



## Experimental study on the thermal performance characteristics of hollow-fiber vacuum membrane distillation module

Hong-Jin Joo, Hee-Youl Kwak\*

*Solar Energy Research Division, Korea Institute of Energy Research (KIER), 152 Gajeong-ro, Yuseong-Gu, Daejeon, Korea, Tel. +82-42-860-3516; email: hykwak@kier.re.kr (H.-Y. Kwak), Tel. +82-42-860-3093; email: joo@kier.re.kr (H.-J. Joo)*

Received 30 January 2017; Accepted 22 March 2017

---

### ABSTRACT

In this study, a performance experiment was conducted on the feedwater conditions of a polyvinylidene fluoride hollow-fiber vacuum membrane distillation (VMD) module prior to construction of a VMD seawater desalination demonstration plant in South Korea that will have a capacity of 400 m<sup>3</sup>/d. The VMD module, manufactured by Econity Co., Ltd., South Korea, has an effective area of 5.3 m<sup>2</sup>. For the performance test of the hollow-fiber VMD module, a laboratory-scale VMD system was built and the tests were conducted under various feedwater conditions. The results showed that under feed conditions of 75°C, 8 m<sup>3</sup>/h feedwater flow rate, and salinity of 35,000 ppm, permeate flux was up to 18 LMH and salt rejection was up to 99.99%.

*Keywords:* Membrane distillation; Vacuum membrane distillation; Hollow-fiber membrane distillation

---

\* Corresponding author.

*Presented at the 9th International Desalination Workshop: Sustainable Desalination (IDW2016), 13–15 November 2016, Abu Dhabi, UAE.*