

ROTAMAT® liquid screens for maximum solids removal rates



- Protection of downstream MBR plants through removal of fibres and hairs
- Reduction of COD and BOD in river or sea outfall applications
- Reduced load on the biological treatment system of sewage treatment plants without preliminary treatment
- Removal of algae from surface waters

►► The Situation

MBR plants, especially those with hollow fibre membranes, are highly susceptible to hairs and fibres as these lead to tressing and clogging of the membranes. The efficiency of conventional screens with 3 to 10 mm bar spacing or perforation is insufficient for such membrane plants. Finer screens are indispensable to ensure the reliable operation of membrane plants without excessive maintenance requirements.

The task of primary settlement tanks is to mechanically remove very fine particles that settle on the bottom or float to the surface. The high solids removal rate in the primary settlement tank reduces the load on downstream biological treatment systems. However, the space requirements and investment costs for primary settlement tanks are high. Fine screening with up to 0.2 mm apertures can achieve the same removal rates on a much smaller footprint and with significantly lower investment costs.

►► The solution

The ROTAMAT® liquid screening systems are very fine screens that provide a large screening surface due to their drum-shaped screen basket and installation angle. The flow resistance and headloss of the screen are therefore low even with higher flow rates.

Mesh or perforated plate is used as screening surface material as due to the two-dimensional design of the mesh and perforated plate even very fine particles can be removed. Especially fibres and hairs are reliably retained. Even very fine slot screens are by far not able to achieve the same retention.

Two different types of screens are available:

ROTAMAT® Membrane Screen RoMem liquid:

The ROTAMAT® Membrane Screen RoMem liquid is equipped with a square mesh. Mesh sizes from 0.2 to 0.75 mm are available as required for the specific application.

ROTAMAT® RPPS Star liquid

The ROTAMAT® RPPS Star liquid is equipped with a perforated plate. Available perforations are 1 / 1.5 / 2 mm.

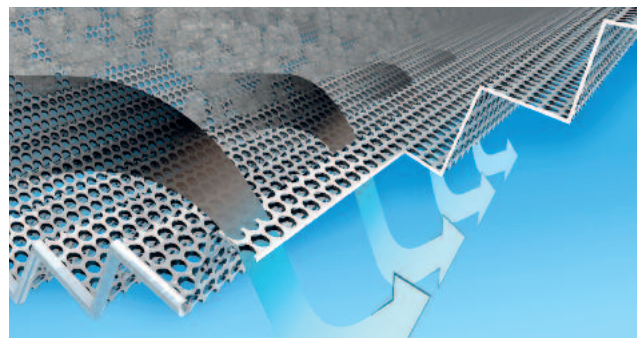
►► The function

The wastewater flows through the open front into the screen basket and through the very fine mesh apertures. Solids are retained on the mesh. A special sealing between the channel and the front-end screen basket opening prevents unscreened wastewater from passing through the screen basket.

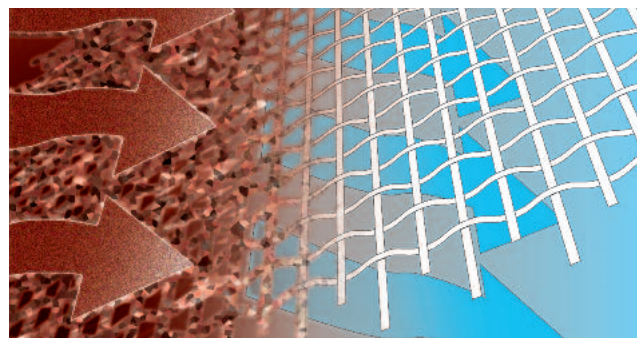
The solids retained on the screen basket surface lead to gradual blinding of the basket surface which has an impact on the level difference in the channel. The screen basket cleaning cycle starts at a defined water level in the channel upstream of the screen. The retained solids are washed off by a spray nozzle bar during the slow rotation of the basket around its inclined axis, washed into the trough in the centre of the screen basket, removed from the channel area by pump and delivered to the next treatment step.

The screenings can be introduced into the sludge treatment system as additional bulking material. If they are dewatered together with sewage sludge, increased solids contents can be achieved with reduced coagulant agent volumes. As an option, the mixture can be used as a co-substrate for sludge digestion to increase gas production.

