BELÜFTUNGSTECHNIK
UMWELT- & VERFAHRENSTECHNIK
SERVICE & WARTUNG

OXYFLEX® - MF 650
MEMBRANE-PLATE-DIFFUSER

Supratec

GESELLSCHAFT FÜR UMWELT-
UND VERFAHRENSTECHNIK MBH

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Gesellschaft für Umwelt-
und Verfahrenstechnik mbH

GENERAL INFORMATION

OXYFLEX® - MF650
MEMBRANE-PLATE-DIFFUSER

GENERAL INFORMATION

Supratec Gesellschaft für Umwelt- und Verfahrenstechnik mbH [Supratec company for environmental and process technology] manufactures modern high-efficiency aeration systems which are used primarily for the oxygen supply in biological waste water purification processes. The products can similarly be used for the gasification of all types of liquids.
Possible areas of application for the Supratec aerators are
- Municipal Waste Water Treatment plants
- Industrial Waste Water Treatment plants
- Special technical processes, such as the 'stripping' of gases, etc.

DESIGN

Membrane aeration units (plate, tube and disc) with plastic body are distributed under the market name of OXYFLEX®. The OXYFLEX® - MF650 membrane plate diffuser has external dimensions of 675 x 215 mm (length x width). The load-bearing structure is formed by a fibreglass reinforced polypropylene plate. The membrane is fastened to this plate by two plastic frames arranged symmetrically.

MEMBRANE

EPDM is delivered as the standard membrane. Membranes made from thermoplastic polyurethane (TPU) are also available.
The membranes are endowed with a special slot-arrangement. The size and arrangement of the slots are designed such that they achieve optimum oxygen transfer efficiency.

CHARACTERISTICS

The particular characteristics of the OXYFLEX® - MF650 membrane plate diffusers arise from their shape and material selection. The OXYFLEX® - MF650 membrane plate diffuser impresses with:
- High oxygen transfer efficiency
- Low pressure loss
- Slot-arrangement adapted to every situation
- Simple cleaning of the membranes and thus...
- Low maintenance operation

The OXYFLEX® - MF650 membrane plate diffuser is largely impervious to dirt and produces fine gas bubbles with a diameter of approx. 2 mm.

PERFORMANCE

The OXYFLEX® - MF650 membrane plate diffuser has a large operating envelope of up to 12 Nm³/h per diffuser. Specific oxygen transfer efficiency levels of over 25 g O_2 /Nm³ x m are possible in pure water with a flat arrangement and optimum water depths! Because, in contrast to tube aerators, the complete aerator surface is at an even hydraulic level the membrane gases evenly over the complete working area. This results in an optimisation of not only the service life but also the performance. The OXYFLEX® - MF650 membrane plate diffuser is suitable for installation on stainless steel and plastic piping and can thus be used in almost any type of tank. Naturally, the OXYFLEX® - MF650 membrane plate diffuser can also be operated intermittently. In addition, with a sufficiently large surface area and by using "Air-pulsing" - short aeration intervals - an agitator can be omitted because in a combi-tank this process prevents activated sludge settling, even during dentrification.
(Further information on "Air-pulsing" is available on request)

VARIANTS

The OXYFLEX® - MF650 membrane plate diffuser can likewise be manufactured as a coarse bubble diffuser.

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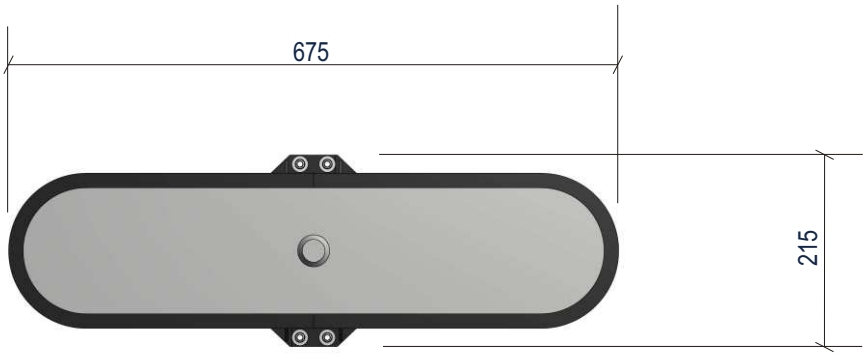
TECHNICAL DETAILS

