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**February 14, 2013**
**Meidensha Corporation**

# Large-diameter ceramic monolith membrane developed and utilized for production of drinking water and reuse of wastewater

**--Largest diameter in the world ( $\phi$ 230 mm, 1.5m, membrane area 36 $m^2$)--**

MEIDENSHA CORPORATION (President: Junzo Inamura,), hereafter referred to as MEIDEN, has developed a large-diameter ceramic monolith membrane for the production of drinking water and reuse of wastewater. The product will be launched in fiscal 2013.

MEIDEN has been selling ceramic flat sheets for the reuse of sewage and wastewater since 2010. In addition to this, MEIDEN has developed a large-diameter ceramic monolith membrane that allows higher pressure filtration for the production of drinking water and reuse of wastewater.

In Japan, membrane filtration is becoming popular as a reliable method to remove chlorine-resistant protozoa such as cryptosporidium. In addition, throughout the world, water demand has been increasing along with population growth, economic expansion, and urbanization, meaning technologies for the reuse of sewage and wastewater are attracting attention from the viewpoint of effective utilization of water resources.

Ceramic monolith membranes realize stable filtration at a high flux[1] level and contribute to energy saving with their low trans-membrane pressure difference. In comparison with organic membranes, a ceramic monolith membrane has a longer life, higher chemical resistance, and better operability at high pressure, contributing to stable, long-term operation.

Ceramic monolith membranes are best used in the production of drinking water from underground or river surface water resources and water generation from the secondary effluent of sewage water; furthermore, there should also be various needs for ceramic monolith membranes in the pretreatment of seawater desalination using the RO method[2] and oil-water separation treatment.

MEIDEN plans to strengthen its sales not only in Japan but also overseas, particularly Asian countries, targeting sales of 10 billion yen in the membrane business including flat sheets and monolith membranes in fiscal 2015.

MEIDEN would like to contribute to solving the world's water problems and help with energy saving through the development and supply of its membrane filtration technology for drinking water, pretreatment technology for seawater desalination, and technology for wastewater reuse by using ceramic monolith membranes.

■ Characteristics of ceramic monolith membrane

(1) High flux level, space-saving

Stable filtration at a high flux level can be maintained. Its filtration performance is about twice that of ordinary organic membranes (depending on the water quality). It has a large membrane area and requires only a small space to install.

(2) High durability, long life

Ceramic material is highly durable and heat resistant relative to widely used organic membranes, and the membrane rarely gets damaged. It is also resistant to chemicals such as acid, alkali or oxidant. A ceramic monolith membrane can be washed at high pressure, which allows for easy cleaning of surface contamination and realizes easy maintenance. A long-life ceramic monolith membrane also contributes to the reduction of life cycle costs.

(3) Environment friendly

Ceramic monolith membrane systems can be operated at low power, which saves energy and reduces greenhouse gases. After use, membranes can be recycled into ceramic materials. Ceramic monolith membranes are thus considered eco-friendly.

Specifications of membrane element [3]

| Item | Specifications |
|---|---|
| Material | Ceramic (alumina) |
| Shape | Monolith structure |
| Outer diameter x length | $\phi$230 mm x 1,000 mm, $\phi$230 mm x 1,500 mm |
| Nominal pore size | 0.1 μm |
| Membrane area | 24 $m^2$, 36 $m^2$ |

Note 1) Flux: Volume of filtrated water per membrane area. Also called membrane flux.

Note 2) RO method: Filtrating seawater through RO (Reverse Osmosis) membranes to create plain water.

Note 3) Element: A ceramic membrane medium is inserted into a stainless steel case.

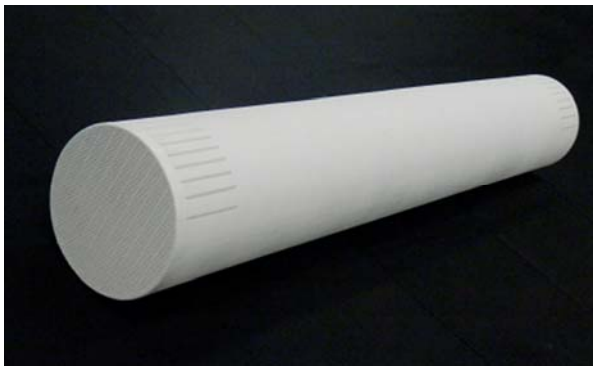

Fig. 1 External view of ceramic monolith membrane element

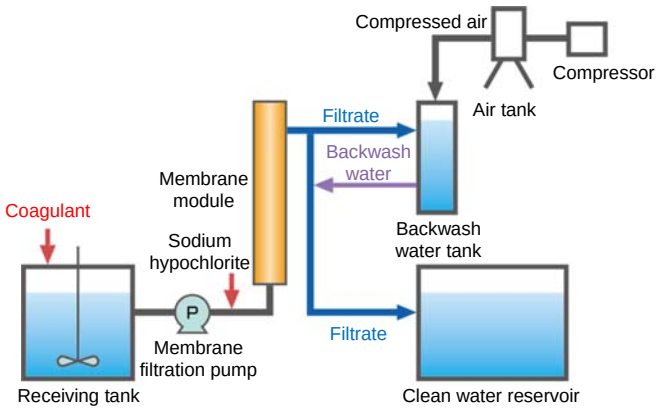


Fig. 2 Filtration and backwash flow through ceramic monolith membrane