EKOTON
AIR DIFFUSERS
HIGH EFFICIENCY
without maintenance
The total air flow rate fed to all EKOTON Air Diffusers in operation exceeds 15 000 000 m³/h.

For more than 20 years EKOTON Industrial Group delivered more than 700 000 linear meters of air diffusers and continues this input increasing.

ADVANTAGES OF EKOTON TUBE AIR DIFFUSERS

- **Do not require cleaning and washing.** The external polyethylene layer with “fibro-porous” construction provides for tough, reliable operation of the aeration system without the need for routine cleaning and washing.

- **Effective mass transfer and sludge mixing.** The bubbles which the EKOTON Air Diffusers produce have a diameter of only 2-3 mm which is ideal for oxygen transfer and mixing.

- **Reduced operating costs** due to low pressure loss.

- **Additional resistance to water hammers, pressure drops and other mechanical impacts** is provided due to the special design of the EKOTON Air diffuser.

- **EKOTON aeration system is easy to assemble.** Elements of the system are quickly assembled by threaded joints. Diffusers are fastened to the bottom with the fastening step of 2 m.

- **The rate of air flow supplied to our EKOTON Tube Air Diffusers** is 2-2.5 times higher than to conventional membrane diffusers. **This provides for lower investment and capital costs on projects.**

- Due to the use of the thermoplastic materials in their design, EKOTON Air Diffusers are **resistant to a wide range of challenging environmental and temperature conditions.**

- EKOTON Air Diffusers provide **consistent, reliable and stable performance during their long service life.**
Hulan District, Harbin, China
(Installation of EKOTON Aeration System)

Shanyin, China
(Installation of EKOTON Aeration System)

Herzliya, Israel
(Installation of EKOTON Aeration System)
AERATION SYSTEMS on the basis of Tube Diffusers

EKOTON Tube Air Diffusers were developed for application in municipal and industrial wastewater treatment plants. Their primary use is for supplying the required levels of oxygen to wastewater in the aeration tank while providing an efficient mixing.

More than 400 water and sewage companies in 10 countries have chosen EKOTON Tube Air Diffusers

Ostróda WWTP, Poland
Capacity: 10 000 m³/d
Equipment: 129 linear meters of EKOTON tube air diffusers

Herzliya WWTP, Israel
Capacity: 22 000 m³/d
Equipment: 600 linear meters of EKOTON tube air diffusers

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EKOTON provides up to 6 year warranty for the air diffusers, though the practice shows that they operate successfully after the expiry of the warranty period.

Novosibirsk WWTP, Russia
- **Capacity**: 700,000 m³/d
- **Equipment**: 25,000 linear meters of EKOTON tube air diffusers

Hulan District, Harbin, China
- **Capacity**: 100,000 m³/d
- **Equipment**: 3,000 linear meters of EKOTON tube air diffusers

Novokuznetsk WWTP, Russia
- **Capacity**: 315,000 m³/d
- **Equipment**: 12,000 linear meters of EKOTON tube air diffusers
Design of EKOTON Tube Air Diffusers

The EKOTON Tube Air Diffuser is made up of two pipes inserted one into another with an air gap running between them.

The outer pipe is porous in construction and is made from low-density polyethylene (LDPE). This pipe is called a fibro-porous disperser. During its manufacturing, a pneumatic extrusion process is utilized, when aerodynamically formed fibers from melted polyethylene are applied on a form-maker forming a pipe.

The inner pipe is made from PVC and is perforated.

The gap between two pipes is supported by cross ring insertions.

The supply air enters the gap between the inner and outer pipes through the numerous hole openings in the inner supply pipe. The air is then dispersed into the aerated liquid through the «fibro-porous» construction of the outer pipe forming numerous and consistent bubbles.

Forcing the air into the inner pipe and uniformly out through the «fibro porous» outer pipe provides a consistently uniform air distribution in the liquid you want aerated. This enables us to achieve a superior aeration efficiency with minimal energy cost.

COMPONENTS AND MATERIALS

<table>
<thead>
<tr>
<th>Description</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Perforated pipe</td>
<td>PVC</td>
</tr>
<tr>
<td>2 Fibro-porous disperser</td>
<td>LDPE</td>
</tr>
<tr>
<td>3 Cross ring insertion</td>
<td>PE</td>
</tr>
</tbody>
</table>
**TECHNICAL CHARACTERISTICS**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Airflow range</td>
<td>5-45 Nm³/(h*m)</td>
</tr>
<tr>
<td>Design airflow</td>
<td>8-25 Nm³/(h*m)</td>
</tr>
<tr>
<td>Air diffuser diameter</td>
<td>0.12 m</td>
</tr>
<tr>
<td>Air diffuser length</td>
<td>1-2 m</td>
</tr>
<tr>
<td>Bubble diameter</td>
<td>1-3 mm</td>
</tr>
<tr>
<td>Inlet air temperature</td>
<td>up to 100 °C</td>
</tr>
</tbody>
</table>

**Oxygen transfer efficiency**

![Oxygen transfer efficiency graph](image)

**Pressure loss characteristics**

![Pressure loss characteristics graph](image)
“Major repair works of the aeration system in the aeration tanks were executed in 2009-2010. The EKOTON diffusers were installed in the aeration tanks. The total number of aeration branches in each aeration tank is 10 (including 3 branches in the first and second corridors each and 2 branches in the third and fourth corridors each).

Consequently, the following results were reached:
• The uniform air distribution prevented the formation of stagnant zones, whereby the decay of activated sludge stopped.
• The fine-bubble aeration ensured an effective saturation of the mixed liquor with air, thus increasing the activity of microorganisms in the activated sludge.
• The electricity consumption for the operation of the aeration system was reduced by 20 000 kWh/day;
• The efficiency of nitrogen compounds' removal increased.

In addition, simple and fast installation works may also be attributed to the advantages of EKOTON diffusers.”

EKOTON tube air diffusers allow the significant reduction of energy consumption at wastewater treatment plants.
For more than 20 years of work we have gained the unique experience that allows us to offer customers only the most effective solutions.

Reference of the Chief of wastewater treatment facilities and pump stations in Herzliya city (Israel):

"... In November 2013 we launched the first section of the reactor with EKOTON tube air diffusers.

The results exceeded all our most optimistic expectations. The quantity of consumed air as well as the energy was significantly reduced.

Liquid saturation with oxygen was stable and uniform throughout the whole basin. After 2 months, without waiting for the end of 6-month period of supervision of air diffusers operation, as agreed earlier, it was decided to replace the diffusers installed in two other sections with EKOTON Air Diffusers, and that was done gradually.

Today the entire reactor (3 sections) is equipped with EKOTON Air Diffusers and we are very pleased with the results obtained. The desired concentration of oxygen (approx. 2 mg/l) is maintained in all sections with much lower energy consumption.

Most of the day (14-16 hours) we use one air blower (4500 m³) and during peak hours (8-10 hours) we use two blowers, whereas before the replacement of aerators we had to use 2-3 air blowers."
According to the wishes of the customers, three installation options are available.

1. **Adjustable support** is recommended, if the leveling of the aeration system is necessary during its installation. The fixation is executed with anchor bolts.
   1. Fastening element.
   2. Adjusting nuts.
   4. Fastening for anchor bolts.

2. **Non-adjustable support without surcharge** is executed with anchor bolts.
   1. Fastening element.
   2. Pins.
   3. Fastening for anchor bolts.

3. **Non-adjustable support with surcharge** is recommended when aerators are to be installed in the tank without repair of its bottom. The fixation is executed by concreting the weight to the tank bottom.
   1. Fastening element.
   2. Embedded element.
   3. Concrete weight.

The total air flow rate fed to all EKOTON Air Diffusers in operation exceeds 15 000 000 m³/h.
### Dimensions

<table>
<thead>
<tr>
<th>Type</th>
<th>Total length (A), mm</th>
<th>Disperser length (B), mm</th>
<th>External diameter (C), mm</th>
<th>Disperser wall thickness, mm</th>
<th>Total weight, kg</th>
</tr>
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<tbody>
<tr>
<td>APKV-1</td>
<td>1020</td>
<td>940</td>
<td>120</td>
<td>10</td>
<td>4</td>
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<tr>
<td>APKV-1.5</td>
<td>1525</td>
<td>1445</td>
<td>120</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>APKV-2</td>
<td>2025</td>
<td>1945</td>
<td>120</td>
<td>10</td>
<td>8</td>
</tr>
</tbody>
</table>
EKOTON INDUSTRIAL GROUP

EKOTON Industrial Group is a leading manufacturer of equipment for wastewater treatment. EKOTON Industrial Group focuses in development, production and implementation of modern high quality technological equipment dedicated to municipal wastewater treatment as well as industrial applications in food process, cement, chemicals, coal and metal process enterprises.

Our company produces more than 35 different types of equipment for mechanical treatment, biological treatment and sludge dewatering. A wide range of EKOTON brand products allows us to offer our customers complex solutions using equipment we produce.

Our company’s production plants are located in Poland, Ukraine and Russia. More than 300 highly qualified specialists of EKOTON Industrial Group work to provide high quality services and equipment.

EKOTON equipment is successfully operated in 30 countries: Belarus, Bulgaria, Bangladesh, Germany, Hungary, Vietnam, Israel, India, Kazakhstan, China, Lithuania, Latvia, Moldova, the Netherlands, United Arab Emirates, Poland, Russia, Saudi Arabia, Singapore, Turkmenistan, Uzbekistan, Ukraine, Philippines.

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