and an investment in water production of € 6 billion by 2015. The figures for the United Arab Emirates were of the same order of magnitude at that time (€ 4.5 billion by 2015). The USA is also among the big players, with major projects of almost 3 million cubic metres a day (as of the beginning of 2005).

Membrane filtration

## GF Piping Systems provides plastic solutions for reverse osmosis

**What counts: New membrane technologies …**

Progress in membrane technology is contributing to the dynamic growth in demand for reverse osmosis desalination plants. It is now possible to operate such plants at pressures of less than 16 bar, for which Georg Fischer offers PVC-U and PE materials. For lower pressures, the Progef Plus system is ideal. This plastic is very suitable for applications that require high levels of biological purity. Membrane technology is also economically competitive since the desalination process is cheaper thanks to higher demand. Owing to its many advantages, membrane filtration is the most widely used technology in water treatment.

**… and homogeneous connections …**

It is extremely important that in the design of desalination plants the right choice of materials and products is made for the system. GF Piping Systems thus manufactures all piping components in the plastic required so as to guarantee homogeneous, flush-fitting joints.

**… plus a convincing total cost of ownership**

The total cost of ownership of plastic piping systems is an economically attractive proposition. As a system supplier, GF Piping Systems offers complete solutions from a single source. This guarantees lower costs for design, installation, start-up and maintenance.

«Adding Quality to People's Lives»

## Making a valuable resource drinkable

**Desalination eases drinking water scarcity**

With modern plastic solutions and efficient water treatment technology, Georg Fischer plays a key role in producing high-quality drinking water from the oceans' huge reserves. In this way it makes a significant contribution to improving the quality of life for many people.

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