

# Technical Applications Bulletin 102

## Surface Characteristics of LG Chem's NanoH<sub>2</sub>O™ RO Membranes

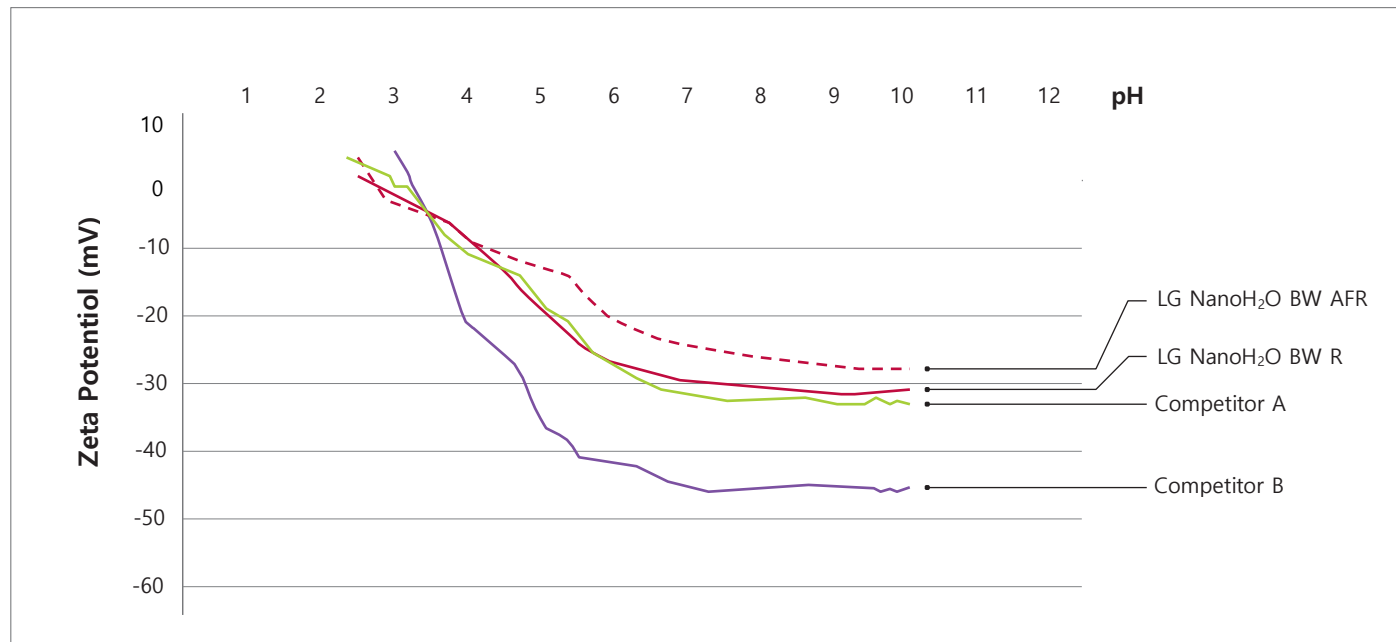
Membrane surface roughness and zeta potential are measured to analyze the surface characteristics of LG Chem's NanoH<sub>2</sub>O membranes. It is understood that membrane surface roughness is correlated with colloidal fouling of RO membranes. Colloidal particles can plug the valleys of the relatively open and rough membrane surface, effectively increasing the resistance to water transport. In essence, lower surface roughness can contribute to reduced colloidal fouling potential. Surface roughness is represented by the root mean square (RMS) roughness. The roughness of LG Chem's NanoH<sub>2</sub>O RO membranes is shown in Table 102.1 below.

**Table 102.1 Summary of membrane RMS surface roughness obtained using AFM**

Membrane Type	LG SW ES	LG SW R	LG SW SR	LG BW R	LG BW AF
Average RMS (nm)	112	105	107	94	94

The polyamide membrane typically carries a negative membrane surface charge. The interactions with charged foulants can be reduced by altering the membrane surface charge. Using neutral compound to cover the negative charges of the polyamide membrane surface can reduce the interactions between charged foulants and the membrane surface. LG Chem's NanoH<sub>2</sub>O BWRO products show a surface charge closer to neutral between pH 6 to 10 due to the cross linking protective layer. In addition, this antifouling layer protects the membrane's surface to reduce damage to the polyamide membrane surface during CIP operation between pH 2 to 13.

**Figure 102.1 LG Chem's NanoH<sub>2</sub>O BWRO membranes zeta potential data compared to other commercially available membranes**



Notice: The use of this product in and of itself does not necessarily guarantee the removal of cysts and pathogens from water. Effective cyst and pathogen reduction is dependent on the complete system design and on the operation and maintenance of the system. No freedom from any patent owned LG Chem, Inc. or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time. Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other government enactments. LG Chem assumes no obligation or liability for the information in this document. NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED. All trademarks stated herein are properties of their respective companies. LG NanoH<sub>2</sub>O is a wholly owned company of LG Chem, Ltd. All rights reserved. © 2020 LG NanoH<sub>2</sub>O, Inc.

Contact LG Water Solutions [www.lqwatersolutions.com](http://www.lqwatersolutions.com) | [waterinfo@lqchem.com](mailto:waterinfo@lqchem.com)

Version 2.0.1