

RO membranes for seawater desalination

Globally, water shortages are becoming an increasingly serious problem. We provide hollow fiber reverse osmosis (RO) membrane, which enables desalination to be performed with low energy consumption, to countries throughout the world, especially in regions where there is inadequate access to fresh water. By comparison with the conventional multi-stage flush (MSF) method, Toyobo's method using RO membrane makes it possible to achieve a substantial reduction in CO₂ emissions.

Toyobo's RO membrane is made mainly from biomass material, and it has a number of unique features, including long product lifespan of eight years or more, and being able to produce high-purity fresh water. Additionally, the superior chlorine resistance of the membrane material keeps maintenance costs down.

Going forward, we will be expanding production of RO membrane so that it can be used to meet the daily water needs of around 10 million people through seawater desalination (this is the target for Sustainable Vision 2030).

* The Biomass Mark is allowed to be labeled on products and materials containing a certain percentage of biomass after the composition, proportion, quality, and safety of the raw biomass is verified by a third-party organization composed of academic experts.



Seawater desalination plants



Biomass Mark* for our hollow fiber membrane in HOLLOSEP®

Avoided emissions (reduction of CO₂ emissions)

Approx. 9 million t-CO₂

Amount of fresh water produced

Approx. 900 million m³

Estimated value calculated by Toyobo based on the assumption that the RO membrane elements sold by Toyobo in fiscal 2022 are used for eight years.

VOC recovery equipment

Toyobo's VOC recovery equipment is used around the world to control emissions of volatile organic compounds (VOCs), which are feared to affect the atmosphere and human health.

Our VOC recovery equipment incorporates an innovative built-in activated carbon fiber K-FILTER®, which is used in various industries to recover dichloromethane used in the lithium battery separator manufacturing process, and to control emissions and recover ethyl acetate (which is used in dry lamination and adhesive processes), toluene, and IPA etc.

Our activated carbon fiber K-FILTER® has superior adsorption and desorption capabilities and contains less impurities than granular activated carbon, enabling high-quality solvent recovery and excellent energy efficiency. Our VOC recovery equipment can reduce carbon dioxide emissions by approximately 40 to 80% compared to conventional VOC combustion equipment when treating combustible VOCs such as ethyl acetate and toluene (according to research by Toyobo).

Going forward, to contribute toward the realization of the decarbonized society, we will expand applications of our VOC recovery equipment and sales promotion of our nitrogen desorption type VOC recovery equipment, which is more energy efficient.



VOC recovery equipment

VOC recovery amount (Dichloromethane)

Approx. 3 million tonnes

Estimated value, calculated by Toyobo, of the amount of VOCs (specifically, dichloromethane) that would be recovered if our VOC recovery equipment sold by Toyobo in fiscal 2022 is operated for 15 years.