Supratec

Gesellschaft für Umwelt-
und Verfahrenstechnik mbH

PERMOX®-R/BRANDOL® 60

STIFF-CAVERNOUS TUBE DIFFUSER

Supratec

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PERMOX® - R / BRANDOL® 60
STIFF-CAVERNOUS TUBE DIFFUSER

The cylinder (Ø 70 / 40mm) of the stiff - porous PERMOX® - R / BRANDOL® 60 tube diffuser is produced in three different lengths: 500 mm, 750 mm, 1.000 mm.
In this self-supporting structure the single cylinders will be clamped with a stainless steel tie rod (standard: AISI 304 and AISI 316, special materials are available on demand) on a square tube.

The aeration element itself is made of a quartzsand / synthetic resin mixture. This stiff - cavernous microstructure has a pore volume of 40% and an average pore width of 180 µm at a grain size of 600 µm.

The tube diffuser PERMOX® - R / BRANDOL® 60 convinces by:
- Low and stable pressure loss
- Immunity against soiling at an appropriate continuous feed
- Fine bubbled and efficient continuous aeration
- Low-maintenance operation

The PERMOX® - R / BRANDOL® 60 tube diffuser is suitable for a wide operating range with a continuous air feed of 2,3 – 12 mN^3 / h per meter length of the diffuser. The typical air feed should be between 7 ± 2 mN^3 / h per meter length of the diffuser. A short-time air feed of 25 mN^3 / h per meter length of the diffuser is possible.

The PERMOX® - R / BRANDOL® 60 tube diffuser has to be operated permanently with a minimum air flow of 2,3 mN^3 / h per meter length of the diffuser. So the penetration of slurry and the furring of the diffuser / the piping will be avoided.

The PERMOX® - R / BRANDOL® 60 tube diffuser achieves specific oxygen transfer rates of in clean water of up to 24 g O2 / mN^3 · mET (and above) at an aerial layout and advantageous water depths. Due to the stiff – cavernous microstructure of the PERMOX® - R / BRANDOL® 60 tube diffuser its efficiency remains over the whole operating range.

In researches of different independent institutes it has been proven that the performance of the PERMOX® - R / BRANDOL® 60 tube diffuser may become higher during operation, too.

Worldwide the PERMOX® - R / BRANDOL® 60 tube diffuser proved its worth successfully in urban and industrial facilities.

The PERMOX® - R / BRANDOL® 60 tube diffuser is suitable for all shapes of tanks, especially for large tank volumes and linear aeration.

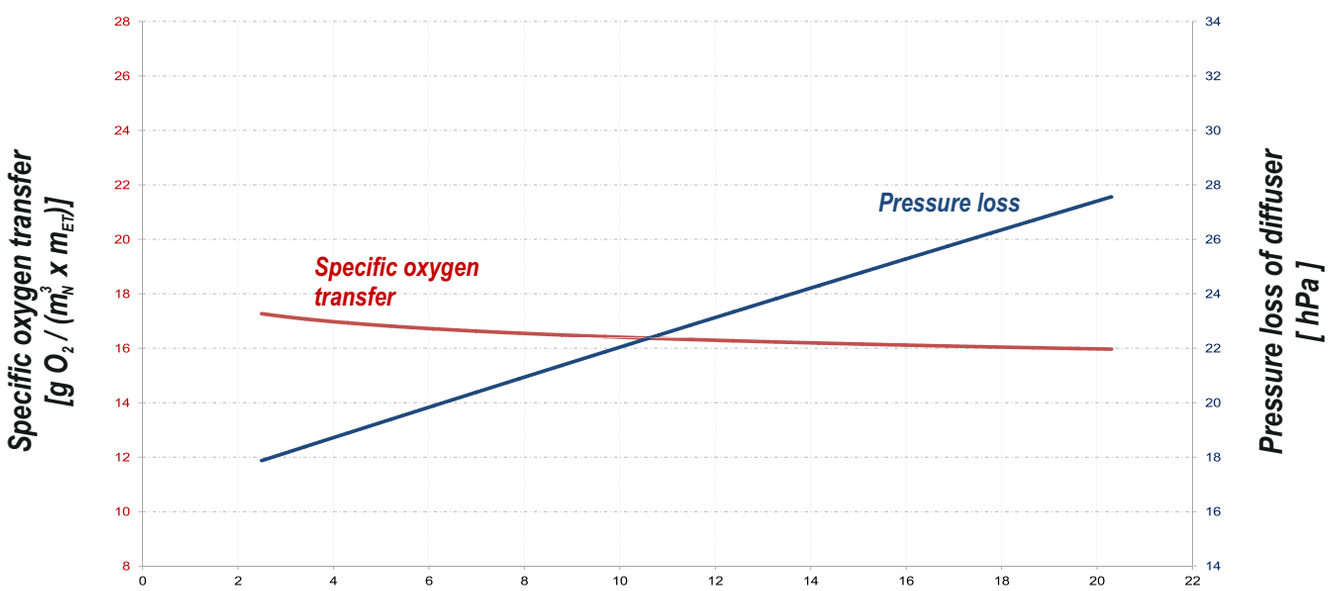
The stiff – porous PERMOX® - R / BRANDOL® 60 tube diffuser is a high – efficient aeration element, what is mainly used for the oxygen supply of biological wastewater treatment plants.

