



## Preservation of Reverse Osmosis and Nano-Filtration membranes and systems during system outages.

**It is recommended to preserve membrane systems when the unit is out of production for more than 24 hours. Failure to preserve membranes may result in the development of biofilm on the membrane surface, causing operation problems such as increased pressure drops and lower normalized permeate flow to occur.**

### Methods of preservation

#### 1. Preservation with sodiumbisulfite (1%).

It is recommended to measure the pH regularly. A fresh solution is needed when the pH < 3.

A fresh solution is also needed when the liquid becomes turbid or changes colour.

Regular inspections (weekly) are recommended.

It has to be verified that the plastic materials (including pressure vessels) used in the membrane plant are resistant to sodiumbisulfite . Otherwise cracks might occur in the plastic materials .

#### 2. Preservation with PermaClean® PC-56.

<u>Preservation period</u>	<u>Concentration PermaClean® PC-56</u>
< 2 days	0.018% (180 ppm)
2 - 7 days	0.036% (360 ppm)
1 - 4 weeks	0.054% (540 ppm)
1 - 6 months	0.09 % (900 ppm)
> 6 months	drain and refill

This preservation method can only be applied after the membranes have been in operation for a minimum of 1 month.

#### 3. Preservation with PermaClean® PC- 55.

<u>Preservation period</u>	<u>Concentration Permaclean® PC- 55</u>
< 2 days	0.01% (100 ppm)
2 - 7 days	0.02% (200 ppm)
1 - 4 weeks	0.03% (300 ppm)
1 - 6 months	0.05 % (500 ppm)
> 6 months	drain and refill

This preservation method can only be applied after the membranes have been in operation for a minimum of 1 month



**4. Preservation with formaldehyde.**

0.5% - 3% (w/w) formaldehyde solutions can be applied dependent on the membrane supplier's recommendations. The preservation solution needs to be renewed latest after 12 months.

Formaldehyde handling requires more precautions due to its suspected carcinogenic. Please stick to the relevant safety regulations.

**5. Preservation with glutaraldehyde and other aldehydes.**

It is strongly recommended not to use glutaraldehyde or other aldehydes as it can reduce the permeate flow of the membranes dramatically.

**5. Preservation with PermaClean® PC-11 and is not recommended due to the very short half life of this chemistry.**

**NOTE:** Prior to shutdown, RO/NF membranes need to be cleaned (dependent on the operation parameters). The system then **MUST** be flushed with RO permeate before the preservation solution can be pumped into the RO (at low pressure).