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DISINFECTANTS FOR LIFE 



Sanosil MC product line for **MF-UF-NF-RO filters**

Cleaning and disinfection of membrane filter systems

www.sanosil.com

Sanosil MC-products



Special products for reverse osmosis, microfiltration and ultrafiltration systems



... for perfect cleaning and disinfection

- ✓ Removes poorly soluble mineral deposits from filter materials
- ✓ Removes metal hydroxides (rust, etc.)
- ✓ Dissolves limescale crusts, organic contamination and oil residues
- ✓ Eliminates biofilms and germs
- ✓ Optimises flow rate, reduces filter pressure and energy consumption
- ✓ Compatible with standard filter materials, such as DOW Chemical/Filmtec™ *
- ✓ Easy to rinse – also suitable for drinking water systems
- ✓ Can also be used to treat fabric filters and ceramic filter cartridges
- ✓ High-quality product made in Switzerland

* with correct dosage / application



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Filter membrane cleaning and disinfection

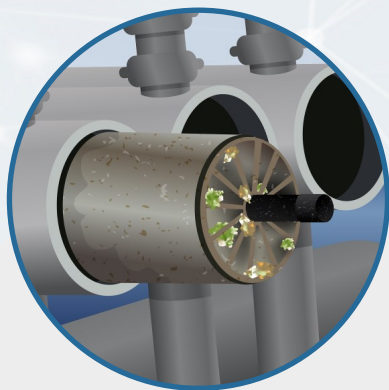
Membrane filter: possible types of contamination

Membrane filter systems are designed to treat water to achieve the highest possible degree of purity. However, this also means that any retained substances can accumulate on the membrane surfaces over time, despite continuous rinsing during operation.

This process is known as "fouling". A distinction is made between 3 types of deposits: **organic contamination, mineral deposits and biofilms (contamination)**. Unless steps are taken to combat fouling, the membrane's performance will steadily decrease over time. This means that the back pressure increases, the energy costs climb, the permeate quality decreases and the filter cartridge or membrane ages prematurely and must be replaced.

In the case of contamination / biofilm growth, there is also an increased risk that bacteria could reach the permeate side through tiny cracks or design-related leaks in the cartridge and contaminate the pure water. This may occur despite the fact that, according to the specifications, the membrane retains microorganisms.

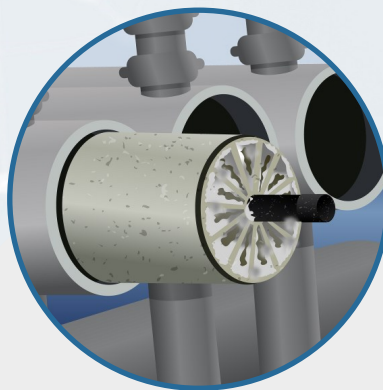
It is therefore essential to clean and disinfect the system at regular intervals for cost-efficiency reasons and to ensure product safety.



Organic fouling

Organic fouling: deposits caused by humic substances, protein deposits and fats/oils.

Can be removed with alkaline detergent - Sanosil MC-A



Mineral deposits

Colloidal fouling: deposits caused by salts / minerals, such as limescale, magnesium, gypsum, sludge and dissolved metals (iron and manganese, etc.)

Can be removed with acid detergent - Sanosil MC-S



Biofilms and germs

Biofouling: fouling of the membrane surface with biofilms - slimy coatings of microorganisms.

Can be removed by disinfectants containing hydrogen peroxide - Sanosil S015 or Super 25



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Products for cleaning



Sanosil MC-A



Alkaline filter membrane cleaner, pH 14

Product type: concentrate (dangerous goods, UN No. 3266)

Contains: potassium hydroxide, sodium hydroxide, phosphonates, amphoteric surfactants

Effective against: organic soiling, humic / fulvic acid, grease/oil, protein deposits

Preferred application: circulation / continuous process, immersion treatment

Container size: 10l, 20l

Dosage: 0.5-2%

Exposure time: 10-30 min at 25-50°C,
(PA membranes (e.g. Dow Chemical Filmtec TM): pH 13 for 30 min at 25°C)

Sanosil MC-S



Acidic filter membrane cleaner, pH 1-2

Product type: concentrate (dangerous goods, UN No. 3265)

Contains: methyl sulfonic acid, anionic and nonionic surfactants

Effective against: limescale, poorly soluble mineral deposits, metal oxides

Preferred application: circulation / continuous process, immersion treatment

Container sizes: 10l, 20l

Dosage: 0.5-2%

Exposure time: 1-3 hours at 30-50°C
(PA membranes (e.g. Dow Chemical Filmtec TM): pH 1-2 for 30-120min at 30-35°C)

