

OXYFLEX[®] - MT235 / MT300 MEMBRANE DISC DIFFUSER



Supratec

GESELLSCHAFT FÜR UMWELT-
UND VERFAHRENSTECHNIK MBH

AERATION TECHNOLOGY

von-Drais-Straße 7
D-55469 Simmern / Hunsrück

Tel.: +49 6761 / 9 65 09-00
Fax: +49 6761 / 9 65 09-01

e-mail: info@oxyflex.de
internet: www.oxyflex.de

OXYFLEX® - MT235 / MT300

MEMBRANE DISC DIFFUSER

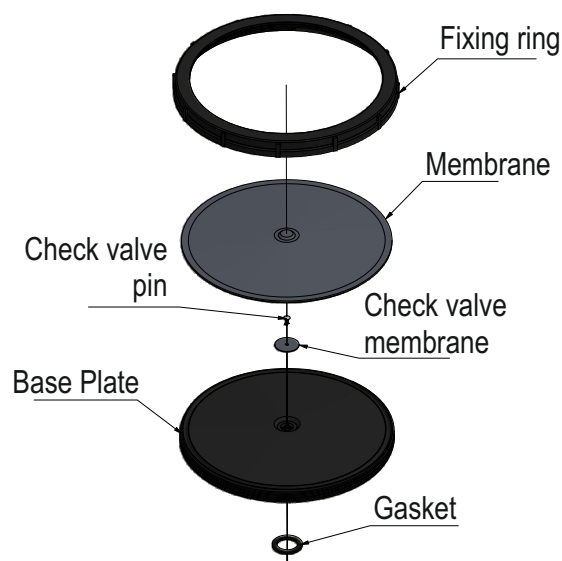
DESIGN

OXYFLEX® - MT Membrane Disc Diffusers consist of a flat, heavily ribbed base plate with male threaded air socket. The membrane is tightly fixed at this base plate by a fixing ring. Base plate and fixing ring are made of fibreglass-reinforced polypropylene.

The Membrane Disc Diffuser OXYFLEX® - MT is available in two sizes:
OXYFLEX® - MT 235 – 9"-disc diffuser having 0,04m² membrane area and
OXYFLEX® - MT 300 – 12"- disc diffuser having 0,07m² membrane area.

Each of those membrane disc diffusers are supplied with a strong 1"-male thread as standard, but are also available with a ¾"-male thread on request. For installation on round pipes, additional clamp saddles can be supplied with different diameters.

An additional check valve is included by default as well.



MEMBRANE OPTIONS

OXYFLEX® - MT membrane disc diffusers are equipped with robust EPDM membranes.

For very special requirements, the OXYFLEX® MT300 is also available with silicon membranes or EPDM membranes with PTFE-coating.

All OXYFLEX® - MT membrane disc diffusers are available as fine and coarse bubble diffusers.



PRODUCT CHARACTERISTICS

In contrast to round membrane tube diffusers, the entire diffuser surface of membrane disc diffusers is at the same hydraulic level. Therefore complete membrane surface is more homogenously active. As a result, efficiency and service life is optimised in comparison to standard tube diffuser versions.

PRODUCT PERFORMANCE

OXYFLEX® - MT membrane disc diffusers can be installed on plastic or steel pipes. They can be used for all tank shapes, but they are particularly recommended for smaller tank areas.

OXYFLEX® - MT membrane disc diffusers have proved successfully in municipal and industrial plants in all parts of the world. For maintenance purpose membranes can be replaced.

OXYFLEX® - MT membrane disc diffusers can be operated intermittently and have a broad working range (compare table 1).

