SHUTTING DOWN THE REVERSE OSMOSIS UNIT **Protection against bacterial proliferation in reverse osmosis membranes**	**EXP 48**

Shutting down a reverse osmosis installation causes the water to stagnate inside the osmotic modules. This can cause bacteria to proliferate on the membrane surface and foul the membranes prematurely.

The extent of this bacterial development depends on settings like the quality and temperature of the inflowing water or the room temperature of the water treatment premises.

- for temperatures of around 15 to 25°C, an installation can be shut down for 96 hours without a preservation procedure.

- for temperatures higher than 25°C, an installation cannot be shut down for more than 48 hours without a preservation procedure.

In the remedial phase it is necessary to disinfect with hydrogen peroxide at 0.2% (in weight) before restarting and use of the treated water.

In the preventive phase (prolonged shut-down exceeding 96 or 48 hours depending on temperature), osmosis membranes must be preserved in sodium bisulphite solution $NaHSO_3$. Its bacteriostatic properties prevent bacteria from proliferating in the membranes.

OPERATING PROCEDURE

Prepare a solution of sodium bisulphite at 1 % (in weight). It is preferable to dilute with osmosed water or else with pre-treated water.

For a commercially available solution of sodium bisulphite at 37.5 %, dilute 1 litre of the solution in 60 litres of water (osmosed or pre-treated).

INJECTION

In a pan, prepare a sufficient volume of solution at 1% to fill all pipes and pressure elements constituting the reverse osmosis unit.

Turn off the reverse osmosis unit and close the supply valve controlling the water to be treated.

Inject the solution at 1 % by using a pump built into the apparatus. The solution can also be injected by means of a dropper situated upstream from the reverse osmosis unit.

Inject the necessary volume of solution until bisulphite appears in the discharge outlet. Bisulphite can quickly be detected by its typically sulphuric smell. Once the solution has been injected, isolate the device by closing all the valves (inlet, discharge outlet, permeate outlet if necessary).

N.B. in the event of a prolonged shut-down, the solution must be renewed every 2 months according to the same procedure.

RESTARTING THE INSTALLATION

Once pre-treatment has been resumed and the upstream pipes sufficiently bled to renew the stagnant water, open the inlet, discharge and if necessary, the permeate valves on the reverse osmosis unit.

Note **:** check that all valves have been opened in order to avoid the irreversible deterioration of the osmosis membranes.

Disconnect the production outlet on the reverse osmosis unit (permeate) and direct it through the drain.

Turn on the high pressure pumps. Adjust the various settings : flow, pressure, according to instructions.

Rinse out the reverse osmosis unit for approx. two hours in order to eliminate all traces of bisulphite.

Re-connect the production outlet.

The reverse osmosis unit is ready to resume operation.