Sanosil TPC-S



Acid cleaner and descaler with corrosion inhibitor, pH 1 For cleaning tanks, pipes and filter housings, etc. (without membrane filters)

Product type: concentrate (dangerous goods, UN No. 3265)

Contains: hydrocarboxylic acid, 2-hydroxyethanoic acid, methylsulfonic acid, ethylhexyl hydrogen sulfate

Effective against: limescale, poorly soluble mineral deposits, metal oxides, light oil residues, biofilms / bacterial slime (pre-treatment for Sanosil disinfectant)

Preferred application: spray-on, continuous process, immersion treatment

Container size: 10l

Dosage: 10-100%

Exposure time: 15 min - 12 hours (overnight)



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Products for disinfection



Sanosil S015



Water and water system disinfectants

Product type: concentrate (no dangerous goods)

Contains: 7.5% hydrogen peroxide, boosted with 0.0075% silver

Effective against: water germs, biofilm / bacterial slime (biofouling)

Preferred application: circulation / continuous process, immersion treatment

Container sizes: 10kg, 25kg

Dosage: (Shock) 0.66-3.3%

Exposure time: 1-4 hours

(for PA membranes e.g. Dow Chemical Filmtec TM: **max. water temperature <25°C**)

Sanosil Super 25



Water and water system disinfectant (high concentrate)

Product type: concentrate, dangerous goods, UN 2014

Contains: 50% hydrogen peroxide, boosted with 0.05% silver

Effective against: water germs, biofilm / bacterial slime (biofouling)

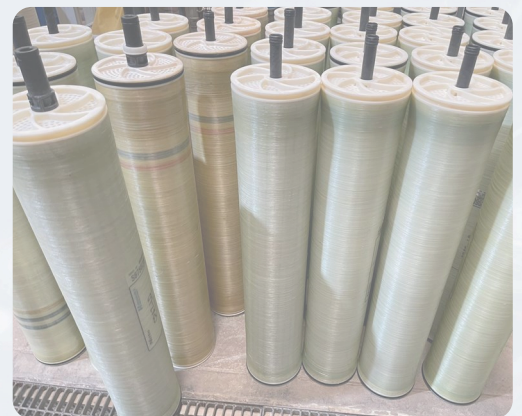
Preferred application: circulation / continuous process, immersion treatment

Container sizes: 30 kg

Dosage: (Shock) 0.1 - 0.5% (1000 - 5000 ppm)

Exposure time: 1-4 hours

(for PA membranes e.g. Dow Chemical Filmtec TM: **max. water temperature <25°C**)



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Practical application



Time of cleaning:

The time for cleaning and disinfecting filters is, at the latest, when one or more of the following symptoms occur.

- The usual permeate flow rate drops by 10%.
- The usual salt flow increases by 5-10%.
- The pressure difference (feed pressure minus concentrate pressure) increases by 10-15%.

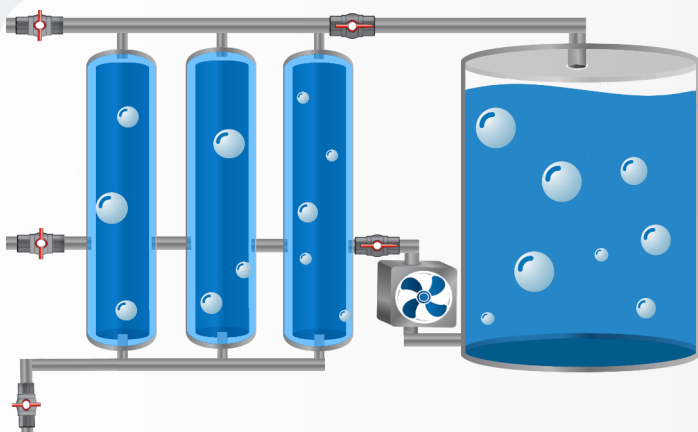
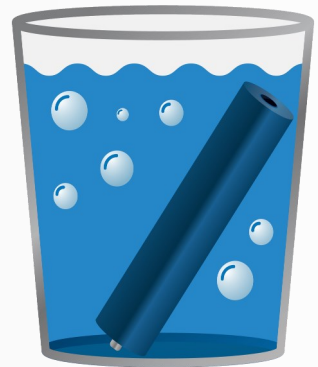
If cleaning is delayed for too long, the cleaning may not successfully restore the performance of the membrane element.