OXYFLEX® - MT300

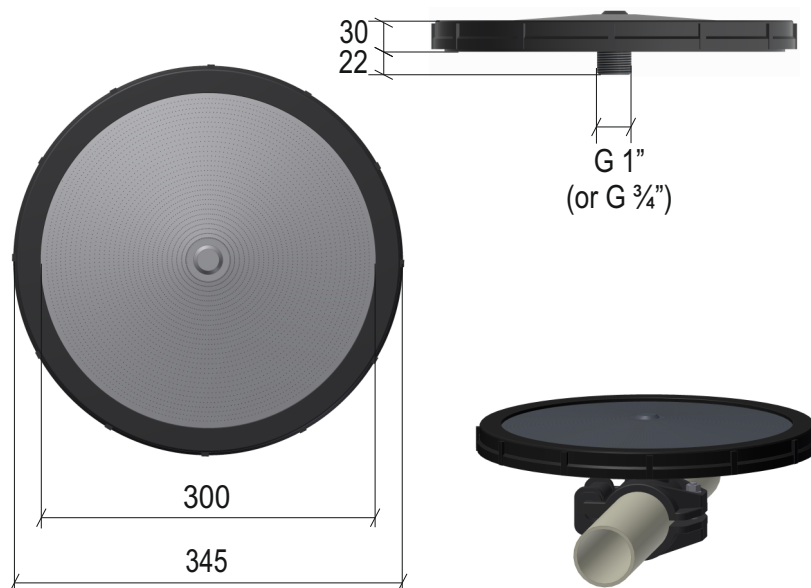
Design

Air connection: G 1" (G ¾") male thread
Outer diameter: 345 mm
Membrane area: 0,07m²

Materials

Base plate and
fixing ring: Polypropylene
(PP-GF)
Membrane: EPDM
Gasket: EPDM

The recommended minimum
distance between the connection
holes on the distribution pipe is
360 mm.



OXYFLEX® - MT235

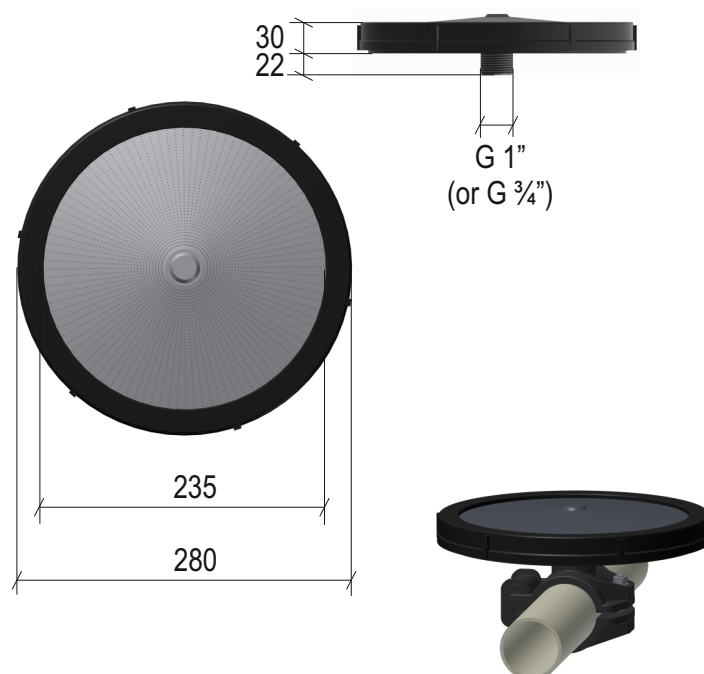
Design

Air connection: G 1" (G ¾") male thread
Outer diameter: 280 mm
Membrane area: 0,04m²

