

UNUS-UWP



C-MEM Zero



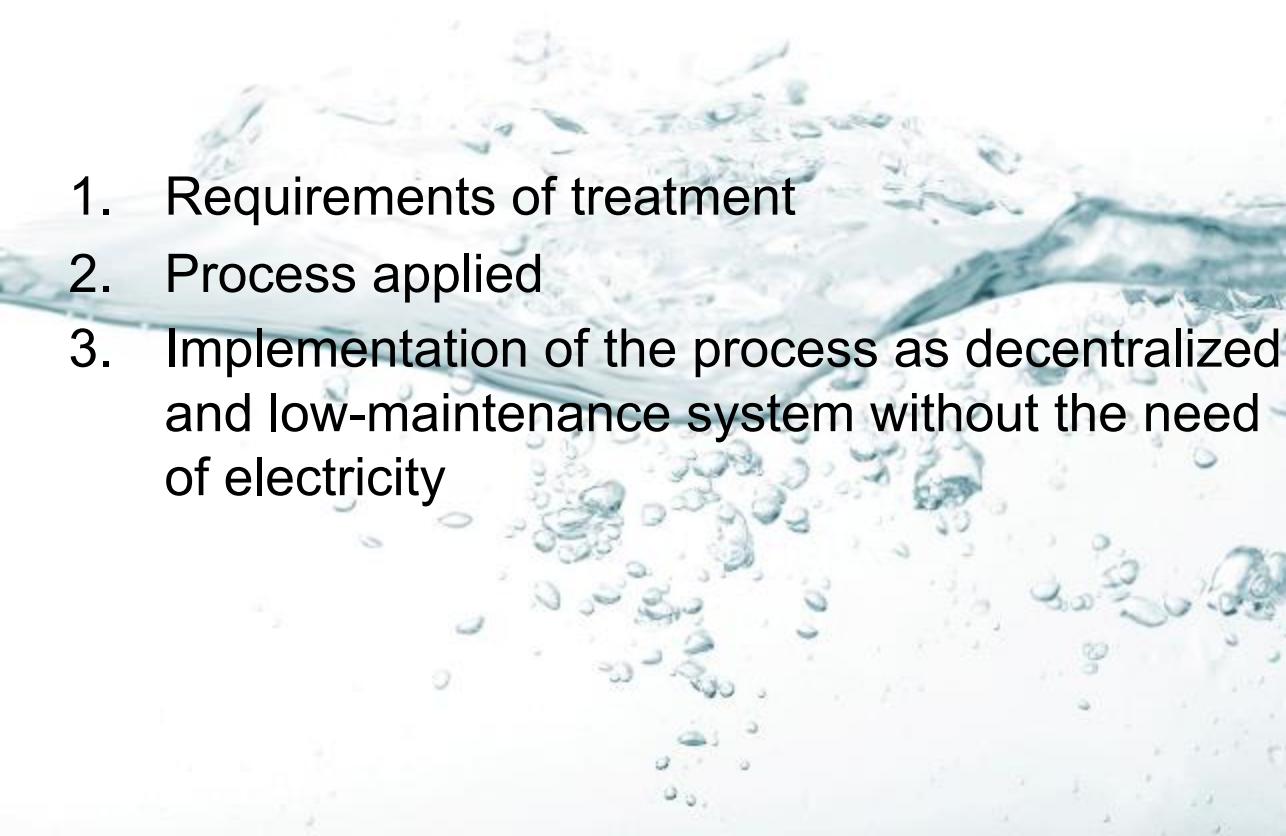
Ultrafiltration Technology
for
Drinking Water Treatment
without the Need of Electricity



CONTENTS

Focus: microbiological contamination of drinking water

= the main reason for „unsafe“ water in the sense of the
Drinking Water Directive



1. Requirements of treatment
2. Process applied
3. Implementation of the process as decentralized and low-maintenance system without the need of electricity

