DISINFECTION OF ION-EXCHANGING RESINS USED IN SOFTENING TREATMENTS	EXP 14

By virtue of their properties, ion-exchanging resins can be the seat of fairly abundant bacterial pollution which may cause problems during regeneration or production.

It may then be necessary to disinfect the resins regardless of whether they are cationic or anionic.

A number of chemical substances can be used for this purpose :

- Sodium hypochlorite
- Hydrogen peroxide
- Peracetic acid

The use of any other substance must be authorised by PERMO.

N.B.

Before disinfecting ion-exchanging resins, make sure that the latter are exhausted (end of cycle).

NOTE : Disinfection requires the use of chemical substances. Basic safety rules must be adhered to concerning the use and handling of these substances. Consult a chemical manufacturer or supplier for further details.

Generally speaking, it is best to dilute disinfectants with softened water or else with raw water.

CHOICE OF DISINFECTANT REAGENT

Verify the compatibility of the equipment (valves, pumps, etc.) in order to determine the choice of disinfectant reagent.

The use of formaldehyde is strictly banned.

CHOICE OF CONCENTRATION

Sodium hypochlorite : prepare a solution of 10 mg cl_2/litre.

Hydrogen peroxide : prepare a solution at 0.5 % (in weight).

As hydrogen peroxide is a powerful oxidising agent, be careful not to exceed these values for fear of destroying the ion exchangers permanently.

Dialox, P3 Oxonia, Oxy-Anios 5, Oxy-Aniolyse : a mixture of hydrogen peroxide and peracetic acid, this products are used at 0.5% concentration (in weight).

TABLE SHOWING DILUTIONS FOR DISINFECTANT REAGENTS

Disinfectants	Concentration in weight of the commercially available solution	Concentration in weight of the disinfectant solution to be flushed over the ion exchangers	Volume of commercially available solution to be used for 100 l of diluting water
Hydrogen peroxide	30 %	0.5 %	1.5 l.
	35 %	0.5 %	1.3 l.
	50 %	0.2 %	0.3 l.
		0.5 %	0.8 l.
Dialox	-	0.5 %	12.5 l.
Oxy-Anios 5	-	0.5 %	1.5 l.
Oxy-Aniolyse	-	0.5 %	12.5 l.
P3 Oxonia	-	0.5 %	1.5 l.
Sodium hypochlorite	36° chlorometric (114 g cl2/litre)	10 mg/l	9 ml

OPERATING PROCEDURE

N.B.

Before flushing disinfectants over the resins, check that :

- the resins are exhausted (end of cycle),
- the installation being disinfected is perfectly isolated from the production outlet and that no accidental handling can pollute the stores of treated water the outlets towards the treated water.

The disinfectant is generally injected manually by operating the appropriate valves or electrovalves so as to flush the solution downstream over the resins before it is drained away (see explanatory diagrams).

The volume of prepared solution must be approx. 1.5 times greater than the volume of the resin being disinfected.

Flush the disinfectant through by means of a pump or by using the raw water release pan situated upstream if available.

It may also be possible to suction the disinfectant solution by means of the apparatus' hydroejector. In this case, the dilution achieved by the hydroejector's driving water must be taken into account for the preparation of its primary solution.

Once the disinfectant appears in the drain outlet of the apparatus being treated (see testing methods), turn off the installation and leave the disinfectant in contact with the ion exchangers.

Table of contact times

Disinfectant	Time	
Hydrogen peroxide	min.	30 minutes
	max.	1 hour
Dialox Oxy-Anios 5 Oxy-Aniolyse P3 Oxonia	min.	30 minutes
	max.	1 hour
Sodium hypochlorite	min.	30 minutes
	max.	1 hour

Rinsing the ion exchangers

Once the appropriate time has elapsed, rinse the resins with raw water at a flow rate of approx. 6 l/litre of resin/hour.

The same methods can be used as with injection of the disinfectant (pump, upstream release pan).

The ion exchangers must be rinsed until no traces of the disinfectant remain, by performing regular tests at the drain owlet (see testing methods).

Table of estimated rinsing times

Disinfectant	Minimum time
Hydrogen peroxide	2 hours
Dialox Oxy-Anios 5 Oxy-Aniolyse P3 Oxonia	2 hours
Sodium hypochlorite	2 hours

Once the ion exchangers have been properly rinsed (all traces of disinfectant eliminated), proceed with regeneration in accordance with the usual procedures.

The resumption of production must be subject to a test for the absence of disinfectant in the treated water.

Methods for testing disinfectants

A number of ready-to-use products are commercially available for testing disinfectants quickly (Strips, tintometers, etc.).

An accurate quantitative lab test can be performed.

EXPLANATORY DIAGRAM