The diagram below shows the result of an oxygen transfer test. The values have been gained in a rectangular tank with working depth of the diffusers of 4 m and a diffuser coverage density of 15%.

Those values are not transferrable on other plants, because the named results are depending on several parameters, e.g. the tank shape, the diffuser working depth, the diffuser coverage density or a separate recirculation.

SUPRATEC® will provide you on request a technical datasheet for your personal application.

Specific oxygen transfer and pressure loss of the
PERMOX® - R / BRANDOL® 60



***Specific airload of* PERMOX® R - Brandol® 60**
[m_N^3 /h per m diffuser length]

From the diagram above no warranty claims may be deducted.

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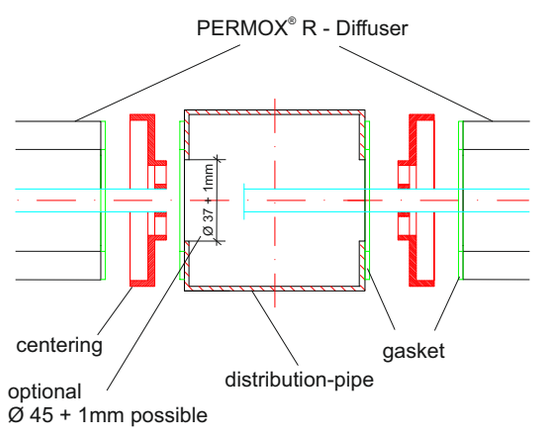
INSTALLATION INSTRUCTIONS

Storage:
The diffusers have to be kept in their packaging in a dry, frost- and dust protected ventilated room.

Preparations:
Prior to the installation of the stiff – porous PERMOX® - R / BRANDOL® 60 tube diffuser it has to checked if the piping is clean. Drilling chips, dirt etc. have to removed, otherwise during the start-up of the blowers the dirt will be transported into the diffusers, what may cause serious interferences / damages to the diffusers.
The surfaces of the rectangular pipes have to be clean and even.

Leveling:
The stiff – porous PERMOX® - R / BRANDOL® 60 tube diffuser is mounted on rectangular pipe. The piping has to be leveled on ± 3 mm.

