

ROTAMAT® Membrane Screen RoMem



- Removal of fibrous material and hairs
- Increased operational stability of membrane bioreactors (hollow fiber and plate module systems)
- Significant COD/BOD reduction in river and sea outfalls



►► The Situation

For the new type of membrane bioreactors that have recently been put on the market the efficiency of conventional screens with typical bar spacings and perforations of 3-10 mm is no longer sufficient. Improved performance is required to ensure reliable and low-maintenance operation of these plants. Since especially fibrous material and hairs are a hindrance as they produce undesired tressings, fine apertures are applied to remove such material, preferably square mesh.

As river and sea outfalls frequently have only a mechanical screening stage, it is important to reduce the COD / BOD concentration of the wastewater discharged into the recipient to prevent eutrophication. It is therefore necessary to remove the particles as far as possible.

►► The solution

The ROTAMAT® Membrane Screen is a very fine screen with a low headloss and provides a large screening surface due to its drum-shaped screen basket and 35° installation angle. The screen uses a square mesh that provides, contrary to conventional slot screens, a defined separation size and ensures thus reliable separation of solids. The two-dimensional design and very fine apertures prevent that especially fibres and hairs are washed through the mesh before the screen basket surface is cleaned. Slot screens are not able to achieve the same efficiency due to their undefined separation size. In addition, square meshes have a very large free surface and are therefore able to cope with high hydraulic capacities despite their fine mesh.

The ROTAMAT® Membrane Screen is suitable for municipal and industrial wastewater flows of up to 3500 m³/h and can be equipped with a square mesh size from 0.5 to 1.0 mm. The low space requirement and high efficiency through a complete treatment by the combination of screening, transport, compaction, dewatering and discharge in one compact unit make the ROTAMAT® Membrane Screen an efficient and economical solution for removal of high solids concentrations. The screen can be installed either directly in the channel or in a separate tank.

►► The function

The wastewater flows through the open front into the screen basket and through the very fine apertures into the continuation channel. The solids

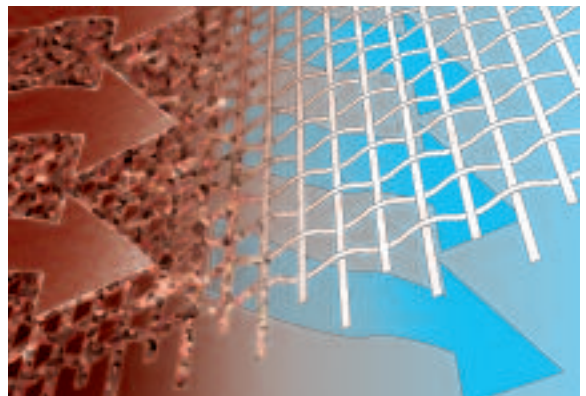


Particularly hairs and fibres are separated by means of the two-dimensional square mesh design.

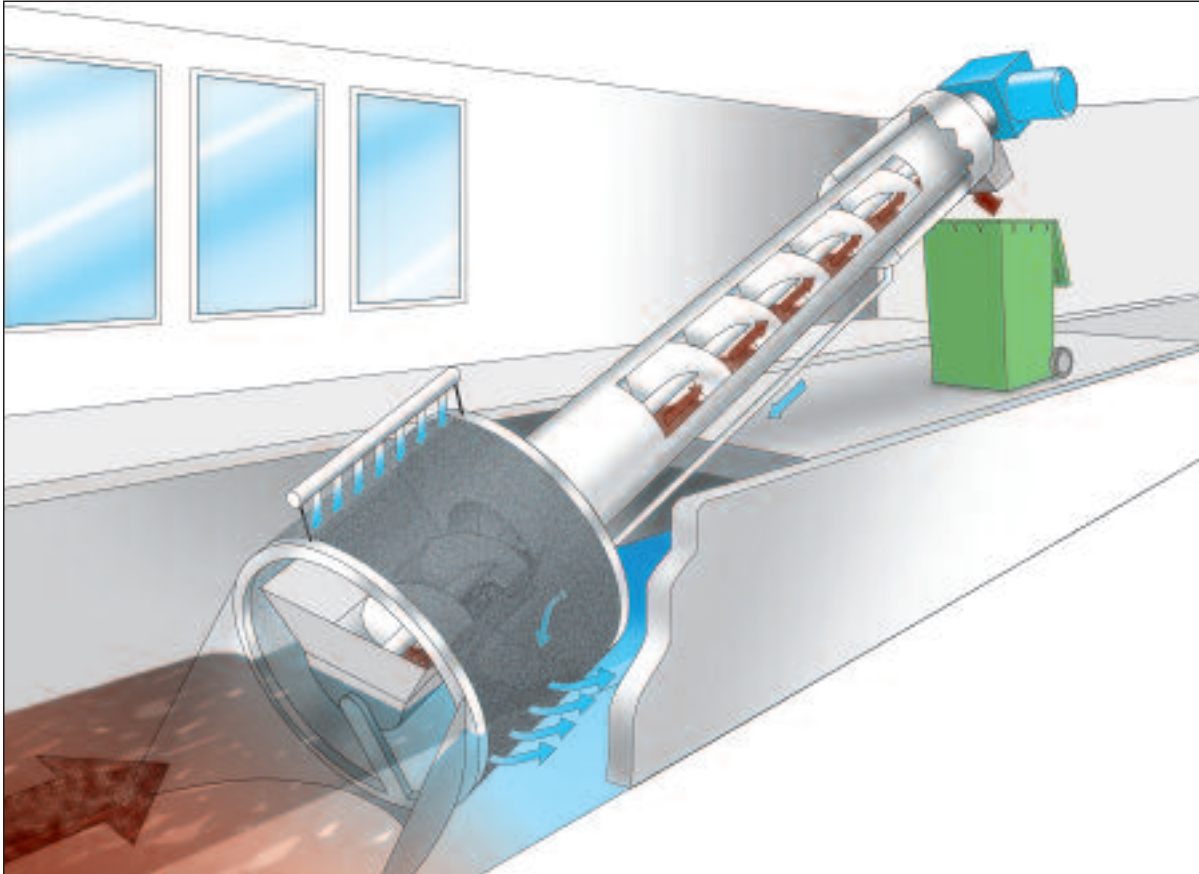
are retained on the screen basket surface leading to gradual blinding of the basket surface which has an impact on the level difference in the channel. The screen basket cleaning cycle starts at a defined level difference. The retained solids are washed off during rotation of the basket in the upper area, washed into the trough and removed from the channel area by the screw conveyor. The screened wastewater can be reused for this purpose if a very fine mesh size is used for screening. The screenings are at the same time dewatered in the closed unit and discharged in odourless condition.

