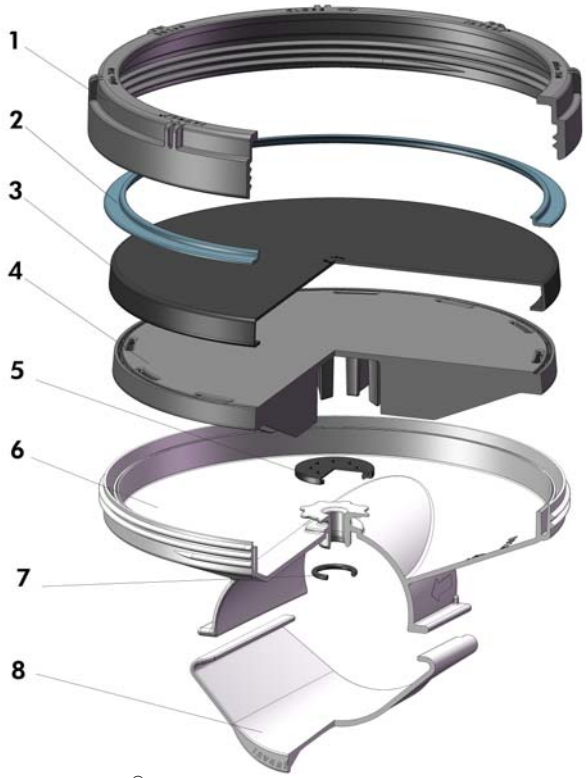
*i*DISC®- Membrane Diffuser

30 years of experience in the aeration field lead **INVENT** to develop the ***i*DISC**®- Membrane Diffuser. The innovative concept of the ***i*DISC**®- Membrane Diffuser is the combination of sophisticated design and the robust construction resulting in its capability to operate over a wide air flow range whilst achieving high SOTE. This will assist most wastewater treatment plants around the world to reduce their energy consumption and thus to reduce their operating cost.

Every detail makes a difference !

Design

The ***i*DISC**®- Membrane Diffuser design was driven by fluid mechanical and mechanical strength considerations. It consists of a main diffuser body which attaches to the air pipe by a sturdy saddle connection which is secured with a wedge clamp. The flexible membrane sits on a rigid membrane support. They are integrated into the diffuser body and secured in place by a retaining ring.



***i*DISC**®- Membrane Diffuser – Exploded View

1 Retaining ring

The retaining ring is made from heavy duty GRP.[1] It has oversized threads that makes it easy to open and close even after many years of operation.

2 Anti friction ring

The anti friction ring is made from fatigue resistant low friction Polyacetal. It is installed between the membrane and the retaining ring to avoid contact and ease the membrane change even after years of operation.

3 Membrane

In order to achieve a reliable and energy-efficient design the membrane is produced using a proprietary EPDM[2] rubber compound, specifically formulated for wastewater aeration duties. The membrane is perforated with slits to form fine bubbles. The slit geometry and pattern is designed to allow a wide range of airflow rates.

4 Membrane support

This component is made from heavy duty rigid GRP provides 3 essential functions:

- A flat surface on which the membrane rests during periods of no aeration.
- Homogeneous air distribution to the membrane periphery.
- Integrated cross sectional rigidity allowing the diffuser to operate in very deep basins

5 Non return valve

The ***i*DISC**®- Membrane Diffuser has an independent non return valve made from EPDM integrated into the diffuser body.

6 Diffuser body

The diffuser body is a sturdy construction made from a single piece of heavy duty GRP. The diffuser body sits low on the air distribution pipe maximizing the available aeration depth.

7 O-Ring

The O-Ring, made from NBR[3], provides the seal between diffuser body and air distribution pipe.

8 Wedge clamp

The wedge clamp is made from heavy duty GRP. It has the function to mechanically secure the diffuser body to the air distribution pipe without using adapter or glue.