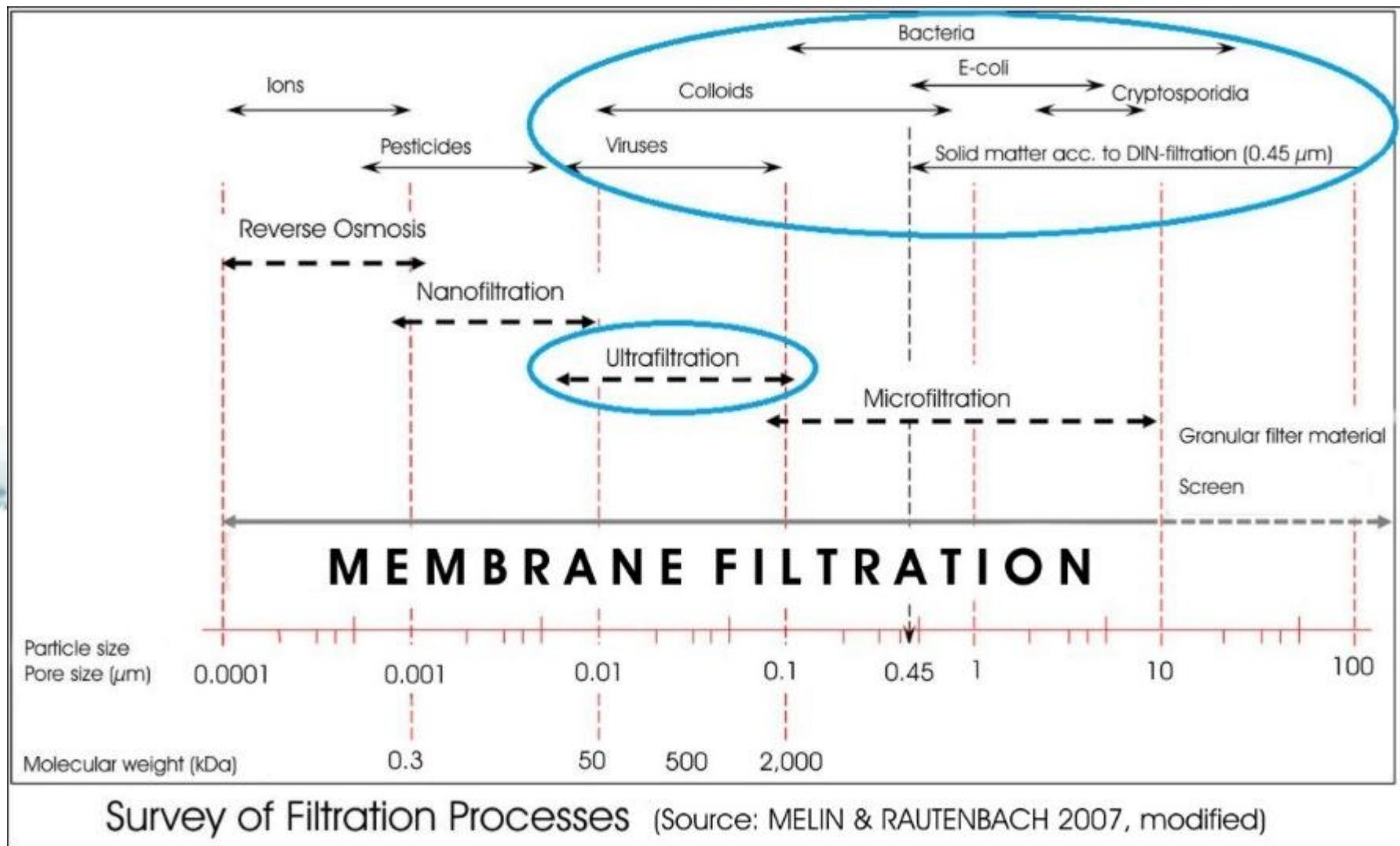


WHO requests concerning microbiological elimination performance*

Target	Log ₁₀ Reduction: Bacteria	Log ₁₀ Reduction: Viruses	Log ₁₀ Reduction: Protozoa
Highly protective <input checked="" type="checkbox"/>	≥ 4	≥ 5	≥ 4
Protective	≥ 2	≥ 3	≥ 2
Interim	Achieves „protective“ target for two classes of pathogens and results in health gains		