Cleaning method 1: Immersion method

The filters are removed from the housings and immersed in a bath of cleaning solution. This method is suitable for smaller filtration systems without the option for a cleaning circuit.

We recommend the following procedure for **Filmtec membrane filters made of PA / polyamide**:

1. Immersion in a bath of alkaline cleaning solution with Sanosil **MC-A: 0.5-2% for approx. 30 minutes**. The pH value of the solution at 25°C should not exceed 12. Then rinse thoroughly.
2. Immersion in a bath of acidic cleaning solution Sanosil **MC-S: 0.5-2% for 60-120 minutes**. The pH value should not fall below 1 at max. 35°C. Then rinse thoroughly.
3. Disinfection in a bath with **0.1-0.5% Sanosil Super 25** or **0.7-3% Sanosil S015**, ideally mixed with permeate water. Duration 1-4 hours. Important: **the temperature must not exceed 25°C** to prevent damage to the membranes.



Cleaning method 2: Circulation method

The filters are sporadically loaded with cleaning solution via a special cleaning circuit. The cleaning solutions can be stacked and used multiple times. We recommend cleaning any pre-filters separately beforehand.

We recommend the following procedure for **Filmtec membrane filters made of PA / polyamide**:

1. Rinse with alkaline cleaning solution containing Sanosil **MC- A: 0.5-2% for approx. 30 minutes**. The pH value of the solution at 25°C should not exceed 12. Then rinse thoroughly.
2. Rinse with acidic cleaning solution Sanosil **MC-S: 0.5-2% for 60-120 minutes**. The pH value should not fall below 1 at max 35°C. Then rinse thoroughly.
3. Disinfection in a bath with **0.1-0.5% Sanosil Super 25** or **0.7-3% Sanosil S015**, ideally mixed with permeate water. Duration 1-4 hours. Important: **the temperature must not exceed 25°C** to prevent damage to the membranes.



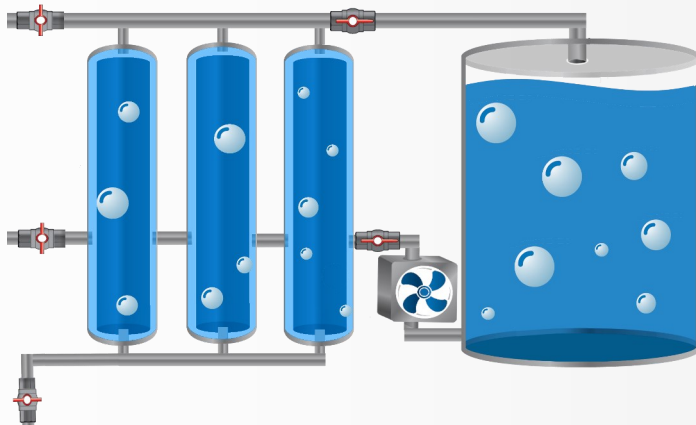
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Practical application



Cleaning method 3

(Variant for alternative filter materials, does NOT apply to Dow Filmtec™ PA filters)

The filters are sporadically loaded with cleaning solution via a special cleaning circuit. The cleaning solutions can be stacked and used multiple times.

We recommend cleaning any pre-filters separately beforehand.

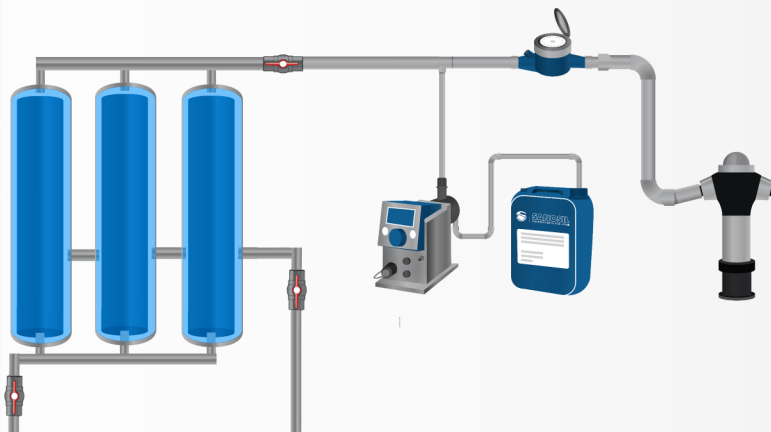
1. Rinse with alkaline cleaning solution containing Sanosil **MC-A: 0.5-2% for approx. 30 minutes**. The pH value of the solution at 25°C should not exceed 12. Then rinse thoroughly.

