

Nitrate Removal Systems



A nitrate removal system will remove nitrate from water. The most common nitrate removal method is by ion exchange resin. Point of use filters can give enough water for one tap or point of entry systems can treat the water for the whole house or factory.



Why remove nitrate ?

Nitrate levels in many waters are often high. Over 60% of nitrate enters water from agricultural land. High concentrations of nitrate in water can cause methaemoglobinaemia in very young children (blue baby syndrome). In extreme cases this can be fatal. The nitrate is converted to nitrite in the body which in turn interferes with oxygen up take in the blood. The current regulatory standard of 50 mg/l nitrate is derived from the standard in the European Union's Drinking Water Directive, which is intended to ensure that drinking water will not cause methaemoglobinaemia.

How do I remove Nitrate ?

The most common method of removing nitrate is with an ion exchange resin. The nitrate rich water passes over a resin where the nitrate is exchanged for chloride ions. When no more nitrate can be exchanged the resin needs to be replaced or regenerated by rinsing with salt.

Reverse Osmosis can also remove nitrate from water. The water passes through very small pores at a high pressure. This combination stops most contaminants just allowing water molecules through. However RO systems are relatively expensive, may require the water to be pre-treated, and often remove beneficial minerals. They also give relatively low flow rates (litres/day).

Point of Use or Point of Entry ?



Point of Entry ion exchange systems consist of a vessel through which the water flows, down through the ion exchange media where the nitrate is held. These systems are big enough to treat the water for the whole house (treating the drinking water, bathroom water, hot water, dishwasher water etc). The systems have automatic regeneration with salt so are always ready for use. These Point of Entry systems fit under the sink or in a utility rooms.



Point of Use means removing the nitrate at the point of wanting it, say at the drinking water tap. This has the advantage of only treating the water that you are going to drink without the expense of treating all the other water. Under sink filters can be fitted so water is bled of the incoming cold supply through the nitrate ion exchange filter or RO system and then up to a dedicated tap. The filters however can only treat a small amount of water and need their own tap. They can not be regenerated and need to be replaced every few months.



How to size. (Point of entry)

On average 160 litres of water is used per person per day. This normally occurs in two peak periods, one in the morning and one in the evening. A family of four typically uses 700 litres of water per day but may use 300 litres in an hour in the morning. Larger households, farms, stables and irrigations systems all use more water.

When sizing a system the average flow and the peak flow rate need to be taken into account. Try and size a system to run for 3 days without regenerating or a duplex for 12 hours. The vessel size is often given as the diameter and the height (in inches).

Recommended operating pressure range 20 to 120 psi., Water temperature range from 2 to 38°C

Nitrate System Specification (Simplex)

Resin Vol (l)	Vessel Ø" X h"	Flow m3/h	Capacity@ 50ppm NO ₃	Valve Type	Salt (Kg)	BT Vol	BT (B2)	BT (H2)	Ves (B1)	Ves (H1)
15*	665x270x460	0.6	6	255	2.5					
22*	820x275x440	0.9	8.8	255/WS1	3.7					
25*	1190x325x520	1.0	10	255/WS1	4.2					
35*	1190x325x520	1.4	14	255/WS1	6					
35	10-44	1.4	14	255/WS1	6	125	432 ^R	839	269	1124
42	10-54	1.7	17	255/WS1	7	125	432 ^R	839	269	1387
50	12-48	2.0	20	255/WS1	8.5	125	432 ^R	839	315	1235
75	13-54	3.0	30	268/WS1	12.7	200	670	830	341	1374
100	14-65	4.0	40	268/WS1	17	300	760	1000	380	1660
150	16-65	6.0	60	278/WS125	25	400	870	930	420	1660
200	18-65	6/7	80	278/WS125	34	400	870	930	510	1750
250	21-60	10	100	298/WS1.5	42	400	870	930	552	1640
350	24-69	14	140	298/WS2	60	500	860	1230	610	1890
500	30-72	17/20	200	298/WS2	85	750	1000	1100	770	2050
700	36-72	17/26	280	298/WS2	119	750	1000	1100	927	2150
1000	42-78	40	400	WS3	170	1000	1070	1290	1074	2435
1250	48-82	50	500	WS3	213	1750	1260	1500	1226	2450
2250	55-120	55	900	WS3	382	1750	1260	1500	1429	3081



Autotrol Valves			
Valve	Inlet/ outlet	Drain	HV
255	¾"	½"	200
268/278	1"	¾"	210
298	2"	1½"	291

Clack Valves			
Valve	Inlet/ outlet	Drain	HV
WS1	1"	1"	180
WS125	1¼"	1"	180
WS15	1½"	1"	182
WS2	2"	1½"	217
WS2H	2"	2"	295
WS3	3"	3"	320

Duplex Systems

Duplex nitrate reduction systems are readily available. Please consult us for sizing and specifications.

Softeners, and iron and manganese removal systems are also available as are other medias such as pH correction, sand, carbon etc

* Cabinet systems with an in built salt bin.

^R – rectangular brine tank with this as the size of the largest side. Vol is in litres, and height and width in mm unless otherwise stated

Sizes and dimensions are for indication purposes only and may change without notice.

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