Lakeside

Commercial Softeners, Servicing and Salt

Effects Of Hard Water

The need to reduce the hardness of water is the most common form of water treatment. Hard water is created when naturally soft rain water percolates through subterranean rock strata and dissolves many solids including, in particular, calcium and magnesium. There are many areas therefore, where the supply water contains a significant level of these salts. It is called "hard water" because of the hard deposits created when this type of water is used in many applications.

The deposits are often called scale. However, it is actually more like concrete, forming a thick coating on heat exchanging elements and the inside of boilers, tanks and pipes. In addition, the hard minerals left in solution significantly detract from the performance of soaps and detergents which then have to be used in greater quantities to achieve the necessary cleaning performance. This not only adds to the level of deposits occurring inside systems and equipment, it also adds significantly to the chemical waste discharged into our sewer systems.

The other main problem created by scale build up is the reduction in efficiency of all heat exchange systems due to the insulating effect of the deposit. This will increase the energy costs and, in addition, can create overheating on the surfaces of the heat source, thereby causing premature failure.

The Solutions

A cost effective way to solve these problems is to remove the dissolved hard mineral salts from the water, replacing or exchanging them with "soft salts" which are more soluble and therefore do not form hard scale. This is achieved by using one of our wide range of fully automatic water softeners.

They work by a process known as ion exchange. Hard water passes through a high quality exchange resin column inside a pressure vessel removing the calcium and magnesium ions from the solution and exchanges them for sodium ions. When the resin is about to become exhausted the softener commences the regeneration phase which is initiated by timer or volume control. Regeneration is achieved when the softener draws a solution of common salt - called brine - through the column of resin which displaces the captured calcium and magnesium ions and replaces them with the sodium ions in the brine. Throughout the regeneration period the unwanted ions and all the subsequent rinsing is flushed to drain and does not enter the service line.

The regeneration period takes between 60 and 120 minutes depending upon the size of the softener and it can be repeated as often as necessary over many years without significant loss of performance.

Simplex Softeners

Simplex or single column water softeners are best suited to steady demand applications up to moderate capacities for the domestic and commercial markets.

Regeneration is programmed to occur during low water usage periods – typically 2 am. However, instantaneous regen systems are available. During the regeneration cycle, simplex systems will normally bypass hard water to service to maintain supply unless otherwise specified.

Generally, simplex softeners will need to be sized to give at least one day's supply of softened water output before regeneration.

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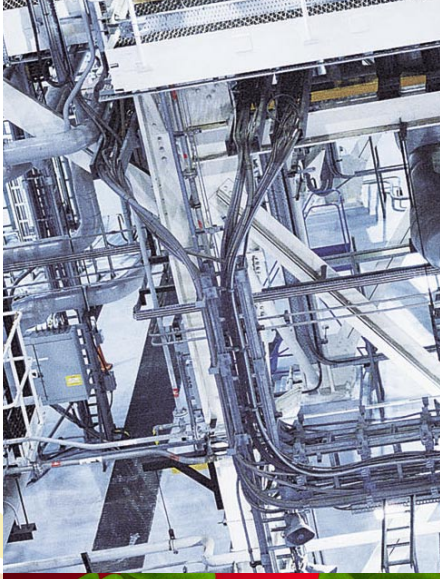

Duplex Softeners

Duplex softeners give a continous supply of softened water.

Duplex systems use two resin columns, one in service, the second on standby. The water flow to service is metered and when the service column is exhausted, the control valve automatically switches, putting the second unit on line.

The exhausted resin in the first column is then regenerated and remains on standby until the second column is exhausted, the the valve switches back to the first column again.

Duplex softeners are normally sized to give one regeneration per column per day, but each column can be regenerated more frequently if required. Parallel run systems with both vessels on line at the same time are also available.

Lakeside Maintenance – Meeting the customers needs

Regular servicing is the key to successful trouble free operation.
We recommend an annual service check to maintain the efficiency of your system, reduce the likelihood of breakdown and increase product life.