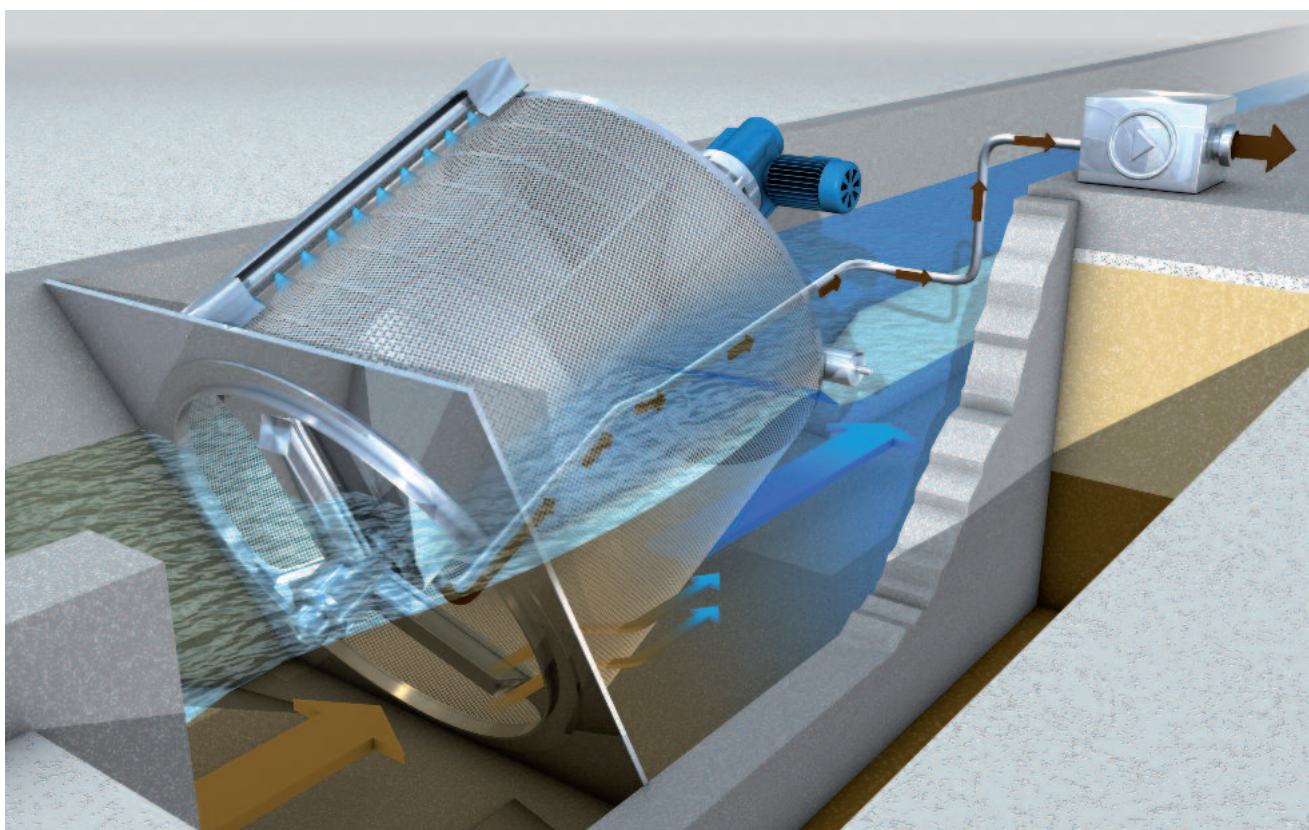
The screenings can however also be further dewatered in a HUBER Wash Press WAP liquid (see separate brochure for details) and discharged into a container to reduce the load on the sludge treatment system.



The zig-zag folded screen basket is used in ROTAMAT® RPPS Star liquid screens. As the folded perforated plate provides a 30% increase in screening surface, the machines can be manufactured as small compact units. They are available with 780 to 3,000 mm screen basket diameter and with perforations of 1.0, 1.5 and 2.0 mm.



Mesh sizes from 0.1 to 1.0 mm are used in ROTAMAT® Membrane Screen RoMem units. These fine mesh sizes provide a very fine separation size and thus maximum degree of separation. RoMem liquid units are therefore well suitable to replace primary settlement tanks.