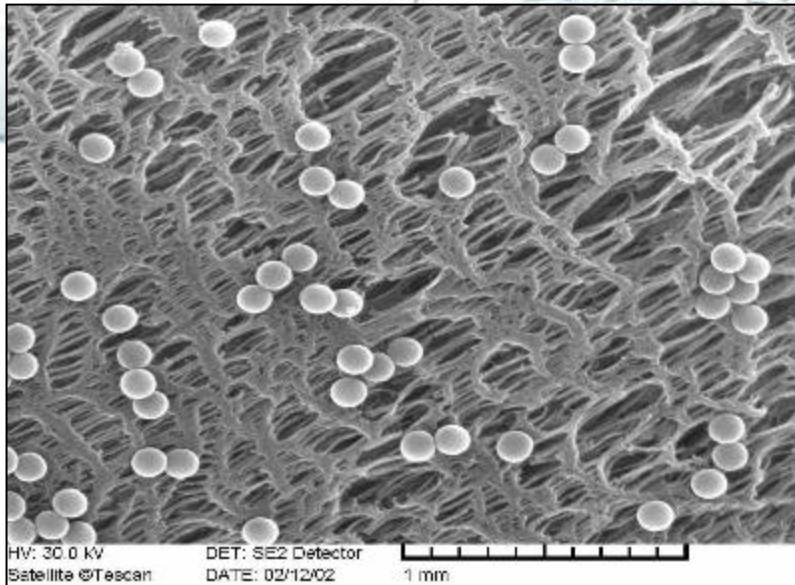
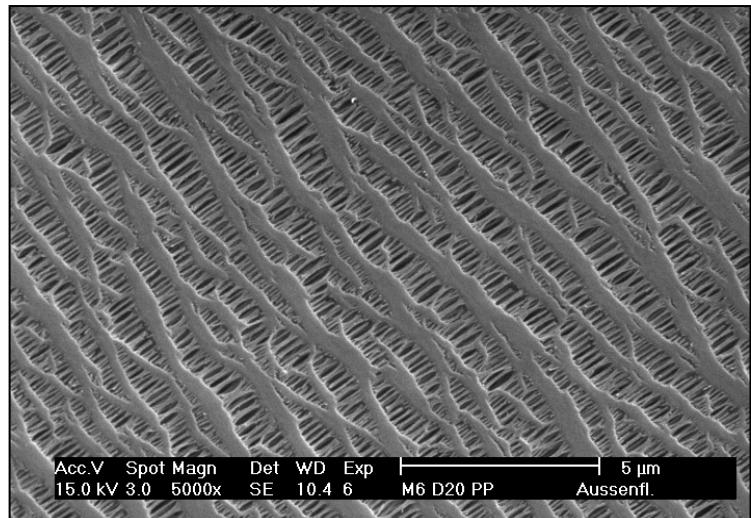
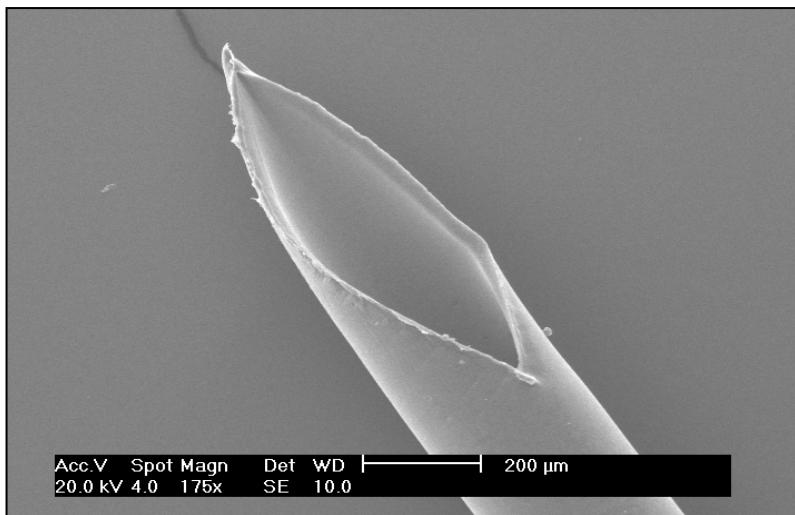
* 2011 WHO report *“Evaluating household water treatment options: Health-based targets and microbiological performance specifications”* by applying the GDWQ concept of the tolerable burden of disease as an upper limit of 10⁻⁶ disability-adjusted life year (DALY) per person per year

ULTRAFILTRATION



C-MEM ULTRAFILTRATION

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Hollow fibre ultrafiltration

- porous HDPE hollow fibres
- Ø 0.3 – 0.5 mm
- pore size: 20.1 nm
- 3D – pore structure
- hydrophilic
- anti-fouling coating