Materials

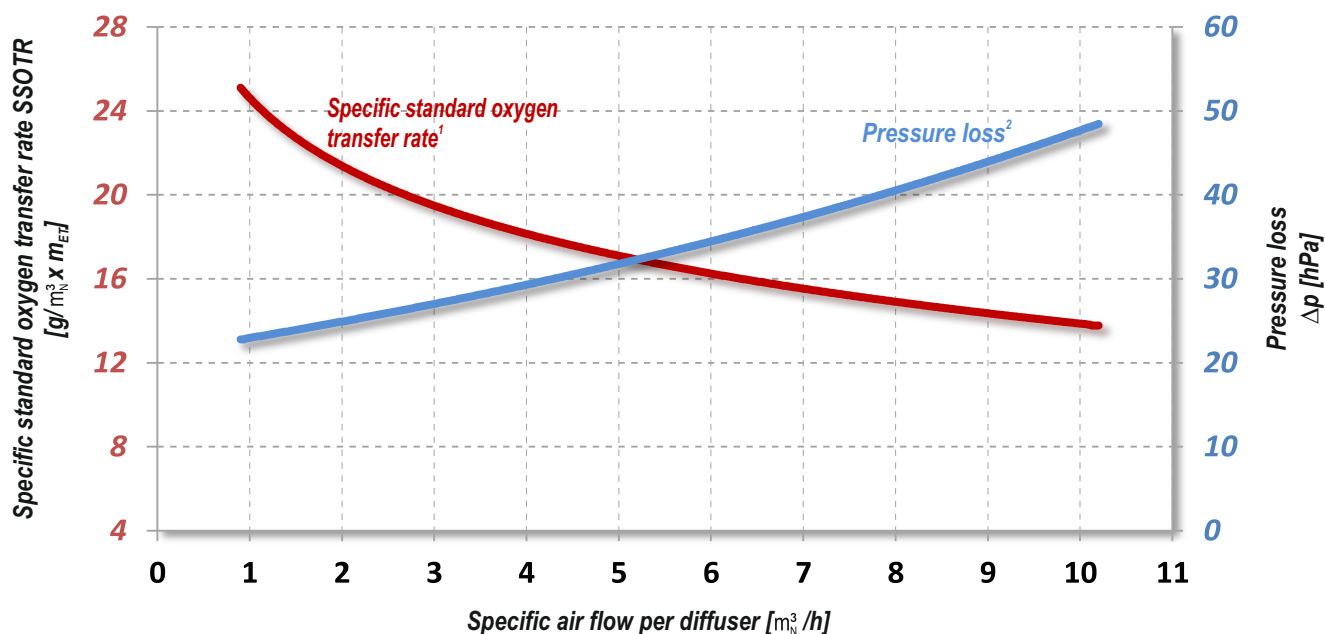
Base plate and
fixing ring: Polypropylene
(PP-GF)
Membrane: EPDM
Gasket: EPDM

The recommended minimum
distance between the connection
holes on the distribution pipe is
295 mm.

