

# Technical Applications Bulletin 104

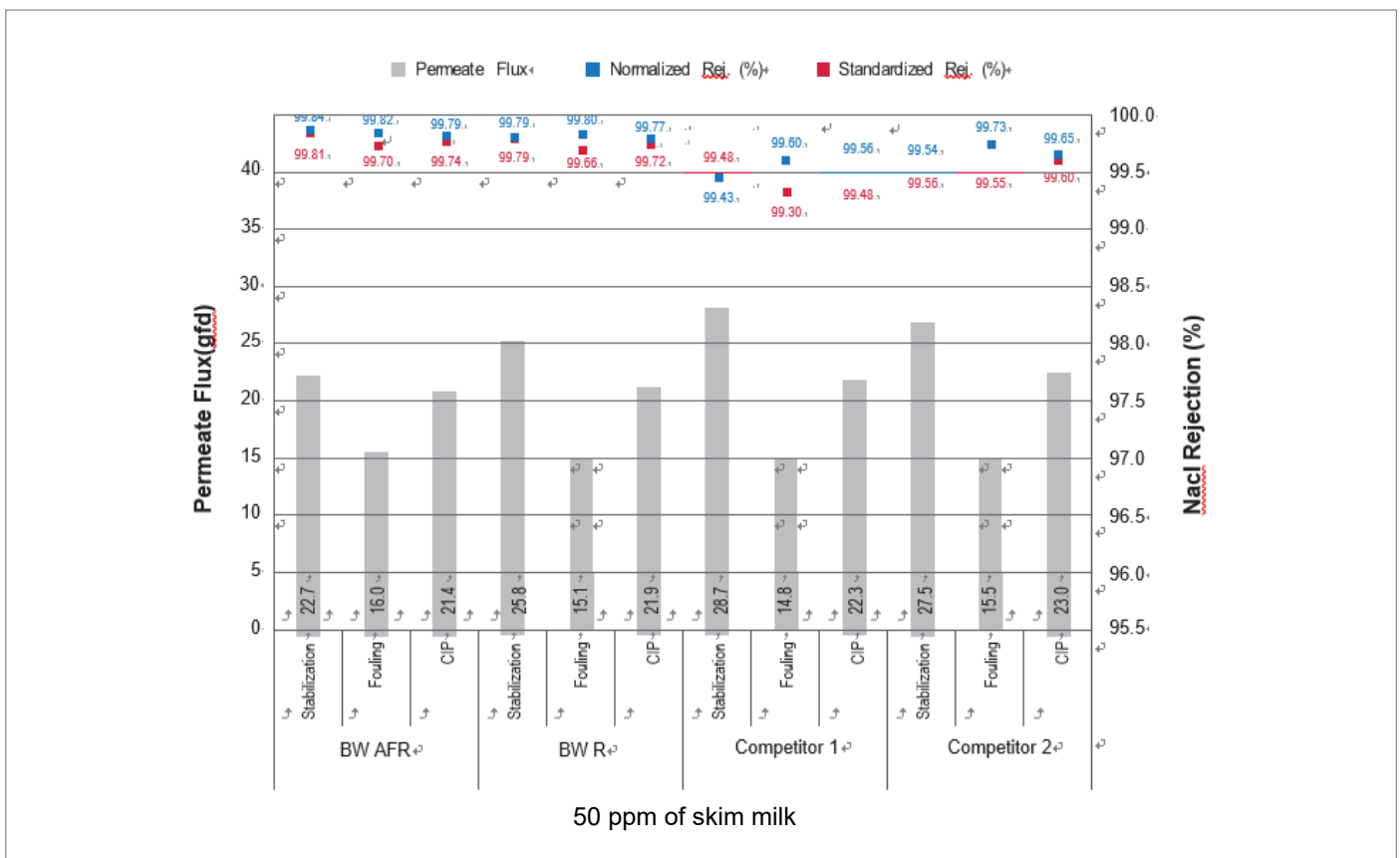
## Fouling Studies on LG Chem's NanoH<sub>2</sub>O™ RO Membranes

LG Chem has developed fouling-resistant membranes as part of its NanoH<sub>2</sub>O™ line of brackish water RO (BWRO) membranes. A study was conducted to verify the anti-fouling properties of LG Chem's membranes against organic and inorganic foulants.

LG Chem's models LG BW R and LG BW AFR were tested under normal/standard operating conditions alongside two competitor's membranes. The feed water consisted of 2,000 ppm of NaCl and 100 ppm of NaHCO<sub>3</sub>, and the study was performed under 225 psi at a temperature of 25 °C.

After initial membrane performance was stabilized, 50 ppm of skim milk (representing organic foulants) and 100 ppm of colloidal silica (representing inorganic foulants) were added into the feed water. After running 24-30 hours with the aforementioned foulants, a clean-in-place (CIP) was performed with all membranes. After the CIP, the membranes were re-tested under standard operating conditions. The results from the study are shown below.