Microbiological Performance

5 Log reduction prevents disease transmission:

diarrheal diseases, cholera, dysentery, typhus, cryptosporidium enteritis, cyclosporiasis, gastroenteritis, giardiasis, hepatitis E

Chemical / Physical Performance

Removes suspended solids/turbidity:

suspended solids: ≥ 5 LVR

turbidity: ≥ 5 LVR

Examples of Application

- rivers
- lakes
- rain water
- wells
- water springs
- stored water

Limits of Application:

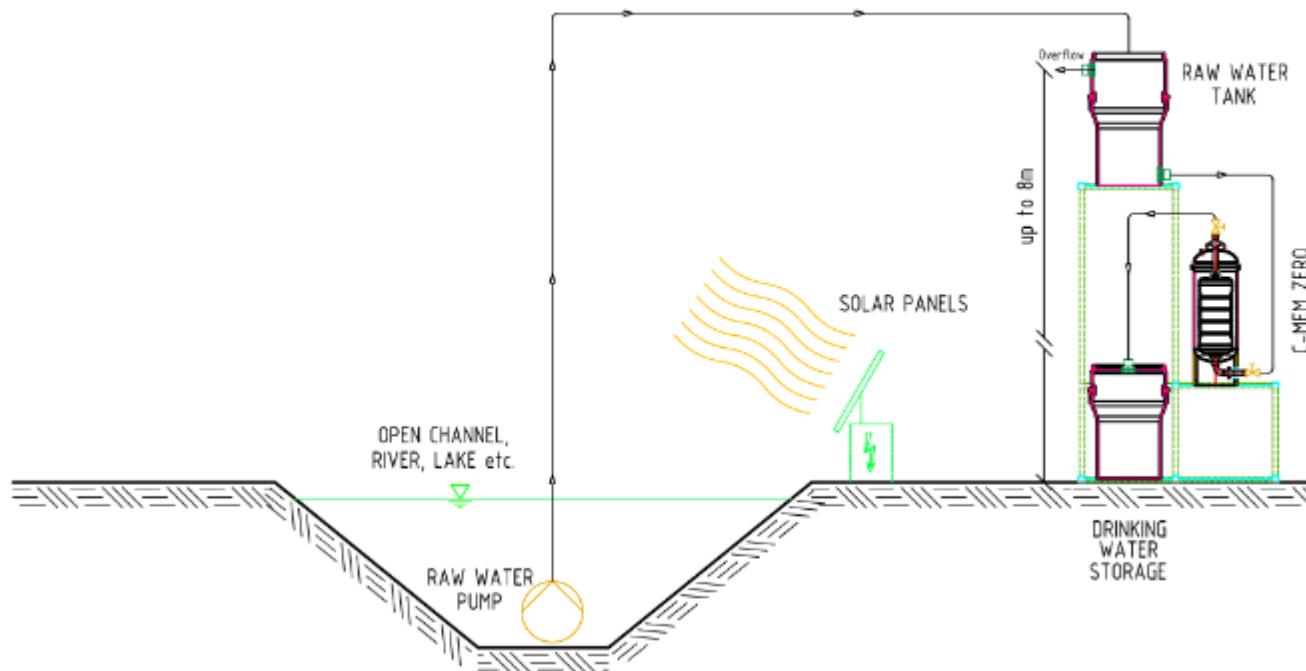
The removal of dissolved substances requires further treatment steps.

