

Technical Information

Pressure Tube Shimming Procedure

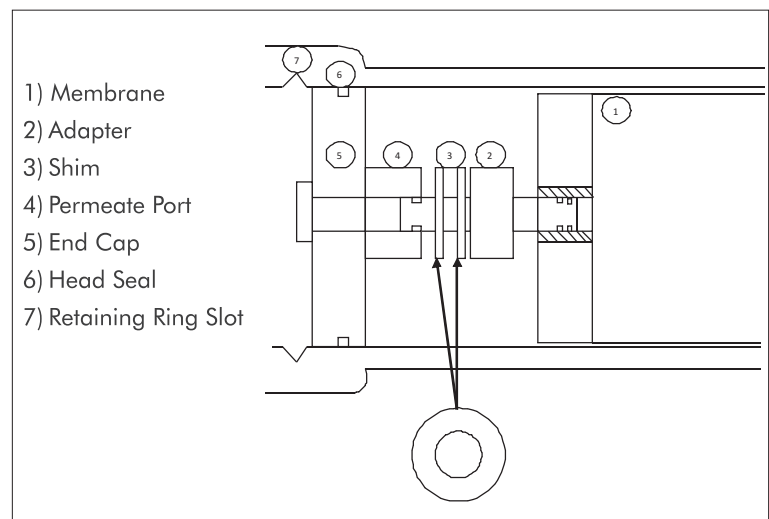
Shimming is the process of placing pieces of material (shims) between two parts to take up free space to prevent movement. Plastic or PVC washers are used as shims in membrane systems.

The process of shimming is performed after the membrane elements are loaded. The element stack should be pushed completely into the vessel such that the downstream element is firmly seated against the thrust ring at reject end of the pressure tube. User can also refer pressure vessel manufacturer's instructions on loading of elements.

Face-to-face end plate dimensions may vary among pressure vessel manufacturers. Hence, we strongly recommend that the element loaded within the pressure vessel be shimmed to remove excess or free space. In case of free space can result in movement of membranes. The movement can result in friction against inter connector 'O' rings, particularly during start up and shutdown. Over a period of time, it can cause them to abrade and possibly break. In case of severe pressure drop, 'O' rings can completely dislodged or blow out of their slots.

Shimming Procedure

- 1) Remove the adapter o-ring and head seal from the feed end of the pressure tube components. This will assure that there is no interference from any of the sealing components and minimum force is required to fit the end-cap assembly and the adapter.
- 2) Remove the end-cap assembly and slide shim over the head end of the adapter that fits into the permeate port. Initially add only two shims and check for possibility to install the retaining rings after fitting the end-cap assembly and the adapter.
- 3) If there is a gap between the slot of the retaining ring and the end-cap assembly then add one or two more shims and recheck.
- 4) Once the end-cap assembly and the slot of the retaining ring are face to face then further shims are not required to be added.
- 5) After reaching the above stage, remove the end-cap assembly and adapter. Reinstall the adapter 'O' ring and head seal.
- 6) Close the pressure tube as per manufacturer's instructions.



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)