

Mechanical and Performance Diffuser Specifications

Aeration Systems

Bulletin Brief

Technical Presentation

Proper specifications of membrane diffuser units require a rational presentation of features and performance desired. Specifications of diffuser systems can be broken into 4 general categories.

1. Mechanical specifications of piping, pipe support systems, and general arrangement of diffusers. Pipe materials, pipe diameters, wall thickness or schedule, with deflections and/or pipe stress are standard items in a successful specification. Pipe support materials, spacing, pull out resistance are additional mechanical items to be specified.
2. Process specifications for the aeration system. Typical items include:
 - a. Amount of clean water oxygen transfer (SOTR) to be delivered to the system. This is generally #O₂/hr (kg/Kwh) at minimum load, average load, and peak load. Note: Generally preferable to give SOR values rather than AOR or field values to be sure all vendors offer comparable capacity. When field AOR values are given, many variables are left to selection by the equipment manufacturer with limited control of safety of design.
 - b. Diffuser submergence in feet (meters) below water surface.
 - c. SOTE % desired at specified submergence.
 - d. Air volume available in SCFM or Nm³/AR
 - e. Air pressure available at top of diffuser system drop pipe.
 - f. Method of operation, i.e., on/off or range of operation conditions.
 - g. Air flux rate - air volume/area of diffusers, i.e., scfm/ft² of membrane (Nm³/m²).
3. Mechanical Specifications of Diffuser:
 - a. Force resistance of diffuser connection to piping.
 - b. Resistance to uplift.
 - c. Tolerance of diffuser elevation.
4. Membrane Specifications: key items for specifications include:
 - a. Certified test through 1 million cycles on-off for endurance.
 - b. Thickness.
 - c. Membrane compound i.e., EPDM, urethane, etc.
 - d. Tear strength.
 - e. Tensile strength.

- f. Maximum allowable extractible oil content (particularly for rubber compounds).

Proper presentation of the above 4 items will result in competitive offers and assure performance and system quality. Please note geometry of the diffusers as tube or disc are not performance specifications and should not be a controlling variable!

For specific information on aeration system selection considerations, contact Environmental Dynamics Inc. at (573) 474-9456.

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