Organic Scavenger (Colour) Removal

Colour in water is normally due to iron and manganese or organic tannins (often from peaty water). If the colour is due to tannins the colour can be reduced by specialised ion exchange resins

Where does colour come from?

Colour in water (after it has been filtered) is typically caused by both iron and manganese compounds or by organic compounds. If the colour is due to iron or manganese there are specific treatments (see the iron and manganese data sheets). If the colour is due to organics then treatment is normally by ion exchange or activated carbon. Organic colour comes from decaying vegetation and may be completely soluble or particulate. Tannins (Humic and Fumic acids) are by far the most common class of compounds and give the water a yellow/brown tint. In highland areas where water runs off peat the water can be virtually brown.

Colour Removal

The two most common forms of colour removal are ion exchange resins or by specialised activated carbon

by Ion Exchange

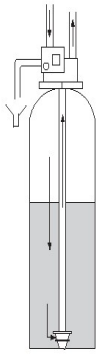
When the water passes through anion resin beads the organic molecules are bound to the resin. When the resin has become saturated and can hold no more colour forming compounds they need to be removed. Resin selection is critical as many require caustic soda to remove the organics. However there are resins available which can be regenerated with brine on its own or in combination with caustic. Brine has the advantage of being readily available and safe. Typically every 25 litres of resin will take out 2000 ppm of organic colour before it needs regenerating. Flow rates are reasonably fast, typically 12 to 15 times the volume of resin.

by Activated Carbon

AC absorbs the organic colour. These systems are particularly useful when the colour levels are very low or the amount of water required is very low or more usefully as a polisher as a final treatment. Once the carbon is exhausted it needs to be discarded and new carbon put in. Phosphate rich activated carbons are particularly good at holding organic colour as well as some metals. The time the water needs to be in contact with the carbon is very long so flow rates are correspondingly very slow. Trickle feed systems are by far the best option or using the system as a final polisher is a good option.

How does Ion exchange colour removal work?

An automatic colour removal ion exchange system consists of a pressure vessel filled with resin. Located on the top of the pressure vessel is the control valve. The water is passed through the control valve and down through the vessel. As the water passes across the resin bed, the colour compounds attach to the resin. Periodically, depending on how much water is used, the resin needs to be refreshed. This is done by flushing a small amount of salt (stored in an external brine tank), though the resin vessel. Once this process has been completed the resin is refreshed and ready to begin again.

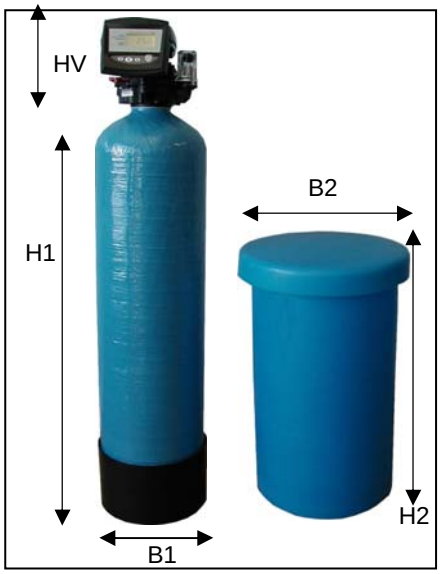


How to size. (Ion exchange unit)
On average 160 litres of water is used per person per day. This normally occurs in two peak periods, one in the morning and one in the evening. A family of four typically uses 700 litres of water per day but may use 300 litres in an hour in the morning. Larger households, 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). When commissioning a system regenerate it each night and gradually extend the run times if it is applicable. Never run without regenerating as the resin can get irreversibly fouled if not kept clean. Simplex systems normally regenerate on a time base, duplex on a flow.
Recommended operating pressure range 20 to 120 psi., Water temperature range from 2 to 38°C

Organic Scavenger (Colour) Removal Specification (Simplex)

Resin Vol (l)	Vessel Ø" X h"	Flow m3/h	Valve Type	Salt (Kg)	BT Vol	BT (B2)	BT (H2)	Ves (B1)	Ves (H1)
50	12-52	**0.7**	255/WS1	12.5	125	432 [R]	839	315	1338
75	13-54	**1.1**	255/WS1	18.7	200	670	830	341	1374
100	14-65	**1.5**	278/WS1	25	400	870	930	380	1660
150	16-65	**2.3**	278/WS1	37	400	870	930	420	1660
200	18-65	**3**	278/WS1	50	400	870	930	510	1750
250	21-60	**3.4**	298/WS1.5	62	500	860	1230	552	1640
350	24-69	**5.2**	298/WS2	87	500	860	1230	610	1890
500	30-72	**7.5**	298/WS2	125	750	1000	1100	770	2050
700	36-72	**10.5**	298/WS2	175	750	1000	1100	927	2150



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 systems are readily available. Please consult us for sizing and specifications**.**

Activated Carbon Unit Sizing
See carbon data sheet

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. Volume 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.