Lakeside has a nationwide service base; Our service team are fully qualified and trained in all aspects of water softener products. Our aim is to prolong the life of Your equipment.

Salt & Chemical Deliveries

Lakeside supply salt and chemical deliveries to customers on a daily basis, we supply small to bulk orders including pumped product delivered directly to site.
COSHH Sheets are available upon request for all products supplied.

Valve Specification

Softener control valves are sized and specified according to the flow rate required by the application. The inlet and outlet connection ports generally range between ¾ - 3 inches for standard control valves with flow rates up to 50m³ per hour.

Steady demand applications are suitable for either timer control or volume control. Variable demand systems are better served by using volume control via in-built metering.

Specifying and Sizing

Fundamentally, the size of a water softener is governed by the amount of exchange capacity that is required for the application. The capacity of ion exchange resin is a function of the volume of water that passed through it, the hardness of the incoming water, and the regeneration brine setting.

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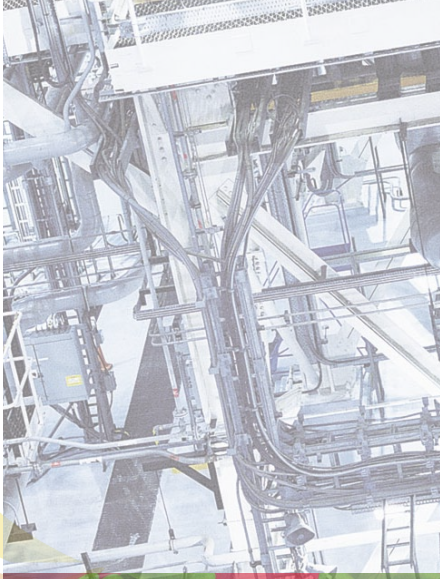
On the chart (overleaf) we show the capacity of each size of softener assuming the feed water has a hardness of 300mg/litre (21 degrees Clarke) and a brining rate of 140g NaCl per litre of resin. The volume can be adjusted on a pro-rata basis for different levels of hardness. Another important criteria to consider is the continuous flow rate required. This affects the size of valve that can be used and sometimes the size of the resin column, since the water needs to have a minimum contact time with the resin to achieve full softening. Short term higher peak flows can be tolerated, but this sometimes results in a low level of hardness passing through into service and can increase the pressure drop across the softener.

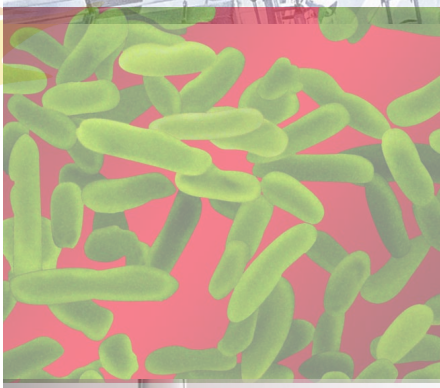
At design flow rates you can expect a pressure drop of between 10-15 psi. Usually, all automatic water softeners need a minimum supply water pressure of 25 psi and can operate up to at least 100 psi. All these softeners require an electrical supply of 240 Volts and come with 24 Volt transformers (except for 5600 Mechanical Valves).

Automatic water softeners need a supply of appropriate salt to make the required brine for regeneration purposes. Salt is most commonly supplied in 25 kg bags of either granular or pellet type. This type of salt is manufactured specifically for water softening purposes and has a very high purity level.

Sometimes on very large systems P.V.D. salt can be supplied in bulk. Other types of salt should not be used due to the levels of impurity or additives. The only attention required from the user is to check on a regular basis that the level of salt in the brine tank is kept topped up to ensure a saturated brine solution is available for regeneration.

Although softeners are very reliable, as with any other piece of essential plant, routine servicing is strongly recommended. This is generally straight forward and will ensure many years of reliable service from the plant.





