

### Plate air diffuser ELASTOX®-P

#### Application

The latest generation of aerators, the ELASTOX®-P plate air diffuser, offered by us constitutes a system component for sewage technology based on our extensive know-how and long years of experience in the production and operation of sewage treatment facilities. The result is an aeration system that combines the advantages of all previous systems, i.e.:

- Low-buoyancy behaviour
- Low piping requirement
- Optimum gas admission properties
- High oxygen utilization values
- Long lifetime

Depending on the actual application and the basin geometry, the ELASTOX®-P plate air diffuser can be applied for area, broadband or line aeration as well as aeration with separate circulation. Since the application of the area-type aeration is almost independent from the basin shape, also existing buildings can very well be re-equipped or retro-fitted.

The structural design of the ELASTOX®-P plate air diffuser has been developed in such a way that, as a rule, the tube air diffusers of 40/70 diameter can be exchanged. Typical applications are the following:

- Preservation aeration of waste water e.g. in balancing tanks
- Oxygenation in activation basins
- Oxygenation for sludge stabilization
- Aeration of rivers and lakes
- Aeration of fish ponds
- CO<sub>2</sub> admission for neutralization



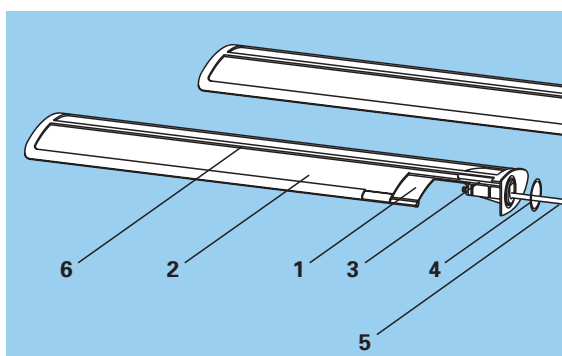
#### Operational principle

The structural design of the support body bottom surface prevents the accumulation of gas volumes below the air diffuser and reduces buoyancy by effective degassing.

The optimised perforation of the membrane in conjunction with the degassing surface directed upwards ensures a uniform coalescence-free gas admission with high oxygen utilisation coefficients.

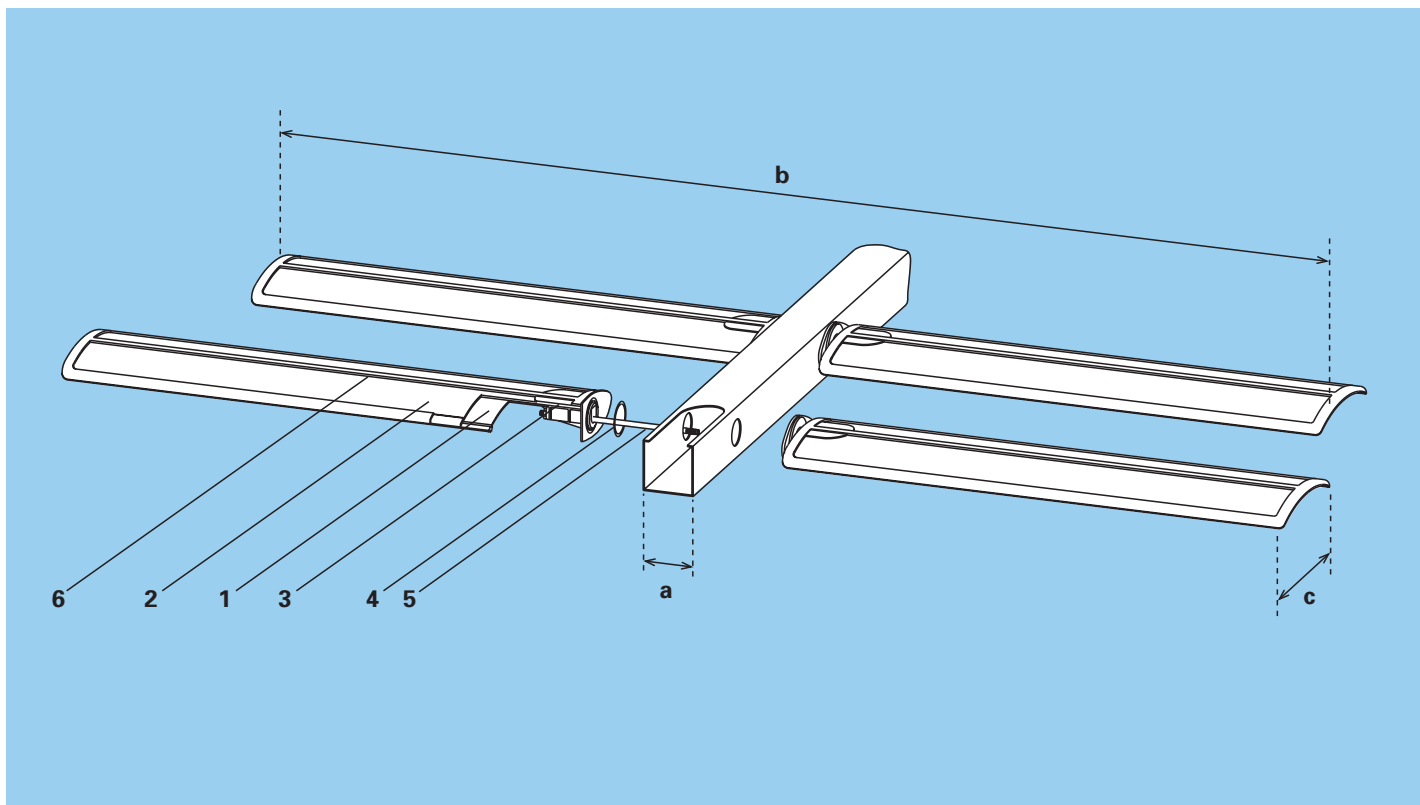
In case of pressure relief, the perforation of the rubber membrane closes automatically and thus prevents the ingress of liquid. Optionally, a flap trap can be inserted between the air inlet connection and the membrane, which additionally seals the air channels against liquid flowing back.

