

MEDIA RELEASE

For immediate release

PUB Singapore and MEIDEN SINGAPORE collaborate on first Ceramic Membrane MBR Demonstration Plant to treat and recycle industrial used water

Singapore, 2 July 2012:- PUB, Singapore's national water agency and MEIDEN SINGAPORE (MSL) announced today the signing of an agreement to establish the first Ceramic Membrane MBR Demonstration Plant in Singapore to treat and recycle industrial used water in a more energy-efficient and cost-effective manner.

MSL will also establish an R&D centre and assembly factory for ceramic membrane units in Singapore, as well as a facility for development, production and after-sales service in Asia. MSL will also be the regional Headquarter for water business in Asia.

The demonstration plant will be sited at the Jurong Water Reclamation Plant in Singapore and construction is expected to complete by August 2013. The one year demonstration study will focus on process optimization. The plant will be capable of treating one million gallon (i.e. 4,550 cubic meters) of industrial used water per day. The reclamation of high COD industrial used water has conventionally been considered difficult. This project aims to demonstrate the effectiveness of Meiden's used water processing system by combining the use of the Upflow Anaerobic Sludge Blanket (UASB) technology and Meiden's Ceramic Membrane MBR system in achieving energy savings and a consistent high-quality output of recycled water. The use of UASB, a biological process, can remove COD efficiently while the Ceramic Membrane MBR, which has a longer lifespan than conventional membranes, can produce a stable water supply for recycling purposes. Together, they can potentially result in more energy and cost savings in the treatment of industrial used water.

This collaboration stems from an MOU signed in 2010, following which MSL has been conducting verification tests for the Ceramic Membrane MBR system in PUB's Ulu Pandan Water Reclamation Plant. Following satisfactory test results from this test-bedding project, MSL is taking the research one step further by collaborating with PUB to construct a demonstration plant to reclaim industrial used water for recycling purposes.

For this project, MSL will be supported under the TechPioneer scheme, which is administered by Singapore's Environment and Water Industry Programme Office (EWI). The scheme aims to

commercialise new technologies by encouraging early adoption of these technologies by both the public and private sectors in their operations, and promoting environmental sustainability at the same time. The scheme helps local companies in Singapore to build a track record for these new technologies and expedite the commercialisation of such technologies in the environment and water sector.

Director of Cleantech at Singapore Economic Development Board, Mr Goh Chee Kiong commented, “We are pleased that Meidensha has partnered with Singapore to develop, demonstrate and manufacture its cutting edge membrane technology. This affirms Singapore’s position as a living laboratory where companies can conveniently develop, trial and commercialise sustainable solutions. Meidensha can also take advantage of Singapore’s vibrant water industry ecosystem in conducting business activities across the value chain.”

MOU between Yokohama City, Japan, PUB and Meidensha

Yokohama-city, JAPAN, PUB and Meidensha (parent company of MSL) also signed a Memorandum of Understanding today to collaborate on a used water treatment project using the anaerobic ammonium oxidizing process. Meidensha will build a pilot plant at the Changi Water Reclamation Plant in Singapore. This joint research looks into the removal of high-concentration nitrogen by an anaerobic treatment method using anaerobic ammonia-oxidizing bacteria.

Meidensha already has a pilot plant in Yokohama, Japan with Yokohama-City. Undertaking a similar research in Singapore allows Meidensha to better evaluate the system through a comparison of data collected from two sites with different conditions. Meiden will share the results obtained from these two plants, with an aim to improving and verifying the reliability of this treatment technology.

Meiden will feature these exhibits at Singapore International Water Week 2012 (SIWW 2012), which is held from 1st July to 5th July.

About MEIDEN SINGAPORE

Founded in 1975, Meiden Singapore is fully owned overseas subsidiary by Meidensha and has been manufacturing transformers and switchgears primarily for the Asian market.

The principle place of business is: 5 Jalan Pesawat Jurong Industrial Estate in Singapore.

The number of employee: 250 people. Capital: 25.4 million Singapore dollars. Annual Revenue of Fiscal Year 2011: 106 million Singapore dollars.

Home Page: <http://www.meidensg.com.sg/index.htm>

About PUB

PUB is a statutory board under the Ministry of the Environment and Water Resources. It is the water agency that manages Singapore's water supply, water catchment and used water in an integrated way.

About PUB's tagline: Water for All: Conserve, Value, Enjoy

PUB has ensured a diversified and sustainable supply of water for Singapore with the Four National Taps (local catchment water, imported water, NEWater, desalinated water).

To provide water for all, PUB calls on all to play our part to conserve water, keep our water catchments and waterways clean and build a relationship with water so we can enjoy our water resources. If we all play our part, we can have enough water for all our needs – for industry, for living, for life.

Home Page : <http://www.pub.gov.sg>

About Environment and Water Industry Programme Office

The Environment & Water Industry Programme Office (EWI) was set up in May 2006 to spearhead the development of the environment and water industry. Led by Singapore's national water agency, PUB and working with partner agencies such as EDB Singapore, IE Singapore and SPRING Singapore, EWI adopts a three-pronged strategy with technology as a key pillar. Our vision is to grow value-added (VA) contribution from the water sector from \$0.5 billion (0.3% of GDP) in 2003 to \$1.7 billion (0.6% of GDP) by 2015.

Notes

MBR: Membrane Bioreactor

MBR is the combination of a membrane process with a suspended growth bioreactor, and is now widely

used for municipal and industrial wastewater treatment

UASB: Upflow Anaerobic Sludge Blanket

UASB is a form of anaerobic digester that is used in the treatment of wastewater, which the most suitable and compact technology to decompose organic substance easily with high speed by anaerobic bacteria.

COD: Chemical Oxygen Demand

COD is one of the water quality indicators, it is the amount of oxygen required to oxidize materials which can be oxidized in water.

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