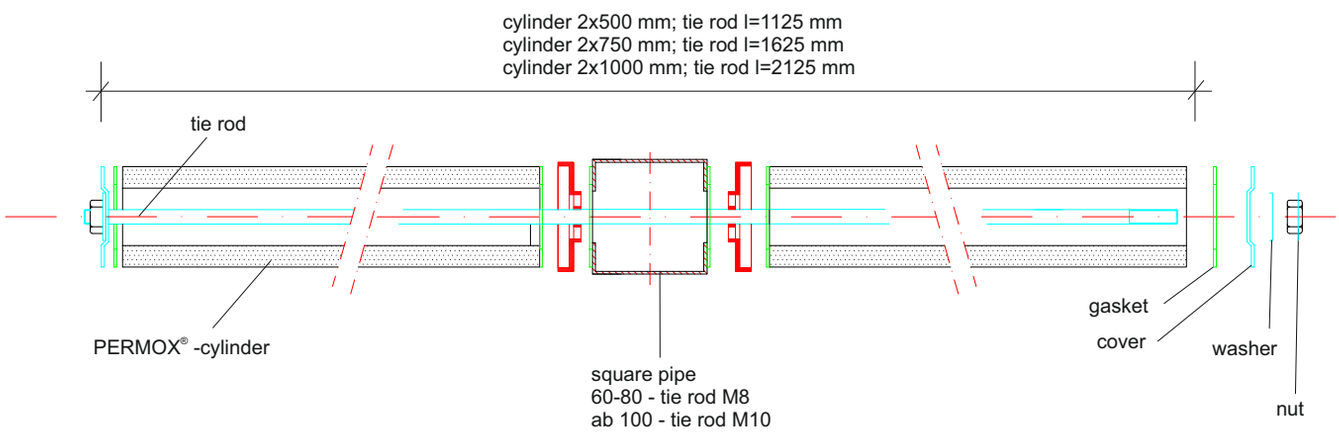
PERMOX® - R / BRANDOL® 60 will be installed with a stainless-steel tie rod at the side of a rectangular pipe (several dimensions possible).



Materials:

tie rod:	stainless steel (V4A/V2A)
centerpiece:	polypropylene (PP)
cover:	stainless steel (V4A/V2A)
gaskets:	EPDM
cylinder:	phenol resin tied quartzsand

Diffusersurface: 0,22 m²/m



von-Drais-Straße 7 • D-55469 Simmern / Hunsrück • Tel: +49 6761 / 9 65 09-00 • Fax: +49 6761 / 9 65 09-01 • info@oxyflex.de as of date April 2026

INSTALLATION

The stiff – porous PERMOX® - R / BRANDOL® 60 tube diffuser consists of two cylinders made of phenolic resin bonded, natural round shaped quartz sand. These both cylinders will be mounted side wards with a tie rod on a square pipe (min. 60 x 60 mm). The diffusers have to be mounted as shown.

The stiff – porous PERMOX® - R / BRANDOL® 60 tube diffuser will be closed with stainless-steel caps and EPDM flat gaskets at their ends.
A PP centering piece with two EPDM flat gaskets between square pipe and diffuser cylinder supports the correct positioning.

The stiff – porous PERMOX® - R / BRANDOL® 60 tube diffuser consist of 6 gaskets – 3 gaskets per cylinder:

- ➡ One gasket between square distribution pipe and centering piece,
- ➡ One gasket between centering piece and cylinder,
- ➡ One gasket between cylinder and end cap.

The proper fit of the undamaged gasket has to be checked during installation.

The cylinder is a self-supporting structure.

The tie rod has to be strained with a torque of 15 Nm (for M10) or 12 Nm (for M8). If the square distribution pipes have heights of below 100 mm and a wall thickness of below 3 mm, the tightening torque has to be reduced by 2 Nm.
During the installation of the PERMOX® - R / BRANDOL® 60 the correct fit and the intactness of the gaskets and centering pieces have to be ensured, as well as the tight and horizontal fit of the diffuser.

OPERATING MANUAL

Function- and leakage check:

Directly afterwards to the installation of the stiff – porous PERMOX® - R / BRANDOL® 60 tube diffusers a function- and leakage check has to be conducted.

Therefore the diffusers have to be fed with air (Feed: 8 mN^3 / h per meter length of diffuser) and the tank has to be filled up with clean water up to 10 cm above the top edge of the diffuser.

