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[An Ounce of Protection is Worth a Pound of Cure - Protect Your MBR](#)

Membrane Bioreactors (MBRs) are wastewater treatment solutions designed to produce a very high quality effluent in order to meet stringent discharge standards. Meeting these standards is accomplished with the use of very thin material which acts as a filter for even the tiniest of particles within wastewater systems. But because the MBRs use such delicate filtering material, even moderately sized particles transferred into the system can mean serious damage to your MBR equipment.

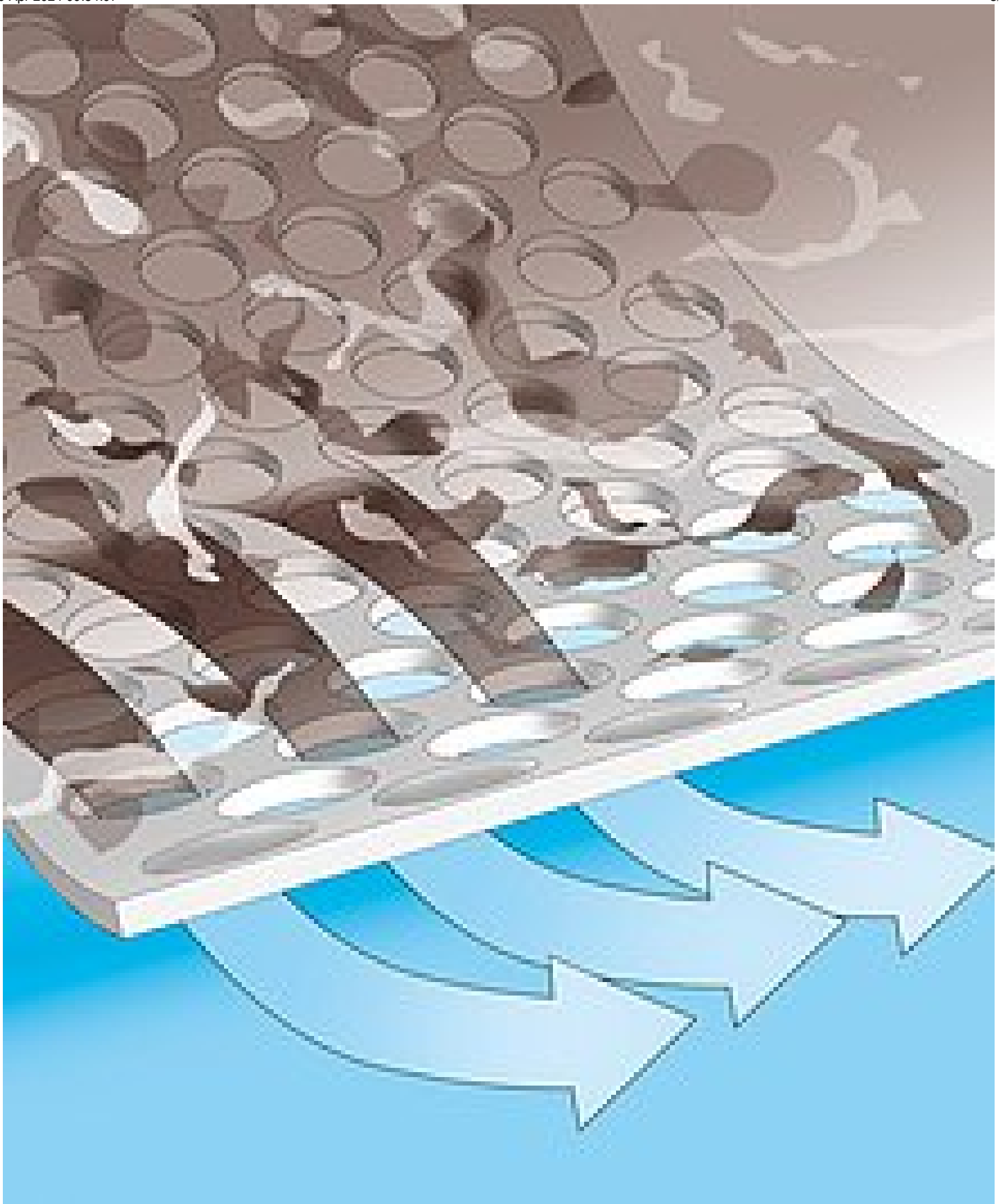


Perforated screen basket

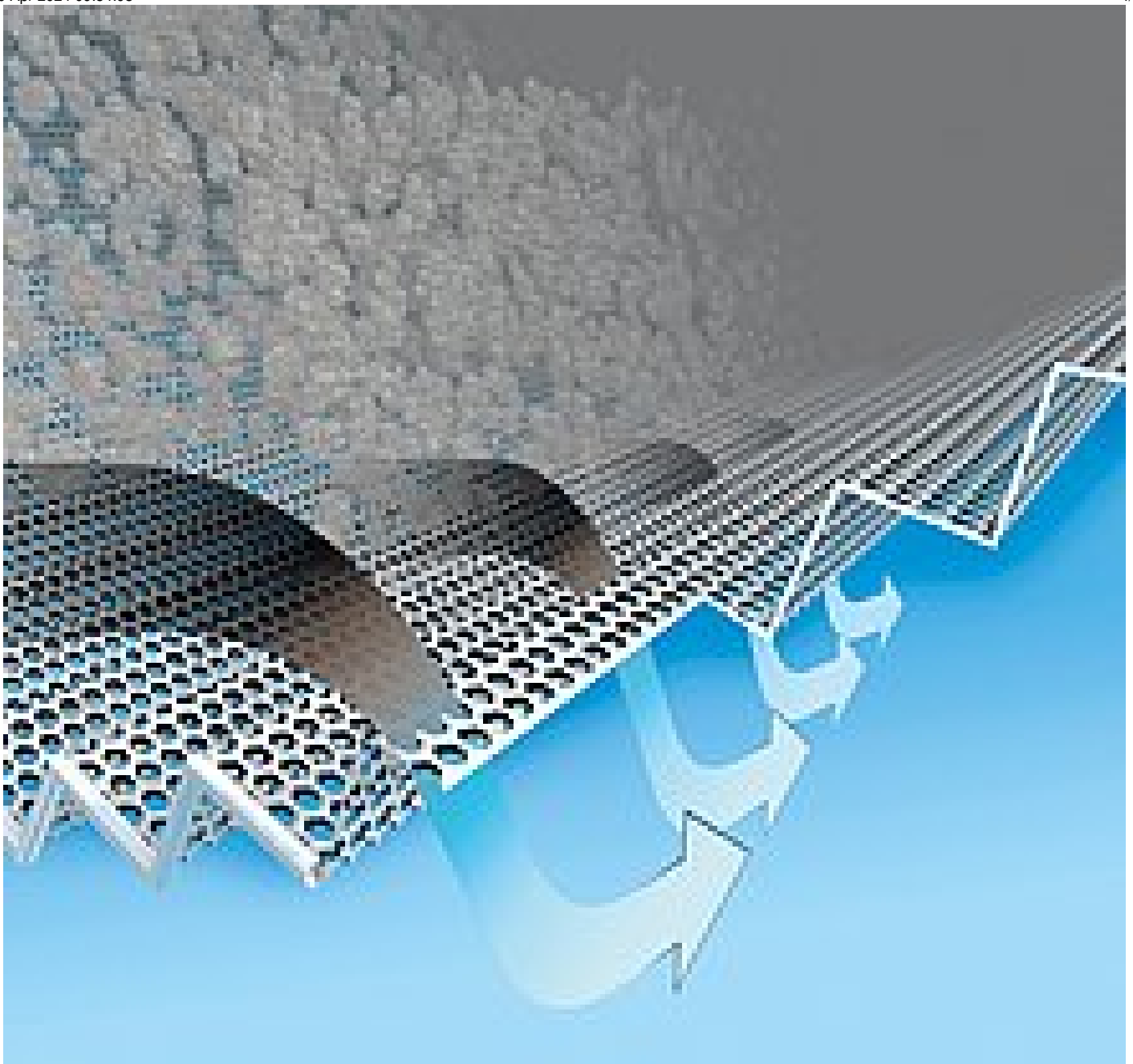




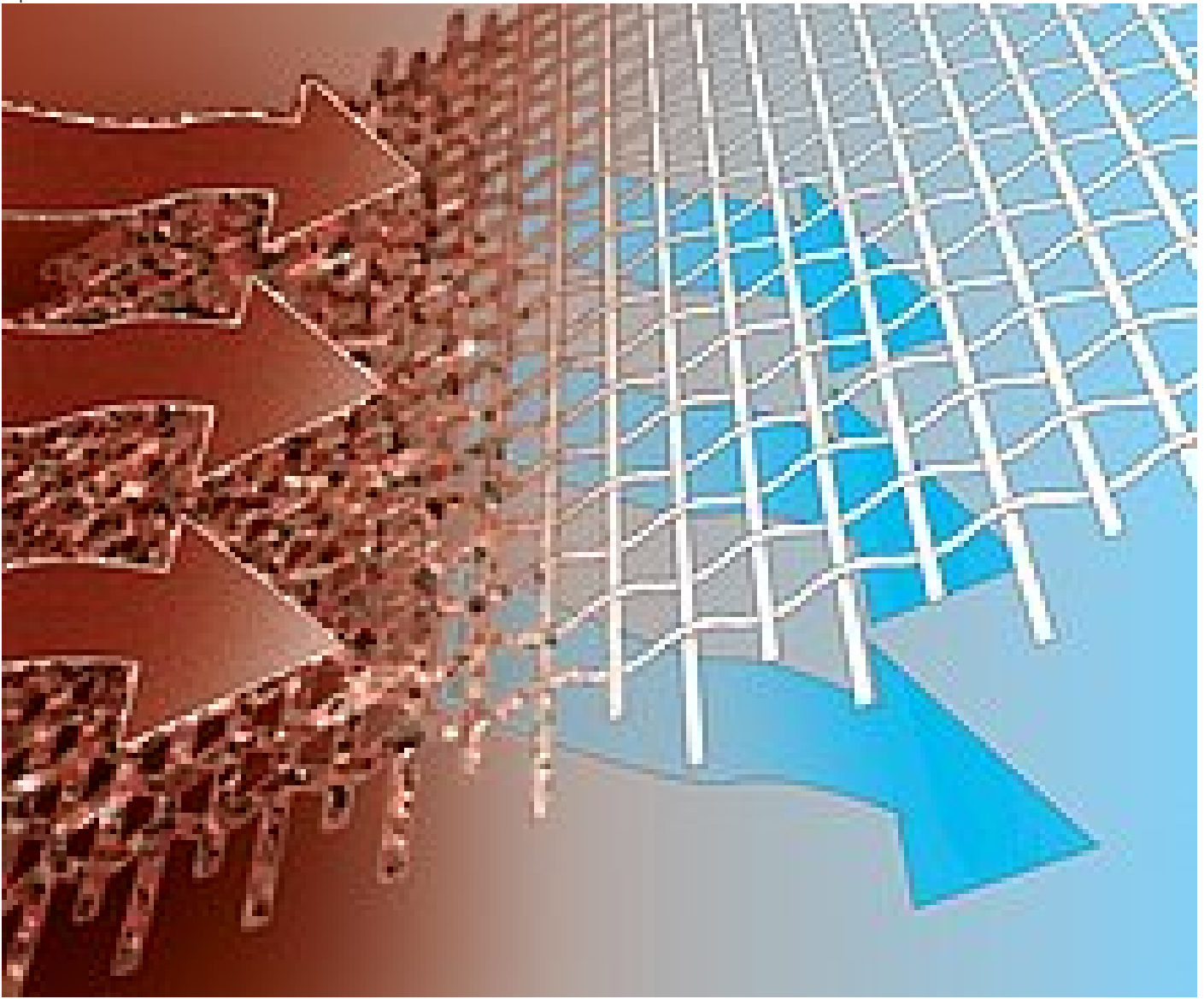
HUBER Perforated Plate Screens ROTAMAT® RPPS



Perforated plate screening principle



Folded perforated plate screening principle with a star-shaped zigzag folded surface



Square mesh screening principle

There are two types of considerations surrounding the selection of screening for MBR Plants: those pertaining to the screen itself and those pertaining to the environment the screen will be in. The factors pertaining to the screen itself are those which should be evaluated on any proposed equipment prior to selection. These include:

1. **Screen type** - Lesson learned from the first generation of MBR installations were that a 1-dimensional screen (slot openings) is not suitable. The opening size would need to be at least 5 times smaller to capture the same amount of solids compared to a 2-dimensional screen (hole or square mesh).
2. **Sealing** - Another important feature to consider on a screen is the sealing. The type seal between individual screen elements, and if no seals are used, the gap size between the plates, should be carefully considered. Check for seals between rotating screen parts and a stationary frame, as well as between the screen and the channel walls and channel floor. Leaking seals or gaps between screening elements due to inefficient design, poor manufacturing quality, or high wear are the number one reason for screenings bypass and the resulting performance and maintenance issues with the membranes themselves.

The other factors to consider when selecting and sizing [the best fine screen](#) to protect an MBR plant generally pertain to the wider plant environment, and requires considerably more information than just selecting and sizing a conventional headworks screen. Several factors which precede the screen will also affect the selection and sizing of the screen. Here are 9 considerations for selecting and sizing MBR screening:

1. **Sewer system** - Details of the sewer system are very important for the sizing of the fine screen. Combined sewer systems, in particular if the sewer network is long, by gravity, and shallow can lead to sudden solids peaks. These sudden peaks can lead to increased blinding of the fine screen.
2. **Avg. vs. peak flow** - Traditionally screens have been designed mainly for peak flow conditions. For fine screens for MBR plants it is also important to know how long the screen will see the peak flow. This can greatly affect the runtime and thereby the wear and wash water consumption of the screen.
3. **Plant hydraulics** - Fine screens for MBR plants (< 3mm openings) are much more sensitive to flow and solids loading and variations and can blind very fast. Therefore MBR screens need to be designed with a much higher safety factor, which translates to more separation surface area and thereby larger screens, to handle comparable flows.

4. **Existing or planned coarse screens** - Installing [coarse screens](#) (or even additional fine screens when very fine openings are used for MBR protection) in front of the MBR screen is very important in particular for CSO applications, larger plants with high TSS load applications, and when fine screens with 2mm and smaller openings are used for MBR protection.
5. **Grit traps** - Grit traps should be installed in front of the fine screens utilizing a two stage screening approach.
6. **Fats, oils, and grease** - A grease management strategy or [grease removal](#) upstream of the fine screen needs to be implemented to avoid blinding of the screen surface with grease. If grease is a known issue, wash water pressure to the screen should be increased to 100-140 psi and if possible a separate hot water wash connection should be added.
7. **Other existing pretreatment processes such as grinders** - Grinders or comminutors are not recommended in front of MBR plants. Fine particles created by these devices can pass the fine screen. They also create sharp debris which can damage the membrane plates or hollow fibers. Also, string/rag reformation has been observed downstream of some grinder applications.
8. **Primary clarifiers** - Primary clarifiers can decrease the solids loading to the fine screens considerably and in particular even-out solids peaks. However they also change the nature of the screenings removed by the fine screens. Screenings will be mostly fine grit or fine silty material along with very [fine fibers and some floatables](#) . This material behaves more like sludge than normal screenings. Conveying the material with an inclined auger and using the traditional screenings wash and compaction prove to be challenging. It is therefore recommended to use a rotary drum screen version which either pumps the screenings-sludge mixture out of the screen or alternately uses a sluice to transport the screenings out of the drum screen.

The pretreatment system, in particular the fine screens, play an important role in protecting membranes, ensuring stable operation of the MBR stage, and reducing physical maintenance as well as chemical cleaning needs of the membrane units. Besides the opening size of the screen, the screen cleaning system and seals are important features to consider during MBR screen selection. Proper sizing and design of the fine screens are key to a successful MBR screen application as fine screens are very sensitive to flow and solids variations and can be overloaded very easily.

Related Products:

- [HUBER Rotary Drum Fine Screen / Perforated Plate Screen - ROTAMAT® Ro2 / RPPS / STAR](#)
- [HUBER Drum Screen LIQUID](#)

Related Solutions:

- [HUBER Solutions for Mechanical Pre-Treatment](#)

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