

Product Specification Document

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Scope: Provide all materials, equipment, and accessories necessary to finish and install floating mixing aerators at aerobic digestion lagoons, aerated lagoons, aeration ponds, sludge holding lagoons, or holding tanks.
- B. Mixing Aerator System consists of the following components: re-compression float head, air inlet, oxygen transfer chamber, weight ring, manifold, perforated membrane diffuser, lifting/tethering points, and air supply hose. Ground mounted blower package and mooring system shall be specified separately and shall be supplied either as part of the TITUS® Twister®-FL package or separately by others.

1.2 QUALITY ASSURANCE

- A. A single manufacturer/supplier regularly engaged in design, manufacture, assembly, and production of floating aerators shall fabricate and furnish mixing aerator.
- B. Equipment furnished and installed under this section shall be fabricated, assembled, installed, and placed in proper operating condition in full conformity with the drawings, specifications, engineering data, instructions, and recommendations of the project engineer and equipment manufacturer.
- C. All components of the aeration equipment shall be engineered for long, continuous, and uninterrupted service.
- D. Corresponding parts of multiple units shall be interchangeable.
- E. The floating mixing aerator shall enhance aerobic digestion and mixing by pulling volatile solids and water with low dissolved oxygen levels vertically up through the oxygen transfer chamber. Transferring oxygen into the water column as it rises, impinging the solids violently against the static, re-compression float head, reducing the particle size, and discharging the solids into an oxygen rich sub-surface.
- F. Manufacturer shall provide performance testing data, executed via third-party testing engineer.

1.3 SUBMITTALS

- A. Submit complete assembly and installation drawings, together with detailed specifications and data covering materials used.
- B. Provide details for delivery, storage, and handling, including the following;
 - 1. Terms of delivery.
 - 2. Expected delivery schedule.
 - 3. Suggested storage.
 - a. Explicitly state all storage conditions which will void any warranties.
 - 4. Handling recommendations regarding the following;
 - a. Preservation of unit functionality.
 - b. Preservation of unit integrity.
 - c. Safety of personnel and bystanders during delivery, unloading, storage, and installation.
- C. Operation and Maintenance Manuals: Submit complete manuals including copies of all approved shop drawings, test reports, maintenance data and schedules, description of operation, and spare parts information.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Provide one of the following;
1. TITUS® Twister®-FL Floating Mixing Aerators
 2. No Equal

2.2 PERFORMANCE

- A. Mixing aerator unit designations:
1. FL-4
 2. FL-6
 3. FL-8
- B. Mixing aerator minimum clean water standard aeration efficiency:
1. FL-4: 1.9 lb/hp-hr
 2. FL-6: 2.0 lb/hp-hr

2.3 MATERIALS AND COMPONENTS

- A. The floating mixing aerator shall have no moving parts and will not require electrical power in the lagoon, tank, or reservoir.
- B. The unit shall be air driven by a shore-based blower, separately sized, specified, and qualified.
- C. The floating mixing aerator shall be adaptable to bodies of liquids from a minimum of 5' depth with side intake ports, to deeper liquid levels with bottom intake ports. Mixing aerator shall also have the capability to accommodate draft tubes, if required, with no loss of performance.
- D. Re-compression Float Head
1. Manufactured of rotationally molded medium density polyethylene(MDPE).
 - a. The float shall be high strength and scratch resistant, as well as UV resistant to protect the float from sunlight damage.
 - b. Resin shall have an ASTM D-1505 density with a typical value of .936g/cm³
 - c. The tensile strength of the resin has a typical value of 2,400psi @ yield, 2in/min.
 2. Filled with closed-cell polyurethane foam having a minimum of 2.0 lbs per cubic foot density.
 3. Completely sealed watertight.
 4. 116 inches in diameter, 16 inches thick.
 5. Float construction:
 - a. The float shall be constructed so that all stress imposed from wave action and mooring line tension shall be transmitted from each mooring line to another by pulling across the float in such a manner as not to flex the structure.
 - b. The float construction shall be such that diffusion head and static load, in addition to the entire dynamic load, spread these forces uniformly around the full 360 degree circumference of the central core of the float.
- E. Manifold and Perforated Membrane Fine Bubble Diffuser
1. The floating mixing aerator shall be designed to accommodate a replaceable molded perforated frustoconical membrane diffuser.
 2. The floating mixing aerator shall be designed to release a continuous stream of air through a frustoconical membrane diffuser. The diffuser features thousands of very small rectangular perforations that release fine bubbles and close behind the bubble, preventing debris from entering the diffuser and minimizing diffuser fouling. The frustoconical design reduces bubble combining, ensuring bubbles are separated for a longer period, maximizing SAE or oxygen transfer efficiency. This creates a stable environment for bacterial propagation.

2.3 MATERIALS AND COMPONENTS - Continued

F. Tethering

1. All mooring connections shall be stainless steel.
2. The floating mixing aerator shall have 3 mooring points, suitably spaced around top surface of the re-compression float head for up to (3) point mooring.
3. Mooring and anchoring system shall be approved by manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Installation shall be in complete accordance with manufacturer's instructions.
- B. Check and align all equipment assemblies after they have been installed to ensure alignment and assembly has been unchanged from factory assembly conditions.

3.2 FUNCTIONAL TEST

- A. Perform functional testing for the installed units. Prior to system start-up, inspect system components for proper installation, connection, and satisfactory operation. The Manufacturer's representative shall inspect installation if required and provide certification that the system components have been installed correctly and ready for operation.

3.3 START-UP AND OPERATOR TRAINING

- A. Services of the manufacturer's factory trained representative, who is specifically knowledgeable in the type of equipment specified herein, shall be provided during the equipment installation period if required.
- B. Upon complete installation of equipment by installing contractor, the manufacturer's service representative will approve the installation and begin start-up and training if required.