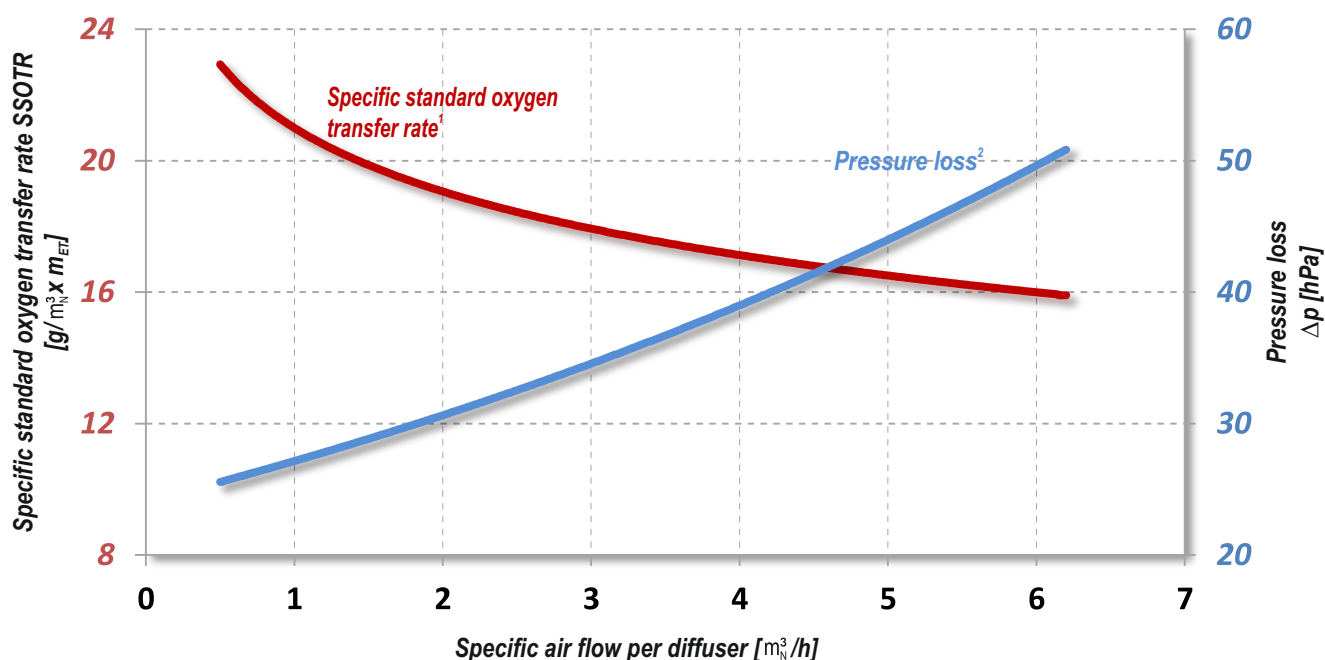


PERFORMANCE

Specific standard oxygen transfer rate and pressure loss
OXYFLEX® - MT300



Specific standard oxygen transfer rate and pressure loss
OXYFLEX® - MT235



¹ This diagram shows an exemplary test result; values are dependent on several influencing factors based on each individual project. These values cannot be used in order to derive warranty claims of any kind. We will be pleased to prepare a specific technical proposal for individual application for you on request.

² Shown pressure losses consider installation with 1"-thread connection (without clamp saddle)

INSTALLATION INSTRUCTIONS

STORAGE

The diffusers should be stored in a dry and ventilated room (in their original packaging). DIN 7716 provisions must be observed.

PREPARATION

Prior to installation it must be ensured that the pipes are clean. All drilling chips, dirt, etc. must be removed, otherwise they will cause mechanical damages of diffusers when the blower is started.

LEVELLING

The OXYFLEX® - MT membrane disc diffuser is mounted on distribution pipes that must be levelled. A difference ± 10 mm shall normally not be exceeded.

INSTALLATION

OXYFLEX® - MT membrane disc diffusers are installed on distribution pipes by using the male threaded air connection.

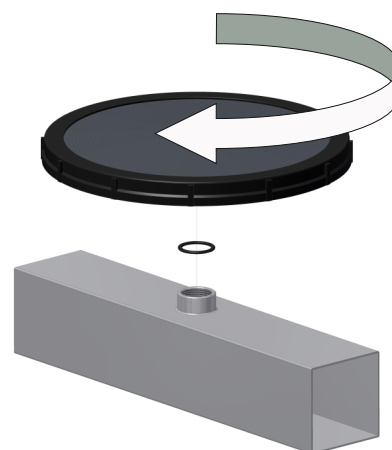
CONNECTION VIA SOCKET

Distribution pipes must be equipped with suitable connections, resp. threaded sockets.

OXYFLEX® - MT membrane disc diffusers are mounted by screwing the male threaded air socket of the diffuser base plate directly into existing sockets.

The diffuser must be mounted firmly, horizontally and airproofed. A flat EPDM-gasket (supplied together with diffuser), is used between diffuser and socket. If the flat gasket is unsuitable for existing socket, the thread connection must be sealed with a suitable sealing material on site.

The gasket must be clean and undamaged.



CONNECTION VIA CLAMP SADDLE

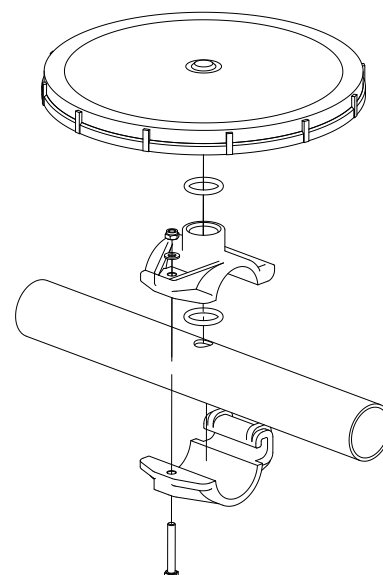
For mounting on round pipes SUPRATEC clamp saddles can optionally be used.

Bore holes are drilled in a central position on top of the round pipe.

