

## MEH - Systems

### About DWC:

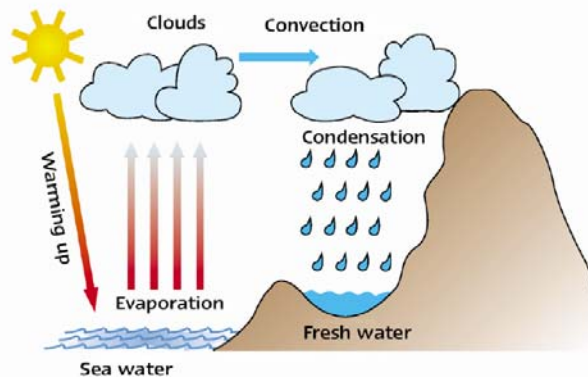
DecRen Water Consult is consulting its clients in all aspects of an integrated and renewable based water supply and waste water management. By using decentralized, appropriate and renewable powered technologies we can ensure cost effective and individual solutions from a single source. Therefore the following product is an attractive product alternative.

### Requirements

In the area of desalination of brackish or salt water there seems to be a number of technologies available. May it be decentralized and off grid systems for the water supply in the farming sector or for gardening, for the supply of smaller communities or for tourist resorts and hotels. Energy autonomous, technology appropriate and very robust desalination systems are extremely important. Therefore those systems should be scalable and should be powered by solar energies or/and with any other heat source.

### Working principle of (MEH) Multi-Effect-Humidification

The MEH System is based on a natural principle. The sun heats up surface water, the water evaporates. is rising and condenses in cooler air and raining down again. The produced steam is completely clear and does not carry any harmful products, bacteria or any other solvents. It is pure distilled water.



### Facts about the MEH Process

- Low temperature of 85°C is used for evaporation
- Energy recovery by natural convection
- No pretreatment of raw water
- Variable salt content in raw water
- Modular set up of 1/5/10m<sup>3</sup>/d water production
- Energy requirement ca. 120kWh/m<sup>3</sup>
- Water production ca. 25l/m<sup>2</sup>/d

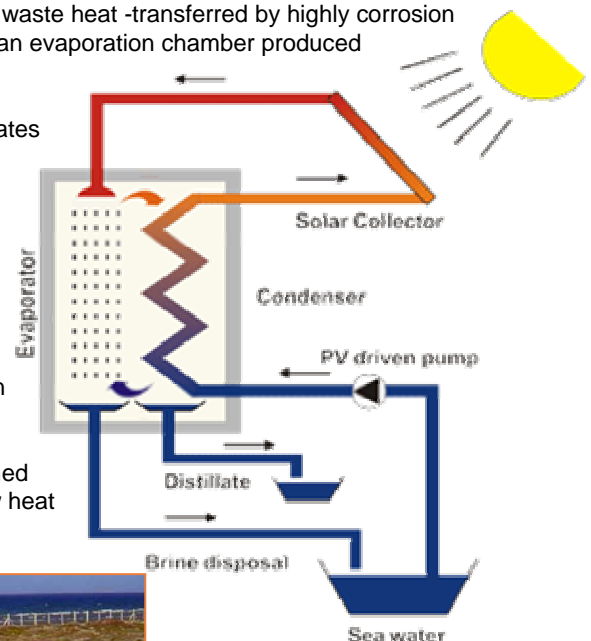
### Contact

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### Multi-Effect-Humidification (MEH) System

Sea water is heated by the sun or by waste heat -transferred by highly corrosion protected heat exchangers. It enters an evaporation chamber produced from corrosion free materials – very important for reliable long term operation. Here the seawater evaporates from efficient antibacterial fleece surfaces. The produced steam is transported to the condenser in a second step –completely without any additional energy demand. Like in nature, natural convection enables the best performance in the water production process -optimized by the well engineered geometric collocation of surfaces within the module. During condensation, the main part of the energy used for evaporation is regained applying materials with extremely low heat flux resistance.



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Picture: 5m<sup>3</sup> system with 140m<sup>2</sup> Flat collectors in Jeddah, Saudi Arabia



Picture: Container with 10m<sup>3</sup> locally produced warm water storage tank 80°C, for 22 hour water production



Picture: Condensation within the container

All desalination modules are pre installed in containers and include the patented, clever designed arrangement of corrosion free condensation and evaporation subunits enhancing best energy recovery ratios. All components in contact with salt water are made from corrosion free materials. Condenser / Evaporator are made of taste-free, beverage-conform PolyPropylene material. Casing of the humidification chamber and collection basins are made of highly graded stainless steel.

### Application:

#### **Drinking water supply**

- in rural communities
- Tourism, Military, farms

#### **Farming**

- Irrigation
- Cattle, etc

<u>Configuration/System components</u>	MiniSal	MidiSal	MegaSal
Water production L/Tag (max)	1.000	5.000	10.000
Container size	5'	20' CSC	40' CSC
Size in Meters	2,44 x 2,35	2,44 x 6,06	2,44 x 12,19
Transport weight kg	480	5.300	9.800
Operational weight kg ca.	650	6.100	11.400
Required thermal collector space (ca.)	40m <sup>2</sup>	175m <sup>2</sup>	350m <sup>2</sup>
Required total space for collectors (ca.)	60m <sup>2</sup>	250m <sup>2</sup>	500m <sup>2</sup>
PV requirement for pumps (kW peak)	1,5	3,5	5,5

### Water quality produced

Salinity drinking water (TDS)	< 50ppm
Conductivity (Drinking water)	< 20µS/cm
Temperature (Drinking water)	max 40°C
Temperature (Brine)	max 45°C
Max. bacteria in drinking water (36°)	< 30/ml (directly after production)

*Additional UV-Sterilization or mineralization optional available*

### Summary of benefits:

- No chemical pretreatment of raw water
- High quality materials
- No moving parts in the desalination process
- Low maintenance (every 2 years)
- Low energy demand (renewable)
- Runs with different heats sources
- Constant high quality of drinking water
- Successful track record over many years
- Visit in Jeddah possible at any time
- Low investment costs, hardly any running costs
- Container pre installed for quick set up
- Scalable with identical and standardized components

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*This product is in our view one attractive possibility to ensure a sustainable and renewable based water supply and waste water management. If this product is however applicable for your personal circumstances or in combination with other products or processes should be examined prior to its installation. Although we take extreme care of all data and information in this document we cannot be held responsible for any changes, omissions or errors.*