If the correct operation of all diffusers is ensured, the air feed will be reduced down to 3 mN^3 / h per meter length of the diffuser to improve the leakage check. Raising large bubbles point on possible leakages (e.g. slipped gaskets), which have to be eliminated.

The successful function and leakage check has to be documented. As well the water level should be raised up to 100 cm above top edge of the diffusers as soon as possible.

Function and leakage check:
After the function and leakage check the stiff – porous PERMOX® - R / BRANDOL® 60 tube diffusers have to be operated at minimum another 60 hours continuously at an air feed of min.
6 mN³ / h per meter lengths of the diffuser.

Bubble pattern
The bubble pattern should be assessed no sooner than when the above-described run-in of the diffusers has been completed. For this purpose the diffusers are operated from the maximum
(25 mN³ / h per meter lengths of the diffuser) down to the minimum specific load (2,3 mN³ / h per meter lengths of the diffuser).
The evenness of the aeration (bubble pattern test) should be checked when the tank is filled to a level of min. 60 - 100 cm of water above the diffuser top edge and an air feed of min. 6 mN³ / h per meter lengths of the diffuser.
Checking the evenness of the aeration at the minimum air feed 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 stiff – porous PERMOX® - R / BRANDOL® 60 tube diffusers, the above-mentioned steps must have been completed. Additionally the PERMOX® - R / BRANDOL® 60 tube diffusers have to be operated at least 1 week in clear water in advance.
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. A calibrated and exact measurement of the air volume is required.

Commissioning
If commissioning is delayed it must be ensured that the diffusers are sufficiently covered by water (at least 100 cm) so that the stiff – porous PERMOX® - R / BRANDOL® 60 tube diffusers are protected against frost and mechanical damage caused by falling objects, for example.
The PERMOX® - R / BRANDOL® 60 tube diffusers have to be operated permanently while the minimum air feed of 2,3 mN³ / h mustn't be underrun.

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MAINTENANCEINSTRUCTIONS

Stiff – porous PERMOX® - R / BRANDOL® 60 tube diffusers are low-maintenance.
Typically the operation at the maximum air feed once a day for 10 – 15 minutes is sufficient, whereas the maintenance feed has to be minimum 10 mN^3 / h per meter lengths of the diffuser.

Maintenance cylce:
Minimum once a year the stiff – porous PERMOX® - R / BRANDOL® 60 tube diffusers have to be undertaken a visual inspection. Especially sedimentations have to be observed. If there are any sedimentations, those have to be removed very carefully.

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 diffusers 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 20 hPa compared to commissioning), Supratec should be consulted immediately.

Acid dosing
If a pressure raise is observed, besides the maintenance air feed a frequent cleaning with diluted acid (75 % - 85 % formic acid) is possible. If it is necessary, diluted acid will be dosed into the pressured air. It will reduce the pressure loss and maximize the endurance of the diffusers. The air feed should be between 5 – 8 Nm^3 / h per meter lengths of the diffuser. Therefore, we offer a dosing station for the optimum dosed cleaning.
Additional information are available from SUPRATEC.

Run-up of the diffusers
If the minimum air feed was undercut and water or sludge got in the diffusers, those would have to run-up carefully up to an air feed of 10 – 12 mN^3 / h per meter lengths of the diffuser. Only after this the air feed may be reduced.

We reserve the right to make technical changes.
For current version please check our website www.oxyflex.de

GENERAL INFORMATION

Supratec Gesellschaft für Umwelt- und Verfahrenstechnik mbH has more than 50 years of experience with aeration technology and manufactures state-of-the-art, highly efficient aeration systems. These products are predominantly used for providing the oxygen supply for biological waste water treatment processes but can also be used for the aeration of liquids of all kinds.

Possible areas of application for Supratec diffusers are:

➡ communal waste water treatment plants

➡ industrial waste water treatment plants

➡ special technical processes such as the ”stripping” of gases, etc.

We have the competence and wealth of experience in order to consult and support you with the planning, implementation and operation of your projects.

We will also carry out gladly the installation of our products for you if required.

For further notes and special information please see the installation, operating and maintenance instructions.