

# 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, dishwater 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)

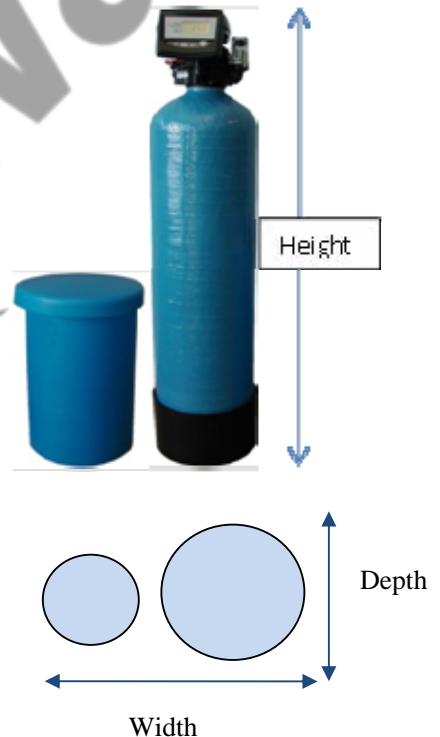
On average 160 litres of water is used per person per day. This normally occurs in two peak periods, one in the morning and one in the evening. A family of four typically uses 700 litres of water per day but may use 300 litres in an hour in the morning. Larger households, farms, stables and irrigations systems all use more water. Capacity is the amount of water produced between regenerations (m<sup>3</sup>).

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)	Service Flow m <sup>3</sup> /h	Treated Qty m <sup>3</sup> @ 50NO <sub>3</sub>	Salt used / regen Kg	Connections In / Out	Max Footprint		
					Width mm	Depth mm	Height mm
* 10	0.4	4	1.7	¾"	275	440	635
* 15	0.6	6	2.5	¾"	275	440	695
* 22	0.9	8.8	3.7	¾" or 1"	275	440	815
* 25	1	10	4.2	¾" or 1"	325	520	1190
* 35	1.4	14	6	¾" or 1"	325	520	1190
35	1.4	14	6	¾" or 1"	719	440	1324
42	1.7	17	7	¾" or 1"	719	440	1587
50	2	20	8.5	¾" or 1"	765	440	1538
75	3	30	13	1"	1005	680	1548
100	4	40	17	1"	1139	760	1870
150	6	60	25	1" or 1¼"	1296	880	1870
200	5.7 or 6	80	34	1" or 1¼"	1359	880	1997
250	10	100	42	1" or 1½"	1442	880	1921
350	14	140	60	2"	1500	880	2171
500	17 or 20	200	85	2"	1810	1030	2341
700	17 or 26	280	119	2"	1967	1030	2441
1000	40	400	170	2"	2185	1100	2755
1250	50	500	213	2"	2536	1300	2770
2250	55	900	382	2"	2739	1429	3401



### 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.

\*10L to 35L Have in built salt bin.

35L to 50L Use a rectangular brine tank.

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