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Simplex Water Softener Range

Softener Size (litres of resin)	10	14	20	25	30	40	50	60	75	80	100	120	140	190	250	350	500	750	1000
Flow rate information																			
Capacity at 300ppm																			
Total Hardness (m3)	1.67	2.34	3.34	4.18	5.01	6.68	8.35	10.02	12.53	13.36	16.70	20.04	23.38	31.73	41.75	58.45	83.50	125.25	167.00
Service Flow m3/hour	0.40	0.56	0.80	1.00	1.20	1.60	2.00	2.40	3.00	3.20	4.00	4.80	5.60	7.60	10.00	14.00	20.00	30.00	40.00
Regen Information																			
Salt used per regen (kgs)	1.40	1.96	2.80	3.50	4.20	5.60	7.00	8.40	10.50	11.20	14.00	16.80	19.60	26.60	35.00	49.00	70.00	105.00	140.00
Total Water used per regen (m3)	0.069	0.070	0.104	0.115	0.175	0.217	0.219	0.363	0.394	0.398	0.582	0.590	0.810	0.920	1.734	2.317	3.467	4.814	6.737
Max Flow to drain (litres per min)	4.54	4.54	4.54	5.68	9.08	9.08	9.08	13.25	15.14	15.14	18.93	18.93	26.50	32.17	37.85	56.78	94.63	132.48	170.33
Max Flow Period (minutes)	4	8	8	8	8	12	12	12	12	12	16	16	16	16	20	20	20	20	20
Regen Duration (minutes)	38	38	48	48	68	72	72	72	72	72	96	96	96	96	120	140	140	140	140
Dimensions & Weights																			
Brine Tank Volume (litres)	80	80	80	80	80	120	120	200	200	200	250	250	350	500	500	750	1000	1800	2 x 1800
Salt Storage Capacity (kgs)	80	80	80	80	80	120	120	200	200	200	250	250	350	500	500	750	1000	1800	3600
Brine Tank Dims Dia mm	458	458	458	458	458	462	462	555	555	555	555	555	650	1050	1050	995	1092	1360	1360
Brine Tank Dims Height mm	628	628	628	628	628	800	800	980	980	980	1170	1170	1240	900	900	1310	1350	1520	1520
Vessel Size Dia x Height Inch	8x17	8x22	8x35	9x35	10x35	10x44	10x54	12x48	13x54	13x54	14x65	14x65	16x65	18x65	21x60	24x69	30x72	36x72	42x78
Valve Specifications																			
Clack WS 1" Bsp Inlet/ Outlet ¾" Bsp Drain	Maxi Flow 6.00m3 per hour																		
Fleck 5600 1" Bsp Inlet/ Outlet ½" hose Barb	Maxi Flow 3.80m3 per hour																		
Fleck 2510 1" Bsp Inlet/ Outlet ½" hose Barb					Maxi Flow 5.40m3 per hour														
Fleck 2750 1" Bsp Inlet/ Outlet ½" hose Barb							Maxi Flow 6.80m3 per hour												
Fleck 2850 1.5" Bsp Inlet/Outlet 1" Bsp Drain											Maxi Flow 12.50m3 per hour								
Fleck 2900 2" Bsp Inlet/Outlet ¾" Bsp Drain													Maxi Flow 23.00m3 per hour						
Fleck 3900 3" Bsp Inlet/Outlet 2" Bsp Drain																Maxi Flow 48.00m3 per hour			
Autotrol 255 1" Bsp Inlet/Outlet ½" Bsp Drain	Maxi Flow 3.80m3 per hour																		
Autotrol 268 1 3/4" NPT Inlet/Outlet ¾" Drain									Maxi Flow 6.00m3 per hour										
Autotrol Magnum CV 1.5" Or 2" Inlet/ Outlet ¾" Drain												Maxi Flow 18.00m3 per hour							

PLEASE NOTE : When sizing softeners, please ensure that the valve being used is able to handle the flow rate required by the system. The solid bars denote which size softeners the respective valves can be installed on. All data is approximate and may vary due to site conditions and installation constraints. It should therefore be used as a guide only and suitable over capacity included to facilitate effective operation. Maximum flow rates arebased on manufacturers data, at a pressure drop of 1.8 bar under test conditions, and as such may not always be replicated on site.

