

Replacing Membranes and Units

Bulletin Brief

Optimum performance and operation of high efficiency flexible membranes requires system performance monitoring and periodic system inspection. To maintain optimum performance, membrane replacement is required at various intervals.

Technical Presentation

Replacing FlexAir™ Diffuser Sheaths

The following items may be helpful in servicing the membrane diffuser assemblies during periodic inspections or maintenance procedures:

1. Ladder to access the de-watered basin
2. Protective gloves and clothing
3. Crimping or nipper pliers
4. Long-handled bristle brush to clean assembly for observation
5. Spare FlexAir sheaths and crimping clamps

If routine inspections reveal the need to replace a membrane, the following guidelines should be followed.

1. Remove the stainless steel (SS) crimping clamps. This is easily accomplished by bending back the small tab on the clamp with a crimping tool or screwdriver. The operator should not attempt to snip or cut the ear of the clamp. The SS material is very strong and excessive force is required to shear the material.
2. Gently pull the membrane off the support tube. Care should be taken not to break or damage the support or the unit connection to the lateral piping during this removal operation.
3. Installation of the new sheath is done by reversing the above procedure. SS crimp clamps should be fully compressed with an all-purpose crimper. Outside edge of the stainless steel clamp should be located 1/4" from the edge of the sleeve.

NOTE: The non-perforated portions of the membrane should be installed on the top and bottom of the diffuser and centered over the air discharge holes to provide check valve action.

Inspect unit and piping for foulants before replacing Membrane

When replacing membranes, it is important to inspect the diffuser unit and associated piping to ensure that the unit and piping are clean and free from foreign material and debris. If a new membrane is placed on a unit that is fouled, or in a system that has foulants in the air distribution piping, the membrane useful service life may be significantly diminished.

Technical Bulletins are presented as a service by Environmental Dynamics Inc. of Columbia, Missouri.
CTDC050100

Foulants on the inside of the diffuser body or air piping may be transferred to the underside of the new membrane during routine operation. Once on the backside of the membrane, plugging of the membrane from the inside will occur, effectively stopping airflow to the unit. An increase in system pressure and redistribution of air to other areas of easier escape will occur.

The decrease in air distribution and uniformity in a system due to internal fouling will greatly impact performance of the system. Potential for damaging other units in the system by increasing the airflow per unit above a unit's rated capacity increases. Once a unit is damaged by increased airflow, a breach in the system typically occurs which allows more foulants into the system, in turn greatly impacting and impairing the overall system performance and operation.

Tips for Replacing a Membrane

Once a membrane has been removed from the membrane support, drying the support or applying a small amount of powder (common baby powder) will aid in the reinstallation of the membrane on the support tube. Also, gently pushing the membrane on rather than trying to pull the membrane into place helps keep the membrane properly aligned on the support tube and reduces the risk of damaging the membrane during installation.

Replacing Less Efficient Units

It is possible to upgrade system performance and operation by replacing less efficient coarse bubble diffuser units or fine bubble units that have a smaller diameter or length. Many systems were installed with piping which has a 3/4" NPT (F) pipe thread outlet for connection of a unit which has a 3/4" NPT (M) connection.

Replacement of units requires unthreading the smaller, less efficient units and installing a larger, more efficient unit in its place. An increase of 30 to 50 percent of active surface area is possible in some applications. An increase in system performance of 15 to 20 percent is possible simply by replacing existing membranes with a properly designed and engineered membrane.

Properly operated and maintained, membranes for aeration and mixing systems as provided by Environmental Dynamics Inc. will provide years of high efficiency treatment with minimum operator attention.

For specific information on proper design and evaluation of your existing system contact Environmental Dynamics, Inc. at 573-474-9456.