Application



Application

Feeding of raw water tank by solar powered pump

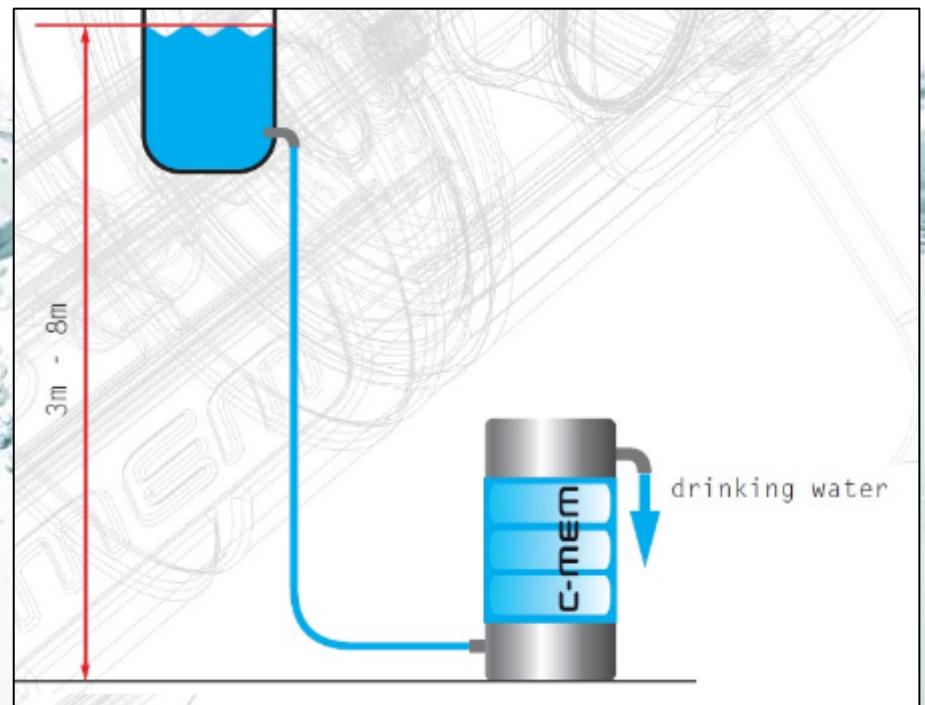


C-MEM CARTRIDGES



Overcoming of the membrane resistance by hydrostatic pressure (“water column”)

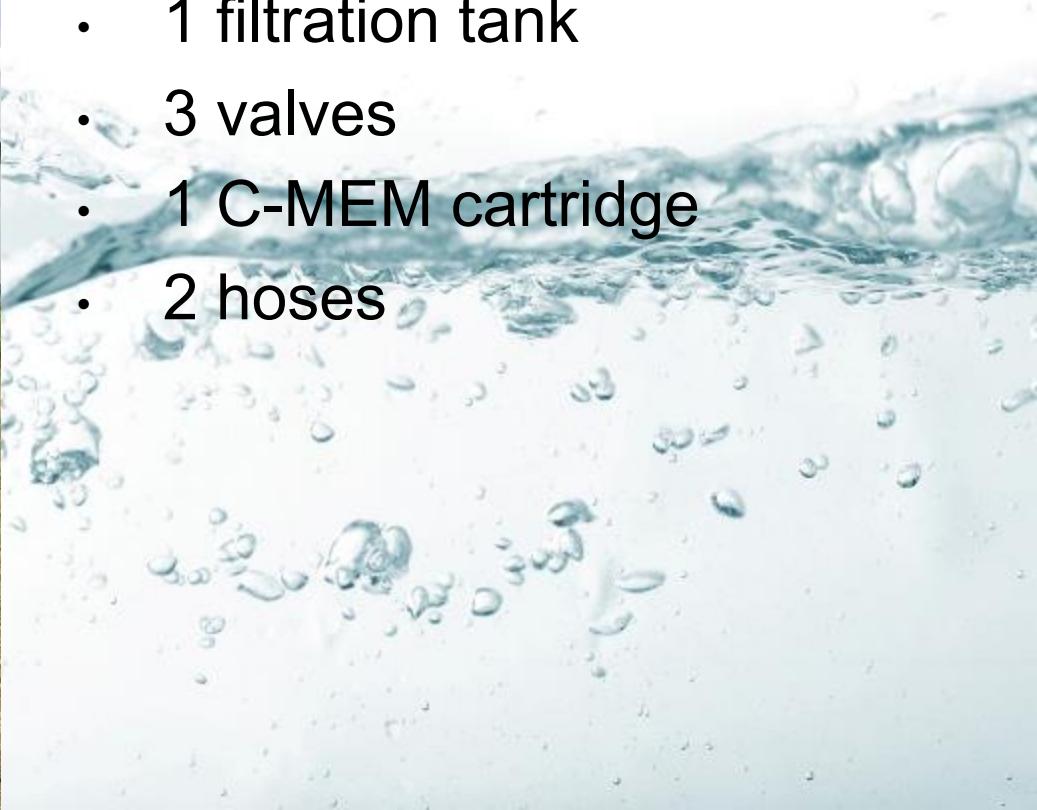
- 6 m² membrane surface
- Flux: 30 - 360 l/h
- Pressure: 0.1 to 0.8 bar



