environmental warehouse
water sciences
Unit 3, 93 Centennial Circuit, Byron Bay, NSW 2481 Australia Ph. 02 6685 5157

AIR+ Membrane Diffusers

Product Description

AIR+ Membrane Diffusers are used for aeration of water and wastewater.

When air is injected into the diffuser, the rubber membrane lifts off the plastic support base, resulting in thousands of holes opening and releasing air.

The circular membrane diffusers provide a high level of oxygen transfer into water & wastewater, with a uniform, controlled air bubble size. This aids management of dissolved oxygen levels in natural waters, in wastewater to minimise odour, in aerobic biological treatment processes and in aquaculture.

Product Benefits

The flat, large diameter design offers the following benefits:

- High oxygen transfer efficiencies
- Low cost, easy to install.
- Rubber EPDM membrane ensures long service life
- Effective over a wide range of air flows.
- Pores in the rubber diaphragm close when the air supply is removed. This prevents the diffuser pores from becoming clogged.
- Thousands of pores emit streams of fine bubbles. Bubble size is approx. 1-3 mm in diameter
- Low pressure drop of 4 kPa.
- Even air distribution over the full range of air flows.

Typical Applications

The AIR+ Membrane Diffusers may be used for many types of aeration applications including:

- small, domestic aerated wastewater treatment systems (AWTS)
- industrial wastewater treatment plants
- municipal wastewater treatment plants
- wastewater lagoons
- lakes & rivers
- aquaculture and fish ponds.

Air Diffusers:

Technical Data

Model M250

Parameter	Value
Diameter	250 mm (10")
Membrane	EPDM (hardness 60°)
Number of holes	6,000
Bubble Size	1 - 3 mm
Air flow rate	1.7 - 4.2 m3/h (1.0 - 2.5 cfm)
Diffusion area	0.043 sq.m (66 sq. inches)
Membrane support	ABS
Air connection	3/4" NPT male or 20 mm PVC socket

Model M320

Parameter	Value
Diameter	320 mm (12.5")
Membrane	EPDM (hardness 60°)
Number of holes	8,000
Bubble Size	1 - 3 mm
Air flow rate	3.0 - 5.9 m3/h (1.8 - 3.5 cfm)
Diffusion area	0.068 sq.m (106 sq. inches)
Membrane support	ABS
Air connection	3/4" NPT male or 20 mm PVC socket

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How Many Diffusers To Use ?

1. Air Flow to Oxygen Conversion:

Important facts:

- The oxygen content of air is 21%
- 1 m^3 of air contains 0.21 m^3 of oxygen (O_2)
- 1 m^3 of oxygen (O_2) at Standard Temperature Pressure (STP) has a mass of 1.44 kg

2. Diffuser Oxygen Output:

Diffuser Model: M250		
Air (m^3/h)	**O_2 (m^3/h)**	**O_2 (kg/h)**
1	0.21	0.30
2	0.42	0.60
3	0.63	0.91
4	0.84	1.21

Diffuser Model: M320		
Air (m^3/h)	**O_2 (m^3/h)**	**O_2 (kg/h)**
3	0.63	0.91
4	0.84	1.21
5	1.05	1.51
6	1.26	1.81

Standard Temperature & Pressure (STP)
STP is defined as a temperature of 0°C and an air pressure of 1,000 mbar or 1 atmosphere (equivalent to air pressure at sea level).

3. Biological Oxygen Demand (BOD):

The oxygen demand of a water system such as a sewage treatment plant or aquaculture pond is defined in terms of the BOD and the flow rate.

For example, if the water system has a BOD of 5,000 mg/L due to the load of bacteria or nutrient, and the water flow rate is 2 m^3/h, than the mass of BOD per unit time is 10 kg/h.

4. Diffuser Requirements:

In this example the aeration system must provide at least an equivalent mass of oxygen per unit time to BOD mass. The minimum oxygen supply is 10 kg/h, but an excess is desirable to manage the variations that typically occur in these applications.

From the tables in section 2, the number of AIR+ Diffusers required is as follows:

- 13 x M250 Diffusers, (12 kg/h of O_2) or
- 8 x M320 Diffusers (12 kg/h of O_2)

This quantity of Diffusers would provide a reasonable buffer of +20% more oxygen than the calculated demand for BOD.

Further Assistance:

For further assistance in calculating your requirements please email details of the application to:
sales@envirowarehouse.com

Ordering Information:

Part Number: M250 Price: $58.00
Part Number: M320 Price: $68.00

Related Products:

- Dissolved Oxygen Meter

Prices are in Australian dollars, and exclude GST and freight costs. For a quote including freight costs please email us at sales@envirowarehouse.com and include the delivery address.