[1] GRP: Glass Fiber Reinforced Plastic

[2] EPDM: Ethylene Propylene Diene Monomer

[3] NBR: Nitrile Butadiene Rubber

The complete *i*DISC® - Aeration System

*i*DISC® - Aeration System Design
The complete ***i*DISC®** - Aeration System consists of the **INVENT** process design, all air distribution piping at the bottom of the tank including connection joints, adjustable pipe saddles, stainless steel anchors, condensate drainage system, and the ***i*DISC®** - Membrane Diffusers. The system is delivered in prefabricated components. This makes the installation in the field safe, easy and fast.

Process Design
INVENT provides a complete process design to ensure sufficient oxygen transfer under different operational scenarios, including diffuser layout, air piping design within the basin, and blower design.

*i*DISC® - Membrane Diffuser Assembly
The ***i*DISC®** - Membrane Diffuser Assembly is supplied pre-assembled and tested on its air distribution pipe. The system design is in such a way, that no glue is used for the installation.

Connection Joints
The connection between each ***i*DISC®** - Membrane Diffuser Assembly is done with joints which allow the pipes to expand and contract due to temperature changes. The joints do not need any glue thus are easy to assemble.

Adjustable Pipe Saddles
The ***i*DISC®** - Aeration System is fixed to the bottom of the basin with height adjustable pipe saddles made from GRP or stainless steel. The pipe saddles are fixed to the bottom with wedge anchor bolts or drop-in anchors. The air distribution pipes are locked to the saddle with plastic straps.

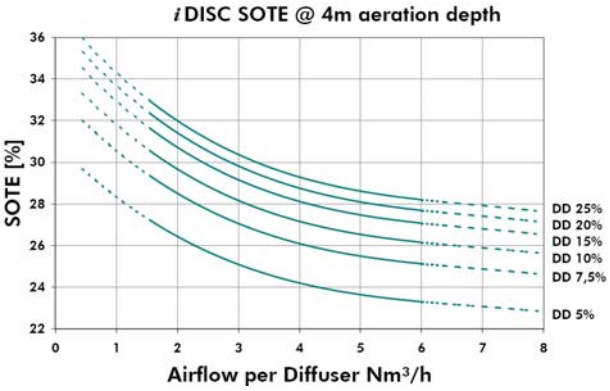
Condensate Drainage
The ***i*DISC®** - Aeration System is designed as Closed Loop System. The outer end pipe collects the condensate water from every air distribution pipe. The drainage coupling drains the condensate water accumulating in the piping system above the water surface of the basin.

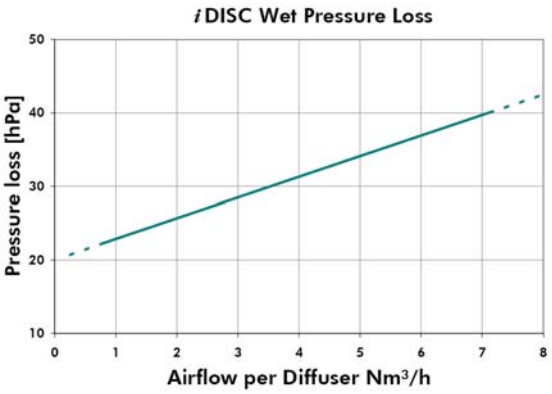
Quality Control
Each ***i*DISC®** - Membrane Diffuser is exposed to pressure tests to verify that they are air and water tight, and within the acceptable range of pressure loss.

Cleaning system
To maintain a low operation cost for the aeration systems it is important to keep a constant low wet pressure loss. An optional unit to add formic acid to the drop leg during the operation can be used to clean the membranes.

Technical Data

Airflow Rate[4]	1 – 8 Nm^3/h/diffuser
Membrane Diameter	237 mm
Active Surface Area	0,044 m^2
Bubble diameter	1 – 3 mm
Performance (SOTE[5])	6,50 – 8,50 %/m
Pressure Loss	22 – 43 hPa
Diffuser Density (DD)	5 – 30%





[4] at Norm conditions (0°C and 1,013 mbar)
[5] SOTE: Standard Oxygen Transfer Efficiency

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