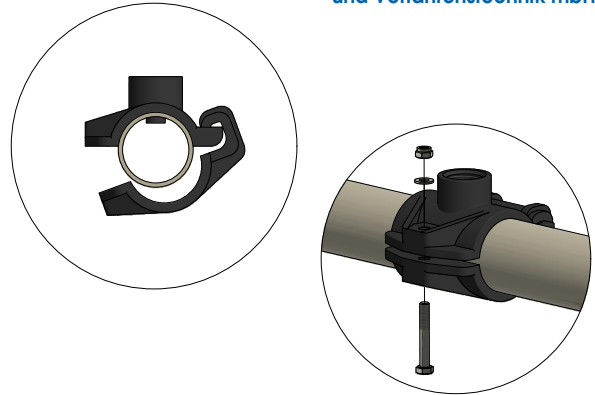
An O-ring made of EPDM is inserted between the upper part of the clamp saddle and the distribution pipe. The gasket between the diffuser and the pipe must be clean and undamaged.

The supply air pipe connection $\varnothing = 16$ mm (standard) in the top part of the clamp saddle has to be inserted from above into the bore hole $\varnothing = 20$ mm of the distribution pipe.

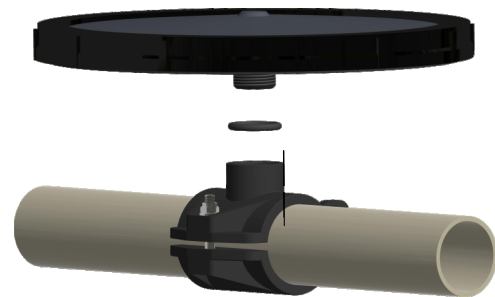
(For smaller existing bore holes clamp saddles with supply air pipe connection $\varnothing = 13$ mm are available on demand).



The hinge of the lower part of the clamp saddle is hooked into the upper part. Now the clamp saddle is closed and fixed by using a M8 mm hexagon screw, a washer and a self-locking nut (7 Nm). To avoid seizing the thread of each hexagon screw has to be lubricated previously.



Before installing the diffusers by screwing them into the female thread of clamp saddle, it has to be insured that a flat gasket (EPDM), supplied together with diffuser, is used between diffuser and clamp saddle. The gasket must be clean and undamaged. Always make sure that the diffuser is mounted firmly, horizontally and airtight.



Possible pipe dimensions for available clamp saddles:

For stainless steel pipes: DN 50 / Ø 60,3 mm (additional spacer is required), DN 65 / Ø 76,1 mm, DN 80 / Ø 88,9 mm

For plastic pipes (outside Ø): DA 63 mm / DA 75 mm / DA 90 mm / DA 110 mm

(Further sizes are available on request)

OPERATION INSTRUCTIONS

FUNCTIONAL CHECK AND LEAKAGE CHECK

After the OXYFLEX® - MT membrane disc diffusers have been installed, a functional and leakage check must be performed. In order to do this, fill the tank up to a level of approx. 10 cm above the top edge of the diffuser with clean water. It is recommended to operate with minimum air amount (compare table 1), before the water level reached the aeration grid, in order to avoid water ingress by some bad sealing.

To check the function visually, the diffusers are loaded with the specified amount of air in accordance with the diffuser version (compare table 1).

After ensuring that all diffusers function properly, the air quantity is reduced in accordance with the diffuser version (compare table 1) in order to make it easier to perform the leakage check. Rising large bubbles indicate leaks (e.g. due to missing or slipped gaskets) those must be remedied.

The successfully performed functional and leakage check must be documented and the water level must be increased to at least 100 cm above the top edge of the diffusers with clean water as quickly as possible. If immediate commissioning is planned, the tank can also be filled directly with waste water.

The compressed air must not be turned off between the function and leak-tightness check and the run-in of the diffusers.

A suitable procedure has to be clarified with Supratec with regard to liftable systems.

DIFFUSER RUN-IN

After successful functional- and leakage check and before normal operation diffusers should be operated continuously for at least 60 hours in clean or waste water with the specified specific load (see run-in of diffusers in table 1).

COMMISSIONING

After diffuser run-in, the aeration system can be commissioned.

After successful commissioning, a reference pressure loss measurement enables the evaluation of current state of aeration system in operation.

If commissioning is delayed and/or system is decommissioned later on, it must be ensured that the diffusers are sufficiently covered by water (at least 100 cm) so that the OXYFLEX® - MT membrane disc diffusers are protected against strong sun, frost and mechanical damage caused by falling objects, for example.