OXYFLEX® - MF650

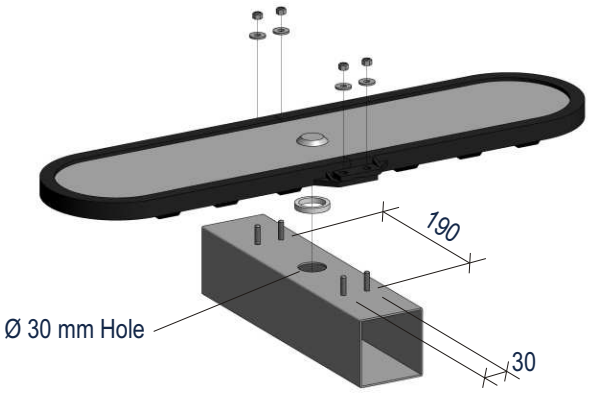


OXYFLEX® - MF650 'B'

The type "B" OXYFLEX® - MF650 is fastened with 4 threaded M6 x 22 mm bolts which are welded on the rectangular pipe (width min. 60 mm!). The bolts distance is 190 x 30 mm - see figure. The Ø = 29 mm supply air pipe socket is then fed from above into the Ø = 30 mm hole and fastened by means of the threaded bolts that now project from above and the self-locking M6 (8 Nm) nuts.

Materials:

Body:	Polypropylene (PP-GF)
Frame:	Polypropylene (PP-GF)
Gasket:	EPDM
Membrane:	EPDM
	Thermopl. polyurethane (TPU)
Membrane surface:	0.1 m²



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TECHNICAL DETAILS

OXYFLEX® - MF650 'AS'

The type "AS" OXYFLEX® - MF650 is fastened with a clamp. The clamp has a joint in order to facilitate it folding and is inserted from above into the Ø = 16 mm hole provided with the Ø = 20 mm supply air pipe socket. Now the clamp is closed and screwed tight with a M8 x 65 mm (10 Nm) hexagonal bolt and a self-locking nut.

Possible dimensions for the round tube distributor:
Stainless steel version: DN 50 / 60,3 mm, DN 65 / 76.1 mm, DN 80 / 88.9 mm
Plastic version: DA 63 mm / DA 75 mm / DA 90 mm / DA 110 mm
(further sizes on request)

Materials:

Body:	Polypropylene (PP-GF)
Frame:	Polypropylene (PP-GF)
Clamp:	Polypropylene (PP)
Gasket:	EPDM
Membrane:	EPDM
	Thermopl. polyurethane (TPU)

Membrane surface: 0.1 m²

OXYFLEX® - MF650 'SA'

The type "SA" OXYFLEX® - MF650 is fastened with a side adapter to the square distributor tubing. The side adapter is inserted sideways into the Ø 38-45 mm hole provided and screwed to the side opposite with the counterpart and an M10 (9 Nm) hexagonal bolt passing all the way through.

Possible dimensions for the square distributor:
Height: 80 mm or 100 mm
Width: 60 mm - 120 mm
(further sizes on request)

Materials:

Body:	Polypropylene (PP-GF)
Frame:	Polypropylene (PP-GF)
Clamp:	Polypropylene (PP)
Gasket:	EPDM
Membrane:	EPDM
	Thermopl. polyurethane (TPU)

