



SUPRATEC

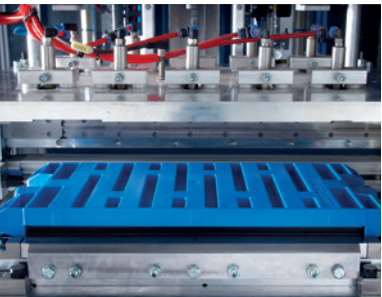
MicroClear® membranes. *Modular simplicity.*

Submerged Membrane Technology for MBR

Who we are



Based in Simmern/Hunsrück (Germany), Supratec Membrane GmbH is the membrane division of the Supratec Group, who has more than 40 years of experience in the wastewater treatment field and is located in Simmern/Hunsrück, Germany. Supratec Group is well-known all over the world for its high efficiency fine bubble diffusers, but now Supratec is more and more respected as highest German quality membrane supplier with more than 30 years membrane team experience. Supratec membranes are manufactured with fully automatic production lines made in Germany which is one of the most modern membrane-manufacturing plants of the world, while Supratec MBR cassettes are assembled in Shanghai plant, China. Many famous MBR cassette manufacturers in the world are our OEM customers, using Supratec membrane due to our highest quality



What we do

Supratec's patented MicroClear® filter consists of a series of durable, specially designed polypropylene

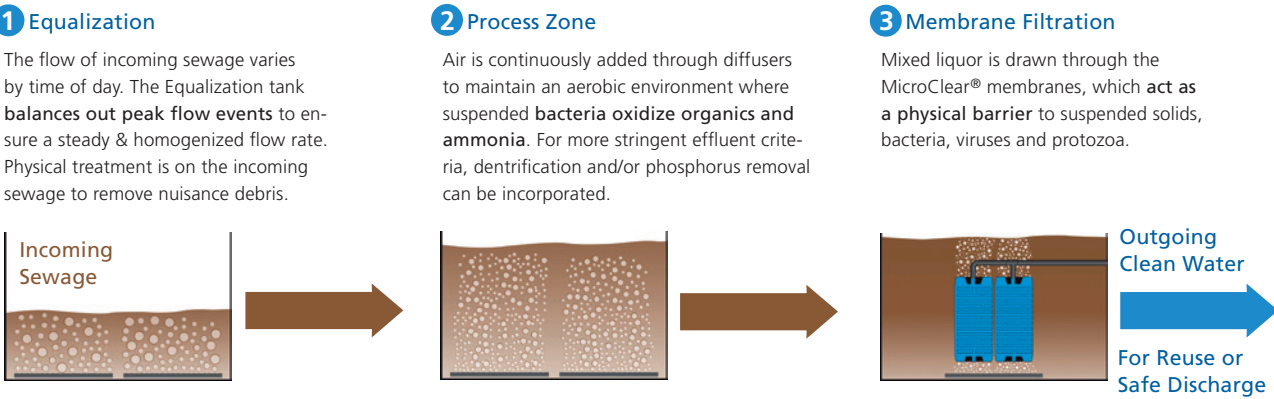
plates sandwiched by ultrafiltration (UF) membranes. The filters are submerged in mixed liquor in a separate membrane tank, while clean permeate is drawn through the membranes using a slight negative pressure. The 0.04 µm pores of the membranes physically block particles, bacteria and viruses. Supratec's MicroClear® membranes provide extremely high-quality filtrate that meets or exceed most regulatory requirements.

Supratec's immersed flat sheet ultrafiltration type membrane filtration system draws water through the membranes by means of a low-pressure vacuum. Treated water drawn through the membranes is pumped out (or gravity fed) to the treated water discharge point.



MCXL2 Filter

MBR Technology

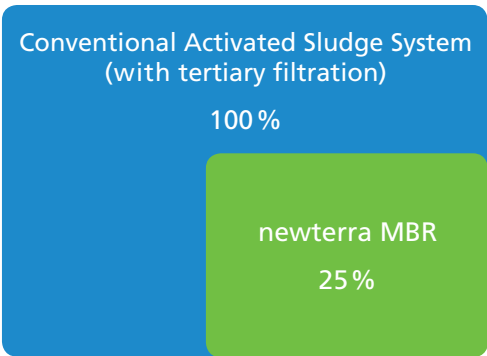


MBR Benefits

Water Reuse Quality

| Typical Filtrate Quality | |
|--------------------------|-------------|
| BOD ₅ | < 2.0 mg/L |
| TSS | < 1.0 mg/L |
| Ammonia Nitrogen | < 1.0 mg/L |
| Total Phosphorus | < 0.1 mg/L |
| Total Nitrogen | < 5.0 mg/L |
| Turbidity | < 0.5 NTU |
| Bacteria Removal | 6 ... 7 log |

