General instructions and conditions for RO cleaning

The surface of an RO membrane is subject to fouling by suspended solids, colloids and precipitation. Pre-treatment of feed water prior to the RO process should be designed to avoid contamination/fouling of membrane surface as much as possible.

Operation at optimum conditions (permeate flow rate, pressure, recovery and pH-value) will result in less fouling of the membranes.

SDI15 is a measurement of particulates present in the feed water. With high SDI15 values (even in allowable range), membrane fouling due to particulates can cause performance decline in long-term operation.

Fouling can also be a consequence of large variations in raw water quality, or of errors in RO operation mode.

Fouling of the membrane surface will result in a performance decline, i.e. lower permeate flow rate and/or higher solute passage and/or increased differential pressure loss from feed side of a stage to the brine side.

Illustration 1 illustrates the effect of flux decrease due to fouling, and restoration of flux through cleaning. If the source of the foulant is not addressed and corrected, foulant removal will only bring temporary relief, as illustrated by the “saw tooth” pattern of the permeate flow in Illustration TMM-300.1.

It should be noted that the best solution is typically to remove the foulant through improved pretreatment rather than subject the membranes to repeated cleanings.