2. Then treat the filter for approx. **30 min with 0.5-2% Sanosil MC-S** solution. Afterwards, slowly **add 0.3-0.5% Sanosil Super 25 or 2-3.5% Sanosil S015** directly to the cleaning solution (without prior intermediate rinsing). Allow to circulate for approximately 1-3 hours and rinse well. Caution: the synergistic effect of MC-S and Sanosil disinfectant solution may cause a pressure build-up in tightly closed systems. Any non-toxic gases that develop (oxygen, CO₂) must be able to escape.

Appendix: Continuous disinfection

Prophylactic disinfectant treatment

(for alternative filter materials, does NOT apply to Filmtec™ PA filters)



If possible, biofouling should always be removed from Filmtec™ polyamide filters via intermittent shock disinfection after first cleaning the membranes. Otherwise, any iron deposits on the membrane surface might undergo a catalytic reaction with the hydrogen peroxide and damage the membrane.

For alternative filter membrane materials, a small dose of disinfectant can be added at regular intervals to the raw water between cleaning cycles. This significantly prevents/delays the formation of new biofilms. The following dosages are approximate guidelines:

Add every 8 hours: 0.01 ml Sanosil Super 25 or 0.07 ml Sanosil S015 per litre of water for 15-20 minutes OR
Add every 24 hours: 0.02 ml Sanosil Super 25 or 0.15 ml Sanosil S015 per litre of water for 15-20 minutes

Our application notes, both in written and verbal form:

We provide advice to the best of our current knowledge, but without any obligation insofar as the application and storage are beyond our direct control. Product descriptions or information about the properties of the preparations do not contain any statements concerning liability for any damage.



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Filter membrane cleaning and disinfection

Appendix: Membrane filter technology - a brief

Membrane filter technology relies on membranes built into filters as a barrier to separate mixtures of substances. The membranes allow certain molecules or particles to pass through and block others. This makes efficient water and wastewater treatment possible for industry, food processing and pharmaceuticals.

Depending on the separation efficiency of the membranes installed in the filters, the following terms are used:

- **Microfiltration (MF)**

Microfiltration removes particles in the range of about 0.1 to 1 micron. Suspended particles and large colloids are generally rejected, while macromolecules and dissolved solids pass through the MF membrane. Microfilters do not always consist of membranes. Sintered ceramic materials can also be used for this purpose.

- **Ultrafiltration (UF)**

Ultrafiltration makes it possible to remove particles with a diameter of around 20 to 0.1 microns (e.g. viruses). Dissolved salts and smaller molecules pass through the membrane.

- **Nanofiltration (NF)**

Nanofiltration uses a membrane that falls between ultrafiltration and osmosis, which retains particles with a size of approximately 1 nanometre. NF operates in the range between UF and reverse osmosis. Organic molecules with a molecular weight of more than 200 to 400 are rejected. Around 20 to 98% of dissolved salts are also retained.

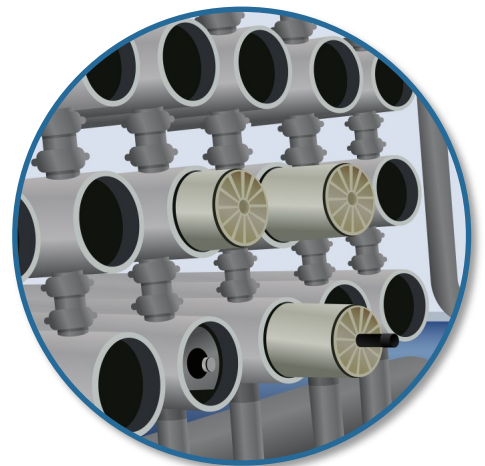
- **Reverse osmosis (RO)**

Reverse osmosis is one of the finest filtration stages available. The reverse osmosis membrane functions as a barrier to all dissolved salts and inorganic and organic molecules with a molecular weight greater than about 100. Reverse osmosis can be used to generate water of the purest quality (permeate).

For industrial water treatment, several filters of different sizes are generally installed one after the other, with the water being forced through the filters at 2-6 bar pressure. While particle filters remove the filtered solids from the system through intermittent backwashing, reverse osmosis continuously flushes the retained salts (concentrate) out of the system.

Filter materials:

Membrane filters can consist of different polymers, including polyamide (PA), cellulose acetate (CA), polysulfone (PS) or polyethersulfone (PES). Membrane filters from market leader Dow Chemical Filmtec TM, which are widely used in industrial water treatment, are made of polyamide. The application techniques described in this brochure therefore primarily refer to Filmtec TM membranes.



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