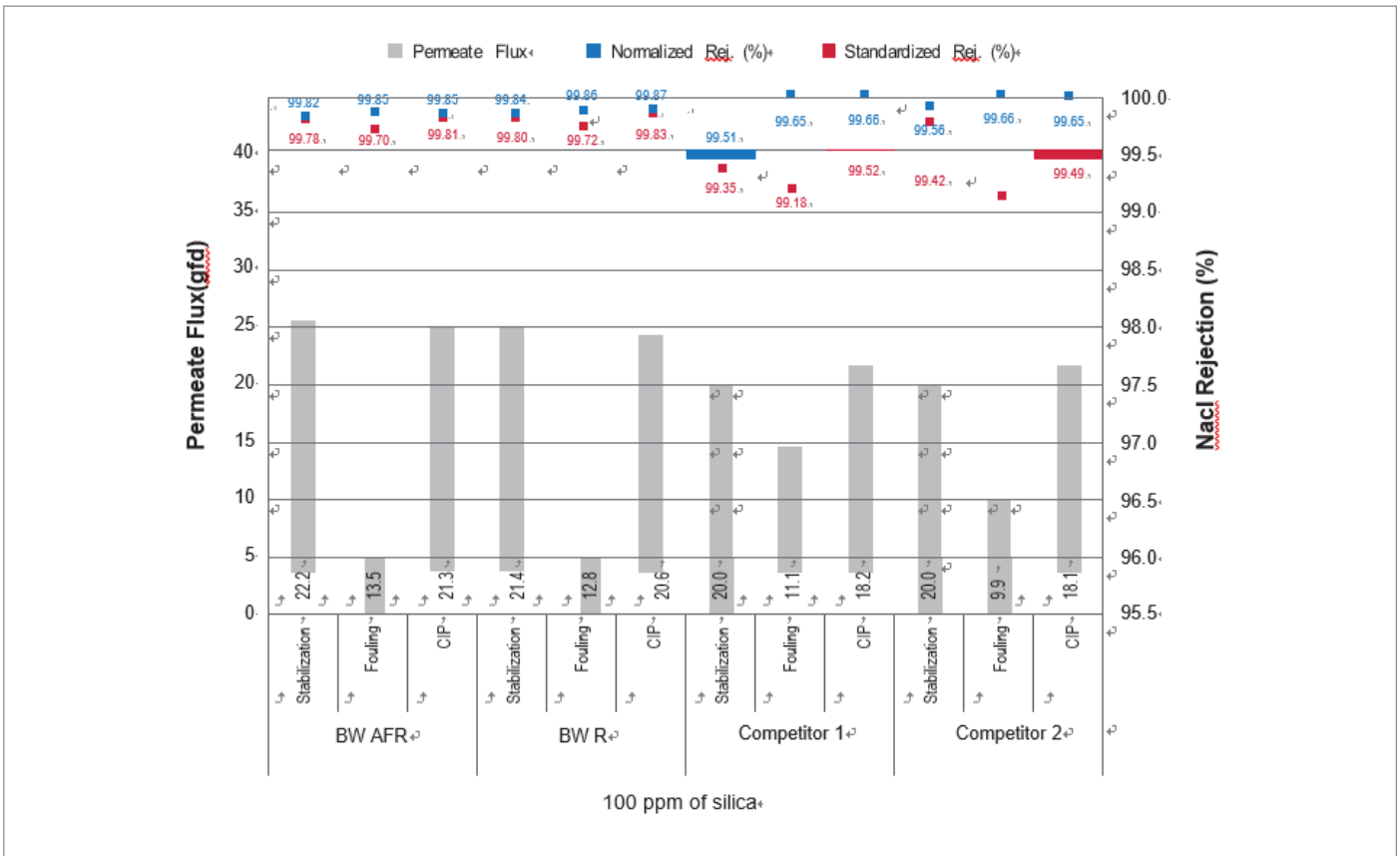
**Figure 104.1 Permeate flux and NaCl rejection during organic fouling test using skim milk**



The results show more consistent salt rejection of LG Chem’s LG BW AFR and LG BW R membranes during membrane fouling and CIP tests when compared to the competitors. Additionally, when compared to the competitor’s membranes after the CIP, LG Chem’s NanoH2O membranes recovered closer to the initial flux before the fouling test.

In comparing Figure 1 versus 2, the results also show that organic fouling provides more adverse impact to the membrane’s performance compared to inorganic fouling. The CIP after organic fouling was not able to recover the membrane flux as well as the CIP after inorganic fouling.

Figure 104.2 Permeate flux and NaCl rejection during inorganic fouling test using silica



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