

ZEPHYR INDUCED AIR FLOTATION SPECIFICATION

A. *General*

Provide a total of ___ ZEPHYR Induced Air Flotation (IAF) units as manufactured by AEROMIX SYSTEMS, INC. of Minneapolis, Minnesota USA. Each ZEPHYR shall be ___ Horsepower (___ kW) and consist of an electric motor flexibly coupled to a solid rotating shaft. The shaft shall be supported at the top and bottom by two sealed, tapered roller bearings. A diffuser disk shall be affixed to the lower end of the shaft. A stationary draft tube shall be provided which allows the passage of air between the draft tube and the solid shaft so that atmospheric air can be transferred through the unit and into the liquid. The rotating diffuser disk shall create a low pressure zone at its edge to draw air through the air inlet, through the draft tube and into the liquid. A by-pass valve shall be included to adjust the air bubble size.

B. *Shaft*

1. A one-piece, 1.00 inch (250 mm) diameter solid 17-4 stainless steel shaft shall be used. The shaft shall not be welded or pieced. Thin walled hollow shafts are not acceptable.
2. The shaft shall be precision machined with threads on the propeller end and a key way on both the diffuser and motor end. Shaft run out shall not exceed 0.005 inches (0.123 mm) along its entire length to assure straightness and vibration free operation. Balancing the shaft to reduce vibration is not an acceptable measure of shaft straightness.

C. *Shaft Bearings*

1. Two tapered roller bearings shall be used to align the shaft and take up any thrust loads from the diffuser. These bearings shall support the shaft near the top and bottom for maximum stability. Unsupported or cantilevered shafts are not acceptable. The shaft bearing design life (L10) shall be at least 100,000 hours as documented by an independent Registered Professional Engineer. This documentation shall be supplied with equipment submittals. Sleeve type, ball bearing type, or wastewater lubricated bearings are not acceptable.
2. All shaft bearings shall be sealed to protect them against splashing, submergence and the environment. Grease fittings shall be used to allow the addition of grease to each bearing. All grease fittings shall be located above the liquid surface.
3. A 316 stainless steel bearing support tube shall firmly support the bearings and protect the rotating solid shaft.

4. Seal modules, containing bearing seals, shall be located at the ends of the bearing support tube for the protection of the bearings from the environment. The seal modules shall be removable so all bearings can be easily inspected. Seal modules shall be 316 stainless steel.
5. A splash guard cone made of 316 stainless steel shall be provided at the lower end of the bearing support tube to protect the seals and seal module from foreign material and wastewater.

D. *Draft Tube*

A stationary draft tube and air inlet hole shall be used to minimize aerodynamic drag and interference. The draft tube shall be made of 316 stainless steel and shall be shaped in such a way to maximize air flow. Each inlet hole or slot shall be of sufficient size to give maximum air flow and minimum drag. Rotating hollow shafts or rotating air inlets shall not be used. The air passageway provided within the aerator shall be at least seven square inches (45 cm²) in cross-sectional area along its length to minimize drag.

E. *Diffuser Disk*

A specially designed, high efficiency diffuser disk shall be used. It shall be made of 316 stainless steel and shall be held in place with a stainless steel key, lock washer and nut. The diffuser disk shall have holes on the perimeter for fine bubble gas diffusion into the liquid. A separate "Flow Stopper" chamber shall surround the diffuser disk to minimize mixing.

F. *Motor Coupling*

A flexible coupling shall be used between the motor and Induced Air Flotation unit shafts which compensates for any parallel or angular misalignment between the Induced Air Flotation device and motor shafts. The coupling shall be a Woods type or equal with replaceable sleeve.

G. *Motor Mount*

Each Induced Air Flotation unit shall be provided with a 316 stainless steel motor mount incorporating two pins which fit into a mounting cradle and allows the unit to be easily rotated from nearly vertical to nearly horizontal. A bolt circle shall be provided on the mounting cradle that allows the aerator to be secured at various angles. The motor mount shall be designed to allow removal of either the motor or the Induced Air Flotation unit section for service without dismantling the entire Induced Air Flotation unit from the mount.

H. *Motor*

All motors furnished shall comply with all applicable provisions of the standards of EPACT 92 and the National Electric Manufacturers Association (NEMA). Each motor shall be standard TEFC (totally enclosed, fan cooled), have a service factor of 1.15 or greater (1.0 for 50 Hz), and be NEMA C-face design. No special fittings, face plates or

special design motors shall be used. Thrust loads shall not be placed on the motor bearings. All motors will operate at _____ VAC, _____ hertz, _____ phase, _____ % efficiency, _____ RPM.

I. Dial - a - Bubble

The Induced Air Flotation unit shall be provided with a by-pass valve to provide air bubble size and air flow rate adjustability. A valve stem shall be provided which extends above the water surface for easy adjustment.

J. Cold Weather Operation

The Induced Air Flotation unit shall be self-heating, requiring no heat tape, thermal packs or other special winter devices to prevent excessive ice buildup. The Induced Air Flotation shaft shall be sealed from the environment along most of its length to prevent ice from freezing around the shaft during off periods.

K. Factory Testing

Each Induced Air Flotation unit shall be tested at the factory for proper operation, lubrication and dry amp draw. A test sheet certifying proper operation shall be shipped with each Induced Air Flotation unit.

Note: Specifications available from AEROMIX Systems for Induced Air Flotation unit floats, wall mounts and accessories.

Contact AEROMIX SYSTEMS, INCORPORATED for zone of influence and other performance data.