Membrane surface: 0.1 m²

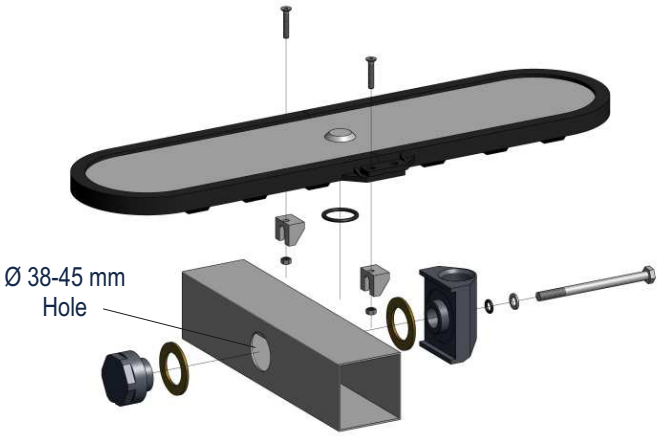

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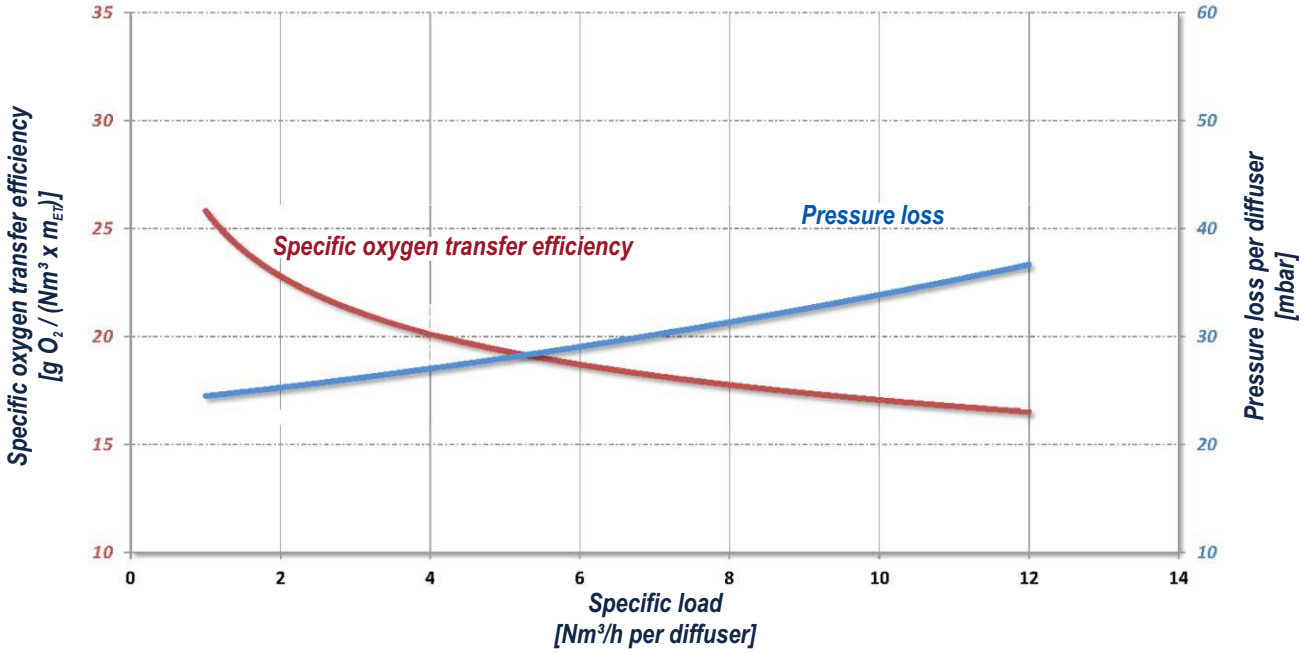
DIAGRAM - OXYGEN TRANSFER EFFICIENCY

OXYFLEX® - MF650
MEMBRANE-PLATE-DIFFUSER

The OXYFLEX® MF650 membrane plate diffuser is a high-efficiency aeration element that is used primarily for the oxygen supply in biological waste water treatment plants.
Alongside the process-related essentials, the performance characteristics of a product are important criteria for the selection of suitable fine bubble aeration technology.
The OXYFLEX® MF650 membrane plate diffuser is selected through having the appropriate performance level for the respective project, optimally configured for the best compromise between investment costs, operating costs and control range.
The following diagram shows the results of an investigation into oxygen transfer efficiency as an example. The values were determined in a rectangular tank with a water depth of 4.0 m, a diffuser blow-in depth of 3.8 m and a diffuser arrangement density of 12%.