Smaller Footprint



MicroClear® References



Domestic wastewater



Maritime



Remote work camps



Textile industry

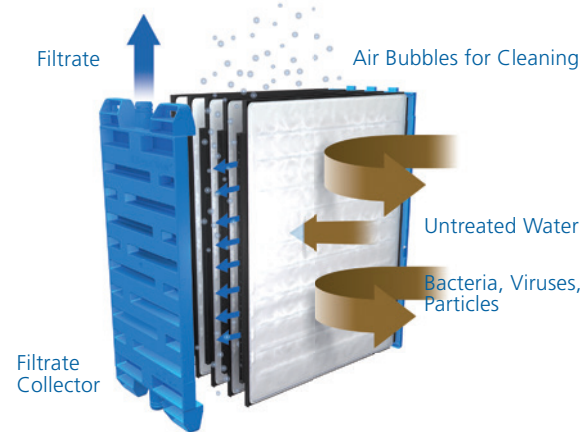


Automotive industry



Food & beverage industry

How it works: Filtration with submerged membranes

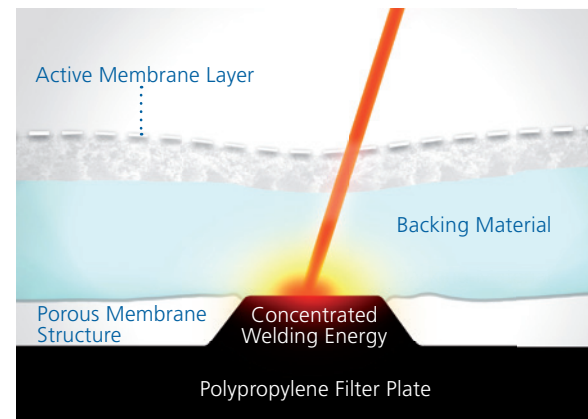
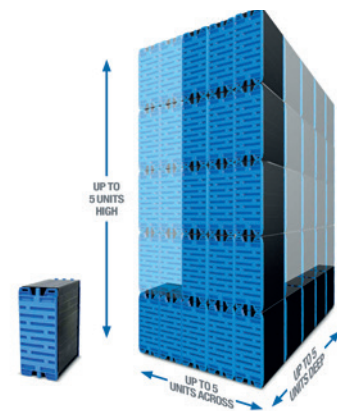


Submerged Membrane Technology for MBR with Crystal Clear Benefits

- Robust polypropylene plates with welded membranes on both sides
- Maximum retention of bacteria and viruses
- The useful life of the filters is up to ten years
- Designed without the need for adhesives or seals

Replacement Product for Hollow Fiber and Flatsheet Membrane Installations

- Highest package density for flatsheet membranes with 185 m²/m³
- Less maintenance effort
- Smaller total costs of ownership
- Less energy consumption than other products
- More than 32 different module sizes available

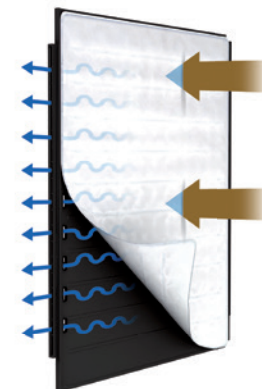


Innovative Thermal Welding Process

- The membrane/filter plate unit delivers the highest structural integrity and long-term durability
- State-of-the-art thermal welding process
- Unlike conventional welding processes, ours does not damage the membrane layer

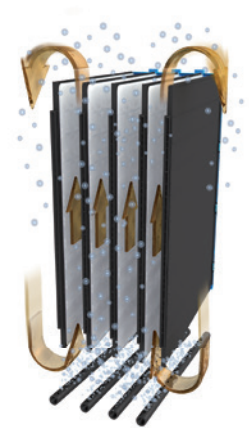
Uniform Pressure Distribution

- Patented design with multiple filtrate outlets
- Uniform pressure distribution over the entire surface of the membrane
- Formation of partial surface layers is prevented



New, Optimized Aeration

- High cross-flow velocities are achieved
- Reduced air requirement
- Optimized bubble size enhances cleaning performance
- Improved diffuser design