The special membrane materials, developed based on long years of experience, were optimized by numerous series of tests, and they are expected to have a long lifetime.



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|----------------|--------------------|
| 1 Support body | 4 Seal             |
| 2 Membrane     | 5 Tie rod          |
| 3 Flap trap    | 6 Membrane fixture |

## Design



- |                |                    |
|----------------|--------------------|
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The low-buoyancy behaviour of the ELASTOX®-P plate air diffuser enables the design of removable aeration systems that can be dismantled without having to empty the basin.

The slightly convex-shaped membrane is fixed to the support body by means of a framework structure and stabilised by a central ledge, which at the same time subdivides the gassing into two chambers. Due to this, the gas space between the membrane and the support body is minimized, and the buoyancy tendency is additionally reduced.

The air inlet connection has been designed in such a way that the connection on the aeration grid is accomplished with a borehole of  $\varnothing 40$  mm. As a rule, the exchangeability of existing tube air diffusers of  $\varnothing 40/70$  mm is thus possible.

Specifications		
Total length, <b>b</b>	[mm]	<b>a + 1,652</b>
Total width, <b>c</b>	[mm]	207
Tie rod length	[mm]	<b>a + 176</b>
Weight	[Kg]	approx. 3.8

## Perforation

The distance between the pores is accurately defined and prevents coalescence of air bubbles already during the creation process.

Parameters of perforation / weight / buoyancy	
Perforation length of membrane	750 mm
Perforation surface of membrane	1,200 cm <sup>2</sup>
Weight per air diffuser unit	1.9 kg
Buoyancy forces per pair	30 N

## Materials

All materials used have especially been selected for the application in the field of sewage treatment. The support body as well as the frame structure are manufactured as injection moulded article of environmentally friendly polypropylene.

The EPDM membrane is produced under optimum vulcanizing conditions as a high-quality moulded article.

The membrane material is of special importance with regard to the non-ageing property.

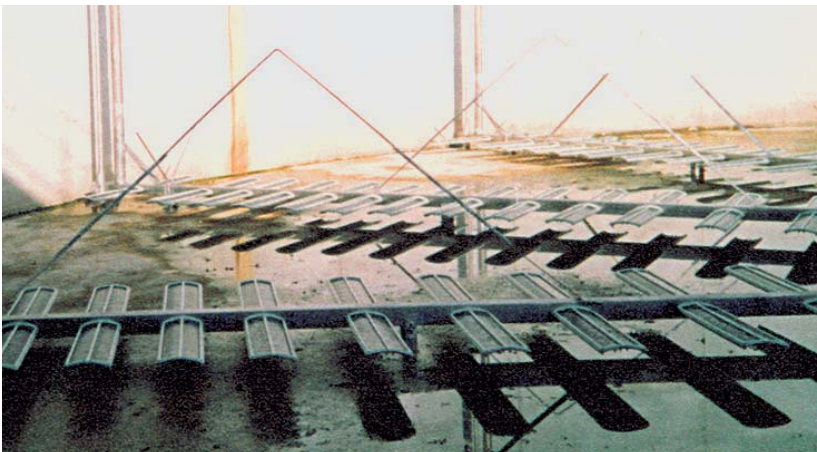
**EPDM** EPDM membrane with extremely low plasticizer content

**EPDM-MB** EPDM membrane of microbes resistant design; reduced affinity as to biological sedimentation due to a special cross-linked additive.

