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Leak Detection In Membrane Vessels

Occasionally a leak will develop in a membrane vessel. You will be able to tell there is a leak by the fact that the permeate, which should be very clear, will have a slight amount of turbidity, or cloudiness to its appearance.

Determine which vessel has the leak by closely examining the permeate flowing through the plastic elbows on the ends of the vessels while the system is in normal operation. You will notice a slight cloudy appearance to the permeate in one of the elbows.

Once it is determined which vessel has the "leaker", you will need to disconnect that permeate elbow ONLY connected to this vessel while the system is still in operation. Do this by unclamping both clamps from the elbow. You can do this while the system is in operation. Place a blank cap over the port on the permeate header to prevent unnecessary amounts of permeate from running out and making the work more difficult. You will now have the permeate from the suspect vessel running freely out of the end cap and onto the floor.

Next, determine where in the vessel the leak is. This is accomplished without disassembling the vessel while the system is running on product. Secure a 10 meter (30 foot) length of 3/8" O. D. plastic air line tubing. Carefully measure from one end of tube, and at the first 40 inch mark, draw a band around the tube with a permanent marking pen. Continue this at 40 " lengths down the tube until there are 5 of these 40 " marks.

Once the tube is prepared, insert the tube all the way into the vessel until it stops against the far end cap. Wait about 60 seconds and then collect a sample from the end of the inspection tube into a clear glass or Pyrex or CLEAR plastic beaker. It is important that this inspection glass be crystal clear. Carefully inspect the contents of the glass for turbidity. If the sample is clear, withdraw the tube one element length, and repeat the procedure. It is VERY IMPORTANT that you wait about 60 seconds after each movement of the tube before collecting the next sample to be sure that the sample you have taken is truly from the new location.

Continue to collect samples in this manner until you find the place where the permeate is turbid. Once you have located the approximate location, by very carefully positioning the tube and sampling, you will usually be able to narrow the point down to a single membrane element or interconnector. The most common place to find leaks is at the interconnector that is located between the end cap and the first element in the vessel at either end of the vessel.