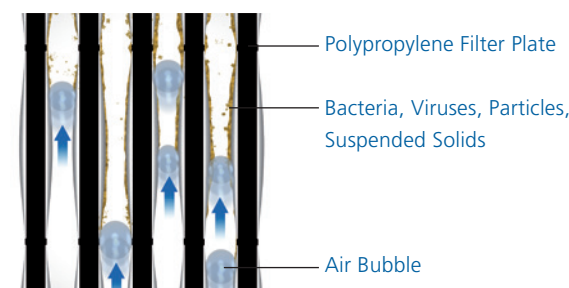
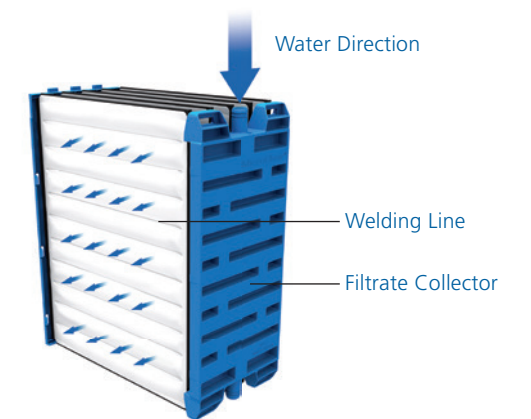


Removable Backplate

- Backplate for plate stabilizing
- Easy to disassemble and put back together
- Smart cleaning of each single flat sheet

True Back Flush Capability

- Consistent, precisely defined spacing of the individual plates
- Extremely uniform distribution of flow and cleaning process
- MicroClear® filters can be completely back flushed



Effective air scouring due to optimized bubble sizes for the plate distance

Cleaning without Chemicals

- Carefully defined bubble size cleans the membrane surfaces
- Simultaneous addition of oxygen into the activated sludge is ensured
- The need for chemical cleaning is kept to an absolute minimum
- Hydrophilic membrane material

Modular Simplicity:

The flexible modular approach of our MicroClear® MBR System

The Basic Building Block

Our water treatment systems are based on our MBR MCXL2 filter, which has a membrane surface area of 8 m². Its innovative design allows it to be configured in groups of 10 to 125 filters to fit into any tank. This flexibility allows us to effectively tailor to the customer requirements. We have more than 32 different module sizes available.

Made in Germany for Exceptional Quality

We are proud to say that MicroClear® filters and modules are designed and built in Germany at our ISO 9001:2015 certified facility.

With several design patents and our use of state-of-the-art manufacturing, MicroClear® sets the standard for leading edge membrane technology.

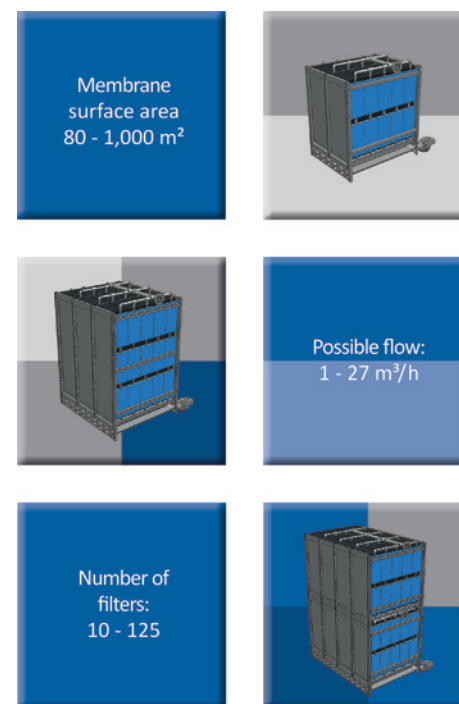
Environmentally-Friendly and Sustainable

The high packing density of our MicroClear® filters (185 m²/m³) minimizes the space requirements of our modules. With very low aeration demand, back flush capability and minimal maintenance requirements, it is no surprise why MicroClear® is used in more than 1,000 installations worldwide.

Solid Support from Beginning to End

Supratec GmbH offers technical and piloting support from the design phase right through to execution.

The flexibility of our MicroClear® technology means we can replace any brand of existing modules easily and cost-effectively.



