


**Somicon AG**  
Membrane and Process Technology  
Basel - Switzerland



**MembraClean<sup>®</sup>**  
**Plus**

For a safe and complete disinfection of

Reverse Osmosis Membranes  
Nanofiltration Membranes  
Ultrafiltration Membranes  
Microfiltration Membranes  
Electrodialysis Systems  
Dialysis System  
Degassing Membranes

## MembraClean® Plus

### MembraClean® Plus

The growth of bacteria and other biological species in membrane plants and modules is a serious problem. MembraClean® Plus has been developed to eliminate this problem. In contrast to most other chemicals, MembraClean® Plus does not produce any undesired products nor it damages the membranes when used according to suggested method. Unlike other products which either do an incomplete bacterial removal or destroy the membranes, MembraClean® Plus has substantially high disinfection properties and it does not attack membrane polymer when used according to suggested method.

MembraClean® Plus has been designed to attack the DNA of bacteria specifically. This is done by imparting a neutral surface charge to the disinfecting molecule which enables a rapid diffusion through the cell membrane.

MembraClean® Plus is safe to use, it can be transported without any special precaution or restriction. It is approved for transport in commercial airplanes.

### Compatibility with Membranes

MembraClean® Plus has been tested **continuously** for more than **2500** hours without any adverse effect to the following membranes:

Membrane Polymer	Results	Examples
Polyamide	No change in membrane properties	Nitto-579, ESPA1, Desal 3, AFC30, ESNA, LF10, Desal-Osmonics DL
Pulysufone	No change in membrane properties	PU120,
Polyethersulfone	No change in membrane properties	NTR-7450, ES404,
Polypiprazine	No change in membrane properties	Toray 710, Toray 610
Cellulose Acetate	No change in membrane properties	CDA 16,
Polyacrylonitrile	No change in membrane properties	AN 620
PVDF	No change in membrane properties	FP 20, FPA 200

These membranes represent practically all materials commonly used for RO, NF, and UF Membranes.

### Disinfection Properties

MembraClean® Plus on account of its supreme DNA diffusivity is usable for reducing all kind of bacteria, viruses and fungal matter.

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### Removal of bio-fouling Films

Unlike most disinfecting chemicals, MembraClean® Plus destroys and subsequently dislodge the bio-film in such a manner that a simple rinse with suitable anionic surfactant is sufficient to remove the bio matter from membrane modules. If highly contaminated membrane modules are to be cleaned, it is advisable to use sufficient cleaning solution and rinse solution quantity.

### Comparison of MembraClean® Plus with other agents

In order to see the advantages of MembraClean® Plus, a comparison of various disinfectants is given below:

Disinfectant	Disinfection Efficiency	Membrane Stability	By-Products	Dangers	Cost
NaOCl	Complete disinfection	RO/NF (polyamide and polypiperazine membranes destroyed)	Formation of aromatic chlorides	Corrosion, formation of carcinogenic compounds	low
ClO <sub>2</sub>	Complete disinfection	RO/NF (polyamide and polypiperazine membranes destroyed)	Formation of chlorate	Corrosion, formation of carcinogenic compounds	low
O <sub>3</sub>	Complete disinfection	RO/NF (polyamide and polypiperazine membranes destroyed)	none	Corrosion, formation of carcinogenic compounds	high
Cl <sub>2</sub>	Complete disinfection	RO/NF (polyamide and polypiperazine membranes destroyed)	Formation of HCl and hence corrosion	Handling, corrosion	low
H <sub>2</sub> O <sub>2</sub>	Complete disinfection	Limited tolerance	none	none	high
ClO <sub>3</sub>	Complete disinfection	RO/NF (polyamide and polypiperazine membranes destroyed)	Formation of organic chlorides	Handling, corrosion	low
Per acetic acid	Partial disinfection	Limited tolerance			high
Other Halogen Compounds	Complete disinfection	RO/NF (polyamide and polypiperazine membranes destroyed)	Formation of AOX	Handling, carcinogenic compounds	Low to high
MembraClean® Plus	Complete disinfection	Membranes are long time stable at suggested concentration	NaCl, harmless	none	low

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### Recommended Disinfection

Although the disinfection methods will vary from case to case, a general scheme which can be followed is as follows:

#### Regular Disinfection

The Feed stream can be dosed at a rate of 500 g MembraClean® Plus per m<sup>3</sup> of Feed for a few hours every week. This will help to keep the bio-fouling within control. Please note that MembraClean® Plus has a rejection similar to NaCl on any given RO membrane. Traces of MembraClean® Plus in permeate do not pose any health hazard as MembraClean® Plus disintegrates into NaCl and water.

#### Plant Disinfection

- Use RO permeate or de-ionized water to prepare the cleaning solution, preferable at pH between 6.0 to 7.0. Higher pH will reduce the efficiency of MembraClean® Plus drastically.
- For normal fouling loads, a concentration of 0.5 - 1.0 kg/m<sup>3</sup> MembraClean® Plus should be used for 1-2 hours in circulating mode.
- For extreme fouling load, a concentration of 1-3 kg/m<sup>3</sup> MembraClean® Plus is recommended in circulating mode. The cleaning should be carried out at least for two hours.
- For special situations, contact Somicon AG.

### Safety Considerations

- Avoid direct skin contact. In case of skin contact, rinse with plenty of water.
- Avoid ingestion. In case of accidental ingestion, drink plenty of water and seek medical advice.
- Wear eye protection when handling MembraClean® Plus. In case of eye contact, thoroughly flush the eye with water and seek medical help.
- Please consult the safety data sheet before use.
- MembraClean® Plus is approved as non hazardous material and can be transported by all means without any special safety precautions.
- No special environmental discharge requirements are necessary to dispose spent or fresh MembraClean® Plus solution.
- **MembraClean® Plus is registered at Swiss Ministry of Health (T No. 621000) and classified as non-toxic and hence usable for food & potable water plants.**

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Our experience is your advantage