

Although the values do not directly correlate to the fouling potential of a specific water, the Silt Density Index, or SDI, test is considered to be an industry standard for measuring the colloidal fouling potential of spiral wound membranes.

For SDI test results to be accurate, the feed line to the kit must be connected to the raw water line representative of the feedwater to the RO system. Ensure that all of the air is purged from the apparatus and that the feed pressure is adjusted to 30 psig.

#### • SDI TEST PROCEDURE:

The initial time required to fill a 500 ml graduated cylinder is measured and recorded as  $t_0$ . A measure of the time required to collect 500 ml volumes is noted again at 5, 10 and 15 minutes after the initial start. These times are recorded as  $t_5$ ,  $t_{10}$  and  $t_{15}$  respectively.

#### • CALCULATION OF SILT DENSITY INDEX (SDI):

The SDI value is then calculated using the following equation:

$$SDI = \frac{(1 - t_0 / t_{15}) 100}{T}$$

$t_0$  = Initial time in seconds required to collect a 500 ml sample.

$t_{15}$  = Time in seconds required to collect a 500 ml sample after fifteen min.

$T$  = Total test time in minutes.

#### • RECOMMENDED SDI VALUE:

The major membrane manufacturers typically recommend maintaining an SDI value of 3.0 to 5.0 for feedwater to a reverse osmosis system.

#### • EVALUATING SPENT FILTERS:

Figures 1 – 3 are photos of actual SDI pads taken at a single customer site. The benefit of injecting coagulant ahead of the multimedia filter is apparent by comparing Figure 2 and Figure 3. The SDI test in Figure 3 was taken on the MMF effluent of an on-site pilot filter that was drawing feedwater from the same source as Figure 2.



Fig 1: SDI pad of the Feedwater.



Fig 2: SDI pad of the downstream MMF effluent, no coagulant addition.



Fig 3: SDI pad of the downstream MMF effluent, with coagulant addition.

