

Technical Information

Procedure for Measuring Silt Density Index (SDI)

The Silt Density Index, or most commonly referred to as SDI, is a popular method of determining feed water quality of reverse osmosis membrane systems. SDI is a measurement of the fouling potential of suspended solids. Typically reverse osmosis systems require SDI to be below 5.0 in sea water systems, and below 4.0 in brackish systems*. SDI values are reported as SDIX, where X is the total time, reported in minutes, required to obtain the final sample.

In essence, the SDI measurement is a simple, pressure regulated test to measure the flow decline, or decline in filtration rate of the feed water through a 0.45 μ filter. Though easy in theory, the procedure and operation requires practice to get accurate results.

General Rules for Conducting SDI Test

- Ensure that the 'O' ring is clean and in good condition.
- Prior to installing the filter, flush the equipment to remove contaminants.
- Carefully load membrane filter to avoid any damage.
- Ensure all air is purged from inlet side of filter housing.
-

Procedure

1. Purge any air in the filter holder. This can be achieved by opening the bleed valve or loosening the filter holder while cracking the ball valve. After purging, close the bleed valve or the holder.
2. Place 500 ml graduated cylinder under the filter apparatus to measure the time it takes to fill.
3. Open the ball valve fully, verifying that the regulator is set at 30 psi, and measure the time it takes to fill the graduated cylinder up to 100 ml and 500 ml from the time the valve is opened. Record these values, leaving the valve open and letting the flow continue**.
4. Subsequent measurements should be conducted at five minutes, ten minutes and fifteen minutes from the time the ball valve was initially opened. Again, record the time it takes to fill 100 ml and 500 ml, leaving the valve open and letting the flow continue until completion of the test. ***



SDI Measurement Kit

* Verify with the membrane manufacturer and/or system designer as to the specific SDI limits for your site.

** The time to collect 500 ml of water should be approximately five times greater than the time to collect 100 ml. If it takes longer than this to collect 500 ml, the test should be conducted using only 100 ml collection time.

*** If the pressure exceeds 75% of 30 psi set point, re-run the test utilising a shorter time (typically 5 or 10 minutes).

SDI is calculated using the following formula:

$$\text{SDI15} = (1 - T_i/T_f) / T_t * 100$$

where SDI15 = Silt Density Index at 15 minutes

T_t = total test time in minutes

T_i = initial time in seconds to obtain 500 ml sample

T_f = time required in seconds to obtain 500 ml at 15 minutes (or less)