Specific oxygen transfer efficiency and pressure loss of the OXYFLEX® -MF650 membrane plate diffuser



The values cannot be transferred to other systems! The results shown here are dependent on several influencing factors such as the shape of the tank, the diffuser arrangement density or a separate circulation caused by a supplementary agitator.

Supratec gladly prepare a technical datasheet for each individual case of application upon request.

Warranty claims cannot be derived from the diagram!

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ASSEMBLY INSTRUCTIONS

OXYFLEX® - MF650
MEMBRANE-PLATE-DIFFUSER

DESCRIPTION

The OXYFLEX® -MF650 membrane plate diffuser is comprised of a flat, heavily ribbed fibreglass reinforced polypropylene carrier plate surrounded by a membrane (e.g. EPDM).
The two-part frame of fibreglass reinforced polypropylene holds the membrane securely on the carrier plate. This frame has a lug at each side with holes drilled in each. The carrier plate has a Ø 29 mm connection nozzle.
With the type "AS" OXYFLEX® -MF650 membrane plate diffuser the upper part of a clamp is welded onto the carrier plate.
The type "AS" OXYFLEX® -MF650 membrane plate diffuser is fastened to the round distribution line with the lower part of this clamp. The fastening of the clamp is implemented with bolted connections.

DIMENSIONS

Width: 215 mm, Length: 675 mm, Height: 21 mm (with rounded corners)
Free membrane surface: 650 mm, Width: 150 mm (0.1 m²)
(clamp not taken into consideration in the dimensions)

STORAGE

The diffusers should be stored in their packaging in a dry, ventilated room.
Observe DIN 7716.

PREPARATION

Before installing the OXYFLEX® -MF650 membrane plate diffuser the pipework should be checked to ensure that it is clean. Swarf, dirt etc. must be removed as otherwise this could be transported into the diffuser when the fan is started up and this could cause considerable impairment / damage to the diffuser.

LEVELLING

The OXYFLEX® -MF650 membrane plate diffuser is installed on the distribution pipework. The pipework should be levelled to within ± 10 mm.

INSTALLATION

The fastening of the type "AS" OXYFLEX® -MF650 membrane plate diffuser is implemented with clamps on the round tubing made from stainless steel or plastic, with a minimum outside diameter of DN 50 or 63 mm in the case of plastic tubing.
A Ø 20 mm hole must be provided centrally on the top side of the tube. The position of the diffuser is marked with the help of a template. Then the "AS" OXYFLEX® -MF650 membrane plate diffuser is fitted per the marking and the clamp is tightened firmly. Care must be taken to ensure that the diffuser is sitting horizontally. The O-ring seal made from EPDM must sit between the diffuser and the tube, clean and undamaged.

The type "B" OXYFLEX® -MF650 membrane plate diffuser is installed on a square distributor. This distributor is provided with a Ø 30 mm hole and 4 M 6 x 22 mm threaded bolts. The carrier plate connection nozzle is inserted into the hole and the threaded bolts fit in the holes on the side lugs of the two-part frame. The type "B" OXYFLEX® -MF650 membrane plate diffuser is bolted to the distributor with self-locking nuts.
Make sure that the diffuser is sitting horizontally and is firmly fastened. A flat seal made from EPDM is inserted between the diffuser and the distributor. The surfaces must be clean and undamaged.

