

June 4, 2012
Toyobo Co., Ltd.

Toyobo's Reverse Osmosis(RO) Membranes for Seawater Desalination Selected for Use in the World's Largest Seawater Desalination Plants

Toyobo's HOLLOSEP® RO membrane elements for seawater desalination were chosen for use in the world's largest seawater desalination plants in Saudi Arabia. Also, to further expand seawater desalination business in the Middle East, Toyobo has begun the production of HOLLOSEP® elements in Saudi Arabia.

As a result, Toyobo is enhancing its competitive advantages in the seawater desalination business in the Middle East.

1. HOLLOSEP® Selected for the World's Largest Seawater Desalination Plants

Toyobo's HOLLOSEP® RO membrane elements have been selected for use at the Ras Al Khair Plant, which is located in the eastern part of Saudi Arabia on the Arabian Gulf. The Ras Al Khair Plant will be one of the largest seawater desalination plants in the world, with a capacity of 1,000,000m³ of freshwater per day. Of the total daily output of 1,000,000m³ of freshwater, 345,000m³ will be produced using the RO method and the remainder by multi-stage flush (MSF) method.

The owner of the plant is Saline Water Conversion Corporation (SWCC), of the Kingdom of Saudi Arabia, and Doosan Heavy Industries & Construction Co., Ltd. (of Korea) was awarded as the EPC contractor. The plant is scheduled to go into operation in 2014.

Since other large projects following Ras Al Khair are expected to select using the HOLLOSEP® membrane, Toyobo made investments to expand product capacity of its Iwakuni Membranes Plant (located in Iwakuni, Yamaguchi Prefecture) by more than 50%.

The HOLLOSEP® RO Membrane Elements for Seawater Desalination

RO membrane elements for seawater desalination are core components composed of hollow fibers that desalt seawater to freshwater. The modules, which consist of RO membrane elements in a pressure vessel, are used in seawater desalination plants. The elements make use of hollow fiber membranes made of cellulose triacetate, which has superior resistance to the chlorine sterilization chemicals that are used to prevent the growth of microorganisms. These

elements have been used successfully in many plants all over the world.



Toyobo's RO membrane element for seawater desalination

2. Production of HOLLOSEP® Elements Has Begun in Saudi Arabia

Toyobo has established a joint venture RO membrane element manufacturing plant in Saudi Arabia, together with Saudi Arabia's ACWA Holding (ACWA) and ITOCHU Corporation (Itochu), and it has begun production of HOLLOSEP® elements for seawater desalination.

(1) Opening Ceremony on May 22

The opening ceremony of the plant was held with the presence of His Excellency, Eng. Abdullah A. AL-Hussayen, Saudi Arabia's Minister of Water and Electricity, and Mr. Jun Yoshida, Consulate-General of Japan in Jeddah. The representatives of ACWA, Itochu and Toyobo, who included President Ryuzo Sakamoto, Director Kazuo Kurita, and a General Manager Nobuya Fujiwara, attended the ceremony.



(2) Outline of the Joint Venture

Company name: Arabian Japanese Membrane Company, LLC (AJMC)

Date of establishment: August 2010

Paid-in capital: Approximately ¥200 million (Total investment of approximately ¥700 million)

Ownership: ACWA: 49%, Toyobo: 36.1%, and Itochu: 14.9%

Location: Head Office and plant: Rabigh (in Rabigh Plus Tech Park)

Marketing & Sales Office: Riyadh

Lines of business: Manufacturing and sale of RO membrane elements for seawater desalination

(3) Further Development

Toyobo positions this newly formed joint venture as a strategic base for the expansion of its business in the seawater desalination market in the Middle East, where further expansion is expected in the future. AJMC expects expanding sales of RO membrane elements for seawater desalination not only in Saudi Arabia, but also in the rest of the Middle East and the North Africa region. The joint venture is aiming for annual sales of ¥1.5 billion in 2012 and ¥4.0 billion in 2015.

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Supplementary Information

Major Seawater Desalination Plants Employing HOLLOSEP® Modules

Plant Name (Country)	Plant Size	Start-up Date
Ras Al Khair (Saudi Arabia)	345,000 m ³ /day	2014
Jeddah R03 (Saudi Arabia)	260,000 m ³ /day	2013
Shuqaiq-II (Saudi Arabia)	240,000 m ³ /day	2010
Rabigh (Saudi Arabia)	218,000 m ³ /day	2008
Yanbu (Saudi Arabia)	128,000 m ³ /day	1998
Jubail (Saudi Arabia)	85,000 m ³ /day	2007
Jeddah R01 (Saudi Arabia)	56,800 m ³ /day	1989
Jeddah R02 (Saudi Arabia)	56,800 m ³ /day	1994
Marafiq-Yanbu (Saudi Arabia)	50,400 m ³ /day	2005
Fukuoka (Japan)	50,000 m ³ /day	2005
Ad Dur (Bahrain)	45,500 m ³ /day	2005
Florida (United States)	11,400 m ³ /day	2005
Tanjung Jati B (Indonesia)	10,800 m ³ /day	2005