MicroClear® Modules

| | Module | Dimensions L x W x H [cm] | Membrane surface area [m²] | Number of filters | Possible flow [m³/d] ¹⁾ | Required airflow for scouring [Nm³/h] | Air connection DN [mm] | Filtrate connection DN [mm] | Approx. weight [kg] |
|------------------|-----------|---------------------------------|----------------------------------|-------------------------|--|--|---------------------------------|--------------------------------------|---------------------------|
| COMPACT | MA03-S | 28 x 32 x 68 | 3.5 | 1 | 1-3 | 6 | 19 DA | 25 DA | 17 |
| | MA03-M | 28 x 32 x 117 | 7 | 2 | 2-5 | 6 | 19 DA | 25 DA | 30 |
| | MA03-XL | 43 x 35 x 65 | 8 | 1 | 2-5 | 10 | 19 DA | 25 DA | 23 |
| | MA03-XL2 | 43 x 35 x 113 | 16 | 2 | 5-10 | 10 | 19 DA | 25 DA | 35 |
| | MB2-S | 60 x 50 x 136 | 32 | 4 | 10-20 | 20 | 32 | 40 | 90 |
| FLEXIBLE | MB2-M | 81 x 50 x 136 | 48 | 6 | 17-35 | 30 | 32 | 40 | 130 |
| | MB2-1 | 130 x 70 x 135 | 80 | 10 | 25-50 | 50 | 80 | 40 | 190 |
| | MB2-2 | 130 x 112 x 135 | 160 | 20 | 50-100 | 100 | 80 | 40 | 380 |
| | MB2-3 | 130 x 154 x 135 | 240 | 30 | 75-150 | 150 | 80 | 40 | 570 |
| | MB2-4 | 130 x 196 x 135 | 320 | 40 | 100-200 | 200 | 80 | 40 | 760 |
| | MB2-5 | 130 x 238 x 135 | 400 | 50 | 125-250 | 250 | 80 | 40 | 950 |
| | MB3-1 | 130 x 70 x 185 | 120 | 15 | 37-75 | 50 | 80 | 40 | 260 |
| | MB3-2 | 130 x 112 x 185 | 240 | 30 | 75-150 | 100 | 80 | 40 | 520 |
| | MB3-3 | 130 x 154 x 185 | 360 | 45 | 112-225 | 150 | 80 | 40 | 780 |
| | MB3-4 | 130 x 196 x 185 | 480 | 60 | 150-300 | 200 | 80 | 40 | 1,040 |
| | MB3-5 | 130 x 238 x 185 | 600 | 75 | 187-375 | 250 | 80 | 40 | 1,300 |
| | MB4-1 | 130 x 70 x 245 | 160 | 20 | 50-100 | 50 | 80 | 40 | 360 |
| | MB4-2 | 130 x 112 x 245 | 320 | 40 | 100-200 | 100 | 80 | 40 | 720 |
| | MB4-3 | 130 x 154 x 245 | 480 | 60 | 150-300 | 150 | 80 | 40 | 1,080 |
| | MB4-4 | 130 x 196 x 245 | 640 | 80 | 200-400 | 200 | 80 | 40 | 1,440 |
| HIGH PERFORMANCE | MB4-5 | 130 x 238 x 245 | 800 | 100 | 250-500 | 250 | 80 | 40 | 1,800 |
| | MB5-1 | 130 x 70 x 295 | 200 | 25 | 62-125 | 50 | 80 | 40 | 430 |
| | MB5-2 | 130 x 112 x 295 | 400 | 50 | 125-250 | 100 | 80 | 40 | 860 |
| | MB5-3 | 130 x 154 x 295 | 600 | 75 | 187-375 | 150 | 80 | 40 | 1,290 |
| | MB5-4 | 130 x 196 x 295 | 800 | 100 | 250-500 | 200 | 80 | 40 | 1,720 |
| | MB5-5 | 130 x 238 x 295 | 1,000 | 125 | 315-630 | 250 | 80 | 40 | 2,150 |
| | MX384 | 194 x 74 x 221 | 384 | 48 | 140-280 | 180 | 80 | 40 | 870 |
| | MX432 | 220 x 98 x 172 | 432 | 54 | 155-310 | 180 | 80 | 40 | 940 |
| | MX640 | 243 x 96 x 264 | 640 | 80 | 230-460 | 200 | 80 | 40 | 1,350 |
| | MX640-512 | 243 x 96 x 264 | 512 | 64 | 184-368 | 160 | 80 | 40 | 1,200 |
| | MX800 | 243 x 96 x 313 | 800 | 100 | 288-575 | 200 | 80 | 40 | 1,650 |
| | MX800-640 | 243 x 96 x 313 | 640 | 80 | 230-460 | 160 | 80 | 40 | 1,400 |

¹⁾ The range for the possible flow depends on the achievable flux rate, application, influent water quality, temperature and/or process conditions. Above table list modules' flows at fluxes of 15-30 l/(m²h).



The MicroClear® System

The basic building block of the MicroClear® system is the MCXL2 filter, capable of extremely flexible deployment. With their unique capabilities, MicroClear® filters never fail to impress, no matter whether the project is a small waste-water treatment system for between 4 and 50 people, or a central sewage plant constructed of modular units serving up to 100,000 residents.

- Sustained flux up to 30 l/m²h
- Full back flushing capability allows quick and easy cleaning
- Patented thermal welding process ensures highest level of structural integrity and durability
- Patented filtrate plate ensures a uniform distribution of pressure
- Modular, stackable and thus minimal space requirement, high packing density of 185 m²/m³
- Low energy costs
- Easy maintenance

COMPACT (3.5 - 48 m²)



MB2-M Module

FLEXIBLE (80 - 1,000 m²)



MB5-5 Module

HIGH PERFORMANCE (384 - 1,600 m²)



MX800 Module

SUPRATEC

MicroClear®membranes. *Modular simplicity.*

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