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OPERATION INSTRUCTIONS

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FUNCTION AND LEACKAGE CHECK

After the OXYFLEX® -MF650 membrane plate diffuser has been installed a functional check and leakage check should be carried out. To do so fill the tank up to a height of max. 10 cm above the upper edge of the diffuser with clean water and then feed air to the diffuser.
The sealing and function of the diffuser can now be checked and documented.

RUNNING IN THE DIFFUSER

After the functional check and leakage checks have been completed the OXYFLEX® -MF650 membrane plate diffuser must be run for at least 60 hours of continuous operation.
At the same time the water level should be increased as quickly as possible to at least 100 cm above the upper edge of the diffuser.

IMPORTANT: During this process the diffuser have to work continuously!

VISUAL BUBBLE CHECK

An evaluation of the bubble pattern should not be carried out until the diffuser has been run as described above. To do so the diffuser should be run from the maximum specific load through to the minimum specific load.
The checking of the uniformity of the aeration (visual bubble check) should be implemented with the tank filled with water min. 60-100 cm above the upper edge of the diffuser.
The checking of the uniformity of the aeration can only be carried out with a water temperature of more than 10°C.

OXYGEN TRANSFER EFFICIENCY TEST

The steps mentioned above must be carried out to implement an oxygen transfer efficiency test to verify the performance of the OXYFLEX® -MF650 membrane plate diffuser.
The oxygen transfer efficiency test can be carried out in accordance with recognised regulations (e.g. ATV guideline) per the pure water or waste water methods. Any guarantee values provided must be precisely adhered to. A calibrated and exact air quantity is essential.

COMMISSIONING

After the oxygen transfer efficiency test has been successfully completed the commissioning can be carried out. If the commissioning is delayed care should be taken to ensure that the diffuser is covered with sufficient water (at least 100 cm) in order to protect the OXYFLEX® -MF650 membrane plate diffuser from too severe solar radiation and / or frost.

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MAINTENANCE INSTRUCTIONS

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MAINTENANCE

The OXYFLEX® -MF650 membrane plate diffuser is low-maintenance. We recommend operation at maximum air flow for 30 minutes once per day where possible, however at least once per week as a minimum. In doing so each individual OXYFLEX® -MF650 membrane plate diffuser should be charged with the maximum air flow.
In order to implement this it may be sufficient to isolate individual strands. This also serves to remove deposits after longer periods of inactivity and long periods of operation at low specific loads.
We recommend a visual check of the condition of the OXYFLEX® -MF650 membrane plate diffuser every time the tank is emptied. Particular attention should be paid to deposition here.

MONITORING

The bubble pattern and the pressure loss should be checked and documented at regular intervals. In the event of a change in the bubble pattern and/or the pressure loss this should be discussed with Supratec immediately. In particular with systems employing intermittent operation there is a risk of activated sludge ingress into the whole pipe system if the OXYFLEX® -MF650 membrane plate diffusers are damaged. All OXYFLEX® -MF650 membrane plate diffusers would be affected by this in terms of function and service life.

WARRANTY

The warranty period from Supratec GmbH for the OXYFLEX® -MF650 membrane plate diffusers is 24 months in normal cases. This period starts with the defect-free acceptance. Damage and/or external influences are expressly excluded from the warranty. The warranty is void if the waste water sub-flows are primarily industrial in nature. In such cases Supratec GmbH must be requested to confirm the warranty.
Fault rectification within the warranty period must be determined through an acceptance procedure. After that a warranty period of two years will start for this particular service. If the original warranty outlasts the two year warranty for the fault rectification then of course the original warranty continues to be valid.
The Supratec GmbH general terms and conditions of sale and warranty provision apply. These can also be seen on the internet at www.supratec.cc.

ACID DOSING

With systems which may be subject to blockages caused by the formation of chalk deposits, we recommend regular cleaning with formic acid. For this we offer a dosing station for optimally metered cleaning.
If necessary diluted acid can be metered into the compressed air. In some circumstance the cleaning intervals can be extended and the pressure loss of the membranes reduced by this.
Information on acid dosing is available from Supratec.

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