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Duplex Water Softener Range

Softener Size (litres of resin)	**10**	**14**	**20**	**25**	**30**	**40**	**50**	**60**	**75**	**80**	**100**	**120**	**140**	**190**	**250**	**350**	**500**	**750**	**1000**
Flow rate information																			
Capacity at 300ppm																			
Total Hardness (m3)	1.67	2.34	3.34	4.18	5.01	6.68	8.35	10.02	12.53	13.36	16.70	20.04	23.38	31.73	41.75	58.45	83.50	125.25	167.00
Service Flow m3/hour	0.40	0.56	0.80	1.00	1.20	1.60	2.00	2.40	3.00	3.20	4.00	4.80	5.60	7.60	10.00	14.00	20.00	30.00	40.00
Regen Information																			
Salt used per regen (kgs)	1.40	1.96	2.80	3.50	4.20	5.60	7.00	8.40	10.50	11.20	14.00	16.80	19.60	26.60	35.00	49.00	70.00	105.00	140.00
Total Water used per regen (m3)	0.142	0.142	0.155	0.176	0.193	0.206	0.325	0.371	0.394	0.394	0.440	0.447	0.758	0.917	1.516	2.317	3.467	4.814	6.737
Max Flow to drain (litres per min)	4.54	4.54	5.68	7.575	9.08	9.08	9.08	13.25	15.14	15.14	18.93	18.93	26.50	26.50	26.50	56.78	94.63	132.48	170.33
Max Flow Period (minutes)	6	6	6	6	6	6	6	6	6	6	6	6	8	10	10	20	20	20	20
Regen Duration (minutes)	70	70	70	70	70	76	80	80	80	80	80	80	94	120	120	140	140	140	140
Dimensions & Weights																			
Brine Tank Volume (litres)	80	80	80	80	80	120	120	200	200	200	250	250	350	500	500	750	1000	1800	2 x 1800
Salt Storage Capacity (kgs)	80	80	80	80	80	120	120	200	200	200	250	250	350	500	500	750	1000	1800	3600
Brine Tank Dims Dia mm	458	458	458	458	458	462	462	555	555	555	555	555	650	1050	1050	995	1092	1360	1360
Brine Tank Dims Height mm	628	628	628	628	628	800	800	980	980	980	1170	1170	1240	900	900	1310	1350	1520	1520
Vessel Size Dia x Height Inch	8x17	8x22	8x35	9x35	10x35	10x44	10x54	12x48	13x54	13x54	14x65	14x65	16x65	18x65	21x60	24x69	30x72	36x72	42x78
Valve Specifications																			
Fleck 9000 – ¾" 1" Bsp Inlet/Outlet ½" Hose Barb	Maximum Flow 3.60m3 per hour																		
Fleck 9000 – 1" 1" Bsp Inlet/Outlet ½" Hose Barb												Maximum Flow 4.40m3 per hour							
Fleck 9500 1.5" Bsp Inlet/Outlet 1" Drain												Maximum Flow 9.60m3 per hour							
Fleck 2900 2" Bsp Inlet/Outlet 1 ¾" Drain															Maximum Flow 23.00m3 per hour				
Fleck 3900 3" Bsp Inlet/Outlet 2" Drain																	Maximum Flow 48.00m3 per hour		
Autotrol Readysoft 1" Bsp Inlet/Outlet ½" Bsp Drain	Maximum Flow 3.80m3 per hour																		
Autotrol Magnum CV 1.5" or 2" Bsp Inlet/Outlet 1.5" Drain											Maximum Flow 18.00m3 per hour								

PLEASE NOTE : When sizing softeners, please ensure that the valve being used is able to handle the flow rate required by the system. The solid bars denote which size softeners the respective valves can be installed on. All data is approximate and may vary due to site conditions and installation constraints. It should therefore be used as a guide only and suitable over capacity included to facilitate effective operation. Maximum flow rates arebased on manufacturers data, at a pressure drop of 1.8 bar under test conditions, and as such may not always be replicated on site.

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