

# DAYLIFF

## DATA SHEET

Water  
Softeners

SF



- The Dayliff SF range of Water Softeners are ion exchange type softeners for the removal of hardness in water. The units have been carefully designed to provide the highest levels of performance for all types of domestic, industrial and institutional applications. Particular features include:-
- Three model range with capacities of 1, 6 and 15 m<sup>3</sup>/hr with higher capacities being available using paired units. The compact SF300 model features the resin vessel mounted inside the brine tank while the larger SF600 & 900 models are supplied with a separate brine tank.
- Technology leading GE Osmonics Autotrol electronic control valves providing fully automatic process control and volumetric regeneration.
- Tried and tested Dayliff CXD non-corroding GRP resin vessels featuring practical clamp-retained access covers, high efficiency under-drains and diffusers and high pressure capacity. The two larger models are fitted with side mount covers for resin access.
- High performance Dow Resin with enhanced exchange capacity and increased life.
- Generously sized brine tanks with all necessary fittings for reliable regeneration.

Dayliff SF softeners provide a most effective, reliable and economic solution for all boiler feed and other general softening requirements. The combination of quality components, integrated design and assured Davis & Shirliff quality ensures efficient and dependable softeners that can be relied upon to give many years of trouble free operation.

## THE SOFTENING PROCESS

The softening process occurs when hardness ions (Calcium and Magnesium) are replaced with Sodium ions in a specially formulated cation resin media. The resin is pre-charged with Sodium ions by a brine rinse process, these being progressively exchanged with Calcium and Magnesium ions until the media is saturated. When this occurs resin regeneration is carried out and the cycle repeated. Hardness is measured in ppm (gms/m<sup>3</sup>) Calcium Carbonate (CaCO<sub>3</sub>) and for general analysis soft water is <60ppm CaCO<sub>3</sub>, medium water <120ppm CaCO<sub>3</sub>, hard water <300ppm CaCO<sub>3</sub> and very hard water > 300 ppm CaCO<sub>3</sub>.

## