

SolarWatertreatment System

The HelioTech SolarWatertreatment System: the easiest way to desalinate seawater.

Supplying populations with drinking water is a global problem. Although inexhaustible water resources are available worldwide - 97.5% of the total water surface of the earth is sea water - and numerous desalination systems are emerging, about 25% of the world's population lacks potable water. Due to economic reasons, large, industrial-scale water treatment plants are only built near densely populated and coastal cities and areas. In more sparsely settled regions with no electricity and inadequate infrastructure, obtaining drinking water is and will increasingly become a struggle for survival for millions of people.

According to UN statistics, over 5 million persons, primarily children, die from diseases caused by contaminated water every year.

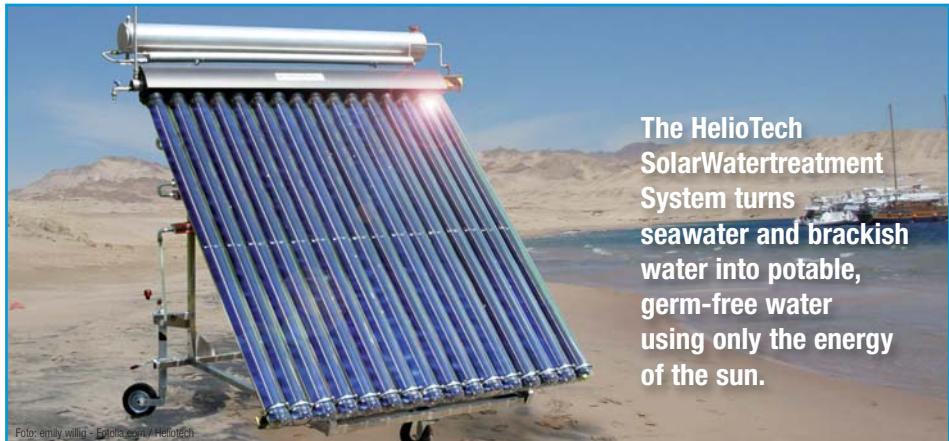
The advantages of the HelioTech system: drinking water for everyone, everywhere.

The HelioTech system is completely independent of all electricity and energy sources (waste heat, heating power plant, etc.). All the HelioTech SolarWatertreatment System needs is sunlight. And there is more than enough in those regions where drinking water is scarce: Southern Europe, South America and Southern Africa, Asia and Australia.

The HelioTech system can be used wherever seawater is available – and thus primarily in those countries and coastal regions that lack the required infrastructure, such as energy or roads to transport drinking water.

The HelioTech system is the ideal solution for decentralized local or regional use precisely where drinking water is needed, enabling settlements, hotels and resort complexes to secure their drinking-water supply reliably and cost-effectively.

The HelioTech system is the universally affordable water supply system. Purchase costs are extremely low, operating costs virtually nothing, and care and maintenance require very little in the way of staff or financial resources.



**"The global water
shortage is a greater
threat to humanity
than global warming,"
says one UN expert.
"The consequences
are being felt directly
right now, and not in
a hundred years."**



The problems of the reverse osmosis principle of industrial-scale plants: energy, environment, costs.

Seawater desalination using reverse osmosis, as it is practiced in most large-scale plants, requires gigantic expenditures for energy, design, material, operation, maintenance, personnel and investment. Investment costs of € 650,000 to € 2 mn and more are common. It takes about 4 kWh of power to desalinate 1000 liters of water. This requires power plants with a monthly output in the medium megawatt range. The water must additionally be chemically treated, distribution organized and constant, dependable operation

ensured. Not to mention the environmental problems caused by industrial-scale plants in coastal areas. At an efficiency of 25%, the salt filtered out is returned to the sea as brine, with the disastrous consequence that the elevated salt content contaminates entire coastlines and causes sustained damage to plants and animals, which cannot tolerate more than 3% salt concentration. This in turn means that the people of the region are often deprived of fishing as a livelihood. These people "flee" to the cities, which grow and grow. And the demand for water mushrooms accordingly.

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**The “water works” for everyone, everywhere:
using the principles of nature and the energy of the sun.**

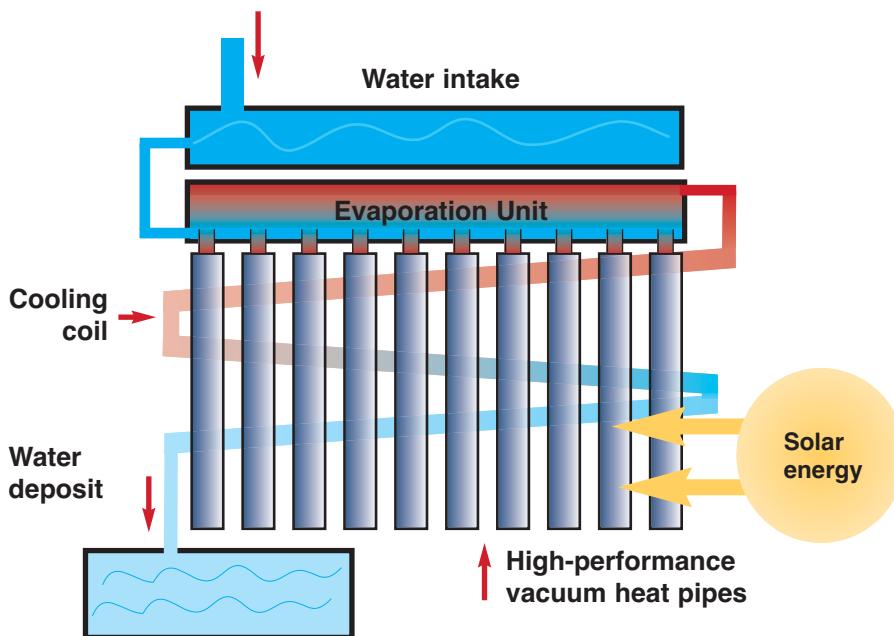
The HelioTech SolarWatertreatment System is the only solar-powered system that works solely by evaporation. This means that the water gained at an evaporation temperature of approx. 100 degrees C is absolutely germ-free and immediately drinkable. Unlike other processes, no post-treatment using chemicals or radiation is necessary.

Thus, everyone can now create as much drinking water as they need.

Nature's principle: evaporation.

The ingeniously simple HelioTech solution uses the principle of nature: seawater or brackish water is continuously fed to the evaporator unit from a water intake and heated to over 100 degrees by high-performance vacuum heat pipes. The water condensed in this way is germ-free, and is cooled by cooling elements on its way to the drinking water deposit.

Patent for the HelioTech SolarWatertreatment System has been applied for.



Features at a glance:

- Solar-powered, independent of all electricity sources
- Clean, potable water immediately, without chemical post-treatment
- Independent of location with unlimited potential applications
- Module output approx. 50 liters/day
- Scalable up to 30 m³/month by combining modules
- Simple technology – no specialists required for operation or maintenance
- Reliable and maintenance-free for decades
- Low investment costs thanks to proven materials
- Mobile, transportable design

Drinking water when it's needed: from 50 liters/day to 1800 cubic meters/year.



HelioTech makes drinking water affordable for everyone.

The HelioTech system is currently the simplest and most economical way to turn seawater into potable water. Low purchase costs, no energy costs, no follow-up costs, no maintenance expenses and long equipment service life enable drinking water at a price everyone can afford.

Reverse osmosis plants by contrast are only economical starting from a capacity of 1000 m³ per day – if they can be economically operated at all. After all, investment in the millions is just the beginning. Follow-up costs are enormous. The energy consumption alone of a small RO plant for 1000 m³ of water per day is 120 million watt per month – 120 megawatts! A huge waste of energy and money.

Obviously, such plants cannot be built everywhere. Certainly not where the necessary infrastructure, e.g. transport and pipeline systems, is lacking.

The HelioTech SolarWatertreatment System on the other hand can be used anywhere. Sun and seawater are the only inputs required.

Scalable output as needed:

7500, 15 000 or 150 000 liters per month.

A HelioTech SolarWatertreatment System has a capacity of 50 liters per day. When 10 modules are linked together, the total output is 15000 liters of drinking water per month: enough to meet the water needs of a lot of people - a farm, an entire village, a hotel or vacation resort complex. The transportable HelioTech system can additionally supply drinking water in disaster areas, as it also converts brackish water into germ-free drinking water.

With the HelioTech SolarWatertreatment System, decentralized, local drinking-water supply is possible anywhere.

The water analysis proves „Absolute drinking-water quality“.

The result of a water analysis* performed by the globally highly regarded Research Center for Brewery and Food Quality of the Munich Technical University in Weihenstephan affirms:



**Desalination using the
HelioTech SolarWatertreatment
System reduced the seawater salt
content of 21 700 mg salt per liter
of water to 8.1 mg salt per liter.**

**This simply distilled, germ-free
water thus has the same quality as
natural mineral water**

* of a water sample taken in the
Mediterranean



**50 liters of drinking water per
module. Millions of people have
less than 10 liters per day.**

According to the UN, each person requires a minimum of 50 liters of water per day. In the industrial nations, consumption is as high as 500 to 800 liters per day! People in many developing nations must survive on less than 10 liters if potable water is available at all.

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Mobile modules. Compact design. Proven materials.

The HelioTech SolarWatertreatment System is specially designed for the requirements of specific sites. One of the primary design criteria is ease of use: no specialists or expertise knowledge are necessary to operate this system properly. A brief training is all that is needed.

Compact design – just 2.20 meter wide, 2.00 meter high and 1.90 meter deep – this means that the system can easily be transported to a site by using any off-road vehicle, either fully assembled or as modules ready for assembly. The module can be placed on any firm surface. A height adjustment mechanism allows the system to be flexible to adjust to the seasonal altitudes of the sun as well as drain off the valuable salt residues.

The system's mobility and flexibility make it ideal for use at changing sites.



Only materials that are weatherproof and proven resistant to boiling salt water are being used. For example, the high-performance vacuum heat pipes, proven in actual use a million times over, are produced by the world's leading manufacturer, and are absolutely low-wear and low-maintenance. All design details are configured so that virtually no maintenance is required. The outstanding characteristics of the HelioTech SolarWatertreatment System are a long service life, reliability and economic operation.

Data and facts compared			
Operation	Process principle: Energy medium: Pressure: Energy source/requirement: Pretreatment: Post-treatment: Efficiency:	Evaporation Solar - Solar energy no no 100 %	High pressure Electricity and/or steam 60 bar Electricity or waste heat Yes, required Yes, required 25 %
Design	Dimensions (WxHxD): Construction: Maintenance:	2200 x 2000 x 1900 mm Modular Low requirement	Large space requirement Large-scale plant technology High requirement, complex
Deployment	Location: Use: Scalability: Infrastructure:	Any location with sunlight/ access to water Drinking water supply, decentralized, regional, local Yes, through modular design None required	Power plant, electricity required Drinking water and irrigation Plants not expandable Essential
Investment and costs	Purchase price: Operating costs:	From € 4600 per module Minimal	Approx. 800 k – 1.5 mn Approx. € 4 – € 10/m³
Output	Water output/capacity: Water quality:	From 50 to 5000 liters/day 100% drinking water quality, germ-free, immed. drinkable	From min. 1000 m³/day 95% drinking water quality, post-treatment required
Environmental impact	Environment & health: Toxic waste	No effects None	Salinization of coastal areas Chemical additives