Recovery of the organic carbon for denitrification is rendered possible by specific washing of screenings by means of an optionally available integrated screenings washing system. In river and sea outfall applications, however, this washing system is not applied to retain as much of the carbon as possible.

Periodic high-pressure washing at 120 bar (standard setting: twice a day) eliminates sedimentation on the screen basket.



Maximum separation efficiency due to the square mesh that provides a defined separation size



Flow diagram of the ROTAMAT® Membrane Screen

►► The applications

The ROTAMAT® Membrane Screen is used for screening of municipal and industrial wastewater, for separation of fibres and hairs.

The screen can be installed either directly in the channel or in a separate tank.

Separation of hairs and fibres prior to membrane bioreactors

The selection of the mesh size depends on the applied membrane system. Membrane modules are divided into hollow fibre and plate modules. Separation of fibrous material is particularly important prior to hollow fibre membrane plants as fibres may lead to tressing or blocking of the membrane with the result of a reduced membrane permeability and membrane plant performance. As a result, as fine as possible screening is required, in particular for hollow fibre membrane plants.

- 0.75 mesh size prior to hollow fibre membrane plants

Reduction of COD/BOD₅ in river and sea outfall applications

An as complete as possible reduction of the oxygen-consuming load that will be discharged into the receiving water course is particularly important in river and sea outfall applications as most of them do not have a mechanical treatment stage. An extensive reduction of COD/BOD in river and sea outfall applications can be achieved with 0.5 mm to 1.0 mm mesh size.

Treatment of industrial process wastewater

Due to new legislation concerning wastewater discharge into sewer systems, mechanical preliminary wastewater screening at source and treatment of the retained solids is required. The space-saving ROTAMAT® Membrane Screen is especially suitable for this purpose as it combines screenings separation, washing, transport and dewatering in one compact unit.

►► The user's benefits

- Screening with a defined separation size provided by the square mesh
- Removal of hairs, fibres and fine suspended material
- Increased operational stability of subsequent membrane bioreactors
- Fine screening of large wastewater volumes in a gravity line without the need for lifting the wastewater; low headloss
- Extensive reduction of COD/BOD in river and sea outfall applications
- High efficiency through combination of screening, (washing if required), compaction, transport, dewatering and discharge of screenings in one compact unit
- Ideal for installation in existing channels
- Periodic high-pressure washing at 120 bar (twice a day) eliminates sedimentation on the screen basket.
- An especially designed sealing between the channel and screen basket prevents unscreened wastewater from passing through the screen basket.



Screening of wastewater from a laundry



RoMem 780 installed in a standard container

►► Technical data

The machine is completely made of stainless steel and pickled in an acid bath which eliminates corrosion and thus reduces maintenance. The compact and special design allows for installation either in the channel or in a tank. The available screen basket can be covered with square mesh sizes from 0.5 to 1.0 mm. The ROTAMAT® Membrane Screen is also available as a frost-proof unit with an integrated heating cable and insulation for outdoor installation.



Outdoor installation of a Membrane Screen for removal of hairs and fibres prior to a hollow fibre membrane plant

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Subject to technical modification

ROTAMAT®
Membrane Screen
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