Schematic diagram of a ROTAMAT® liquid screen

►► The applications

The ROTAMAT® Membrane Screen RoMem liquid / RPPS Star liquid is used for the separation of very fine suspended material within municipal and industrial applications. The ultra-fine screen can be installed either directly in the channel or supplied in a separate tank.

Removal of hair and fibres to protect downstream membrane filtration plants

The selection of the mesh size depends on the applied membrane system. Separation of all hairs and fibres is required prior to hollow fibre membrane systems as fibres may lead to tressing or blocking of the membrane. The screen types are normally used as follows:

- 0.5-1.0 mm square mesh to protect hollow fibre membranes
- 3.0 mm perforated plate prior to plate membrane systems (see separate brochure HUBER ROTAMAT® Perforated Plate Screen RPPS for details).

The fine screenings can be mixed with sewage sludge and treated together, or further dewatered in a wash press.

COD and BOD reduction prior to river or sea outfalls

Frequently, raw wastewater is only pre-treated with a mechanical coarse screen to remove at least unsightly waste prior to being discharged directly to a river or the sea. If the self-cleaning capacity of the receiving water body is insufficient for the discharged oxygen consuming substances, the discharged COD and BOD load must be reduced. Our ultra-fine screen with 0.1 to 0.3 mm mesh reduces COD and BOD by 20 to 40 %.

Reduced load on the biological treatment system of sewage treatment plants without preliminary treatment

The high COD and BOD removal rate reduces the load on downstream biological treatment systems. Separation of fine particles can be achieved in a primary settlement tank or with a very fine screen. Fine screening with up to 0.2 mm apertures can achieve the same removal rates on a much smaller footprint and with significantly lower investment costs than preliminary settlement tanks.

Removal of algae

Algae grow in eutrophicated water. If this water is used for water-saving drip irrigation, the algae may lead to clogging of hoses. The ROTAMAT® Membrane Screen RoMem liquid is an easy-to-install solution to remove algae.

►► The advantages

- Protection of downstream MBR plants through removal of fibres and hairs
- Removal rates as high as those of primary settlement tanks but on a much smaller footprint and with significantly lower investment costs
- Fine screening of large wastewater volumes in a gravity line with low headloss
- Extensive reduction of COD and BOD in river or sea outfall applications
- Fine screenings can be treated together with coarse screenings. High dewatering results are achieved through mixing with coarse bulking material.
- Optional treatment of fine screenings together with sewage sludge, reduction of specific polymer consumption for sludge dewatering through addition of coarse bulking material
- Suitable for installation into existing channels or for tank installation
- Maximum corrosion protection through stainless steel design and acid treatment in a pickling bath
- Sturdy design, low maintenance requirements

►► Technical data

The machine is completely made of stainless steel and pickled in an acid bath for optimal corrosion protection and minimised maintenance requirements. The compact unit can be supplied in a tank or installed directly in the channel.

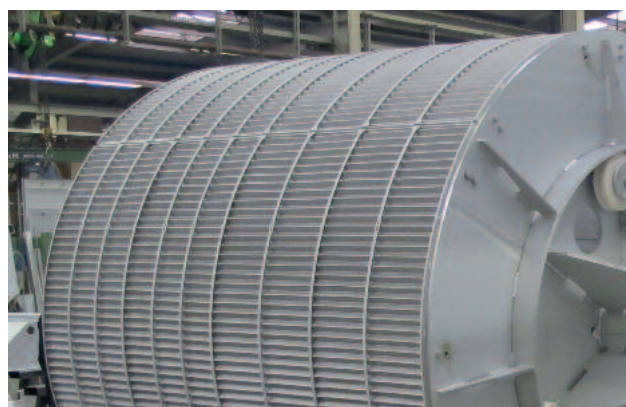
- Mesh sizes from 0.2 to 0.75 mm, perforations from 1.0 to 2.0 mm
- Screen basket diameters from 780 mm to 3000 mm
- For flows up to 5000 m³/h



The RPPS Star liquid design with folded screen basket surface provides up to 30% higher throughput capacities with perforations of 1 / 1.5 / 2 mm.



RPPS Star liquid unit, 2400 mm diameter, protecting downstream membrane systems, available sizes: up to 3000 mm diameter



Screen basket of a ROTAMAT® RPPS Star liquid screen with folded perforated plate

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