C-MEM ZERO EQUIPMENT COMPONENTS



- 1 raw water tank
- 1 filtration tank
- 3 valves
- 1 C-MEM cartridge
- 2 hoses



C-MEM ZERO PERFORMANCE

30 – 360 l/h per unit at app. 1 to 8 m water column

1) Operation with regular cleaning: (30-360 l/h)

- (chemical) cleaning after performance drop
- flux after cleaning $75-100 \text{ l/m}^2 \cdot \text{h} \cdot \text{bar}$
- $\Rightarrow 85 \text{ l/m}^2 \cdot \text{h} \cdot \text{bar} \times 0.15 \text{ bar} \times 6 \text{ m}^2 = \text{ca. } 76.5 \text{ l/h}$

2) Operation without regular cleaning: (30-60 l/h)

- flux stabilizes after 1-2 months in the range of $5-10 \text{ l/m}^2 \cdot \text{h}$. Pressure independent!
- $7.5 \text{ l/m}^2 \cdot \text{h}$ results in $7.5 \text{ l/m}^2 \cdot \text{h} \times 6 \text{ m}^2 = 45 \text{ l/h}$

ADVANTAGES

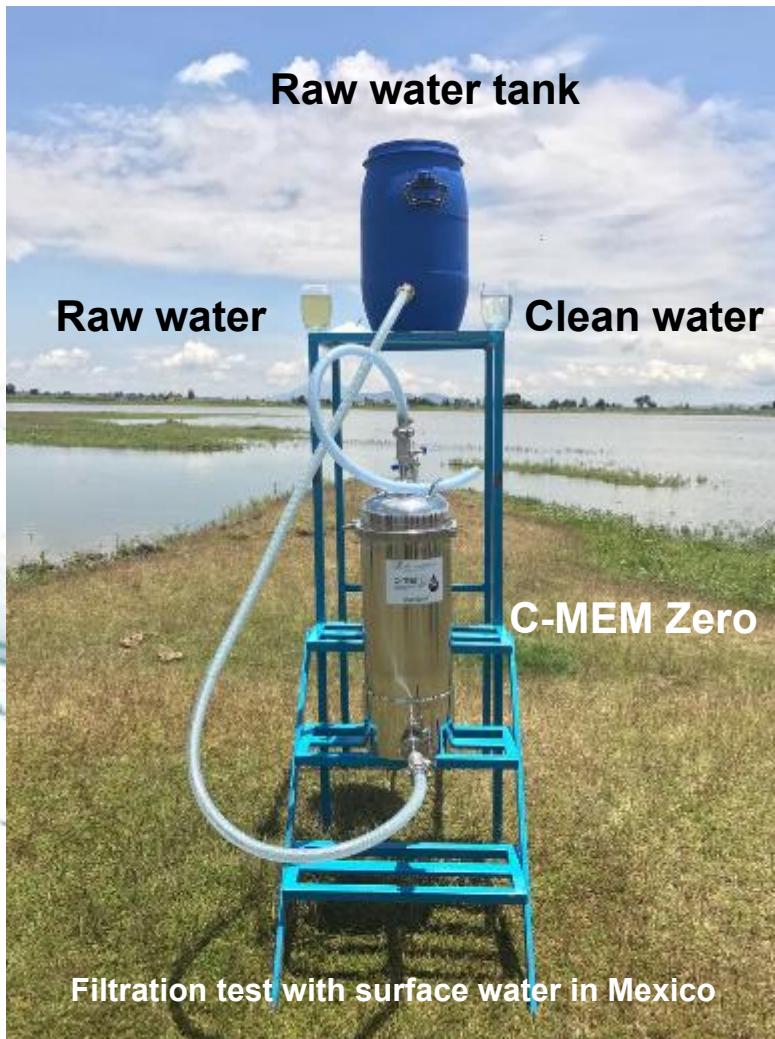
- no electrical energy required
- no mechanical parts, pumps etc.
- light – ca. 16 kg per unit
- removal of suspended solids, turbidity, pathogenic bacteria, virus, worm eggs



C-MEM ZERO

- Production of 30 - 360 liters of drinking water per hour and skid at 1 - 8 m head
- Life time of membrane up to 10 years
- Easy cleaning
- Only membranes must be replaced after a certain time. The cartridge will be reused.
- Cheap solution for applications where no electricity is available

C-MEM ZERO



~~Electrical Energy~~
~~Chemicals~~
~~Moving Parts~~





**For more information
please visit our webpage**

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