BUBBLE PATTERN

The bubble pattern should be assessed not before the above-described run-in of the diffusers has been completed.

For this purpose the diffusers are operated from the maximum down to the minimum specific load.

The evenness of the aeration (bubble pattern test) should be checked when the tank is filled to a level of at least 100 cm of water above the diffuser top edge.

Checking the evenness of the aeration system is only possible at a water temperature of above 10°C.

OXYGEN TRANSFER TEST

Prior to carrying out an oxygen transfer test as proof of the efficiency of the OXYFLEX® - MT membrane disc diffuser, the above-mentioned steps must have been completed.

The oxygen transfer test can be carried out in accordance with the accepted regulations (e.g. DIN EN 12255-15:2003 or DWA-M 209) using the fresh water or waste water method. Specified warranty values must be rigorously adhered to calibrated and exact measurement of the air volume is required.

Diffuser version	fine bubble		coarse bubble	
	MT300	MT235	MT300	MT235
leakage check	0,5	0,5	0,5	0,5
Functional check / Diffuser run -in	6	3	13	10
Bubble pattern (starting with higher specific load)	3 - 10	2 - 6	6 - 16	7 - 13
Minimum specific load	1	0,5	6	4
Nominal operating range	2 - 10	1 - 5	7 - 16	5 - 12
Maximum continuous load	10	6	18	13
Maximum short time load / maintenance load	12	7	20	15

Table 1: Specific loads [m^3/h per diffuser] for OXYFLEX® - disc diffuser with EPDM membrane

MAINTENANCE INSTRUCTIONS

MAINTENANCE CYCLE

The OXYFLEX® - MT membrane disc diffuser is a low-maintenance system and is partly self-cleaning due to different specific air loads during the normal operating cycle.

Especially with an intermittent operation mode, the normal operation cycle can be used for parallel maintenance as described below. Depending on the operating conditions we recommend an appropriate additional maintenance cycle. This maintenance cycle is also used for removing deposits after longer periods of inactivity and long-term operation with low specific loads. We recommend daily and no less than weekly maintenance loading in accordance with the diffuser version (see table 1 on page 7) of approx. 15-30 minutes.

MONITORING

The bubble pattern and the pressure loss should be checked and documented at regular intervals under similar operating conditions (such as water level and air quantity). The pressure loss development in the load-dependent, seasonal comparison makes it possible to evaluate the condition of the aeration system objectively.

In the event of significant changes of the bubble pattern (e.g. partial massive large bubbles instead of homogenous fine bubble pattern) and/or increase of pressure loss of the system (for more than 40 hPa compared to commissioning), Supratec should be consulted immediately. Particularly in the case of systems that are operated intermittently, there is a risk that damaged diffusers can allow the ingress of sludge into the entire pipework system. This will adversely affect the function and service life of all diffusers.

CLEANING

The condition of the diffusers must be checked whenever the tank is emptied. Particular attention must be paid to soiling (deposits, sludge, coverings etc.), which can usually be easily removed from the membranes. Depending on the type and composition of the soiling, one of the following methods or a combination of several methods might be required. Testing for compatibility and successful results must always be carried out first on individual membranes (particularly with alkalis and acids). We recommend:

- Manually: Cleaning with water and a soft brush is often sufficient for removal of existing deposits. During manual cleaning, a continuous air flow is required. We recommend to operate the diffusers acc. to "functional check" (compare table 1).
- Alkaline solutions: Diluted alkaline cleaning agents can usually be used to help with manual cleaning.
- Acids: Recognizing pressure increase, dosing of diluted acids in to the compressed air can be required in order to clean the membranes (compare below information)

ACID DOSING

In systems in which limescale deposits are to be expected, we recommend that these systems are cleaned with diluted acid ($\leq 85\%$ formic acid for EPDM and Silicone membranes) at regular intervals. If necessary, diluted acid is metered into the compressed air in order to minimise the pressure loss of the membrane and increase the service life of the diffuser. For this purpose, we offer a mobile dosing station for perfectly metered cleaning.

Please contact Supratec for further information about acid dosing.

We reserve the right to make technical alterations.

For current version please check our website www.oxyflex.de