Materials parameters	
Support body	Glass-fibre
Membrane	Standard: EPDM Optional: EPDM-MB resistant to microbes
Sealing ring	NBR
Tie rod	1.4404
Fixing screws	Stainless steel
Aeration grid	Stainless steel

## Installation

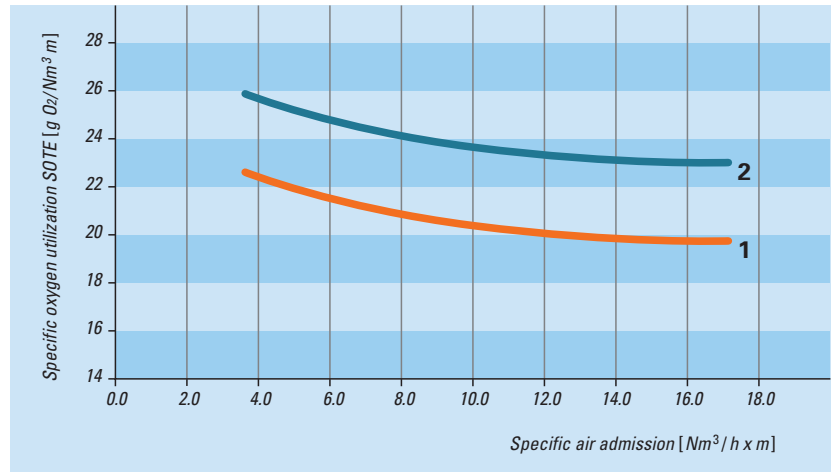
The air diffusers are normally mounted in pairs on rectangular or square aeration grids.



## Oxygen admission capacity

Apart from a great number of influencing factors, the degree of oxygen utilization is also highly dependent on the deposit density in the aeration basin under consideration. The presentation concerns an area-type aeration in clean water under normal conditions. In order to document the influencing factors of the deposit density, we have taken into account a different number of air diffusers per m<sup>2</sup> of basin surface.

- 1 = 0.85 m air diffuser length/m<sup>2</sup> of basin bottom
- 2 = 2.20 m air diffuser length/m<sup>2</sup> of basin bottom

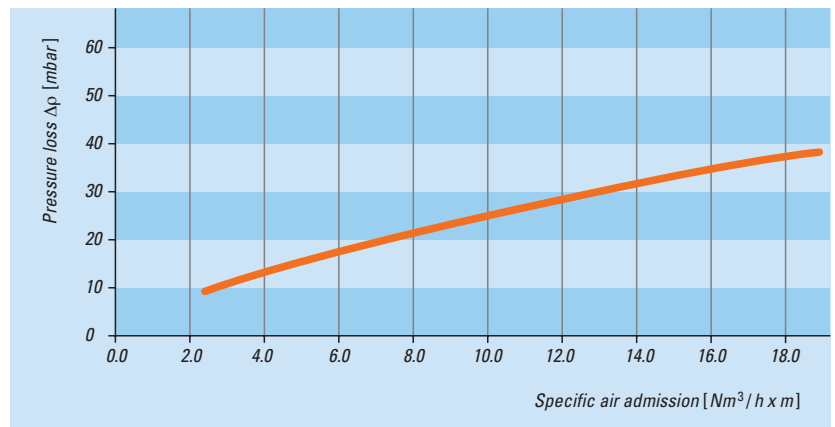


Oxygen utilization in clean water, ELASTOX®-P

## Pressure loss

The following diagram indicating pressure loss has been determined based on a blow-in depth of 3.8 m. In case of optimum equipment with a check valve, the pressure loss is increased by approx. 10 %.

The mentioned data refer to all membrane qualities out of EPDM. The pressure loss of the silicone membrane lies in the new condition slightly more highly.



## Rating admission value

For the design of aeration systems, a rating admission value of 12 Nm<sup>3</sup>/h x m of an air diffuser is specified. For service test operation purposes for a limited time, admissions up to 18 Nm<sup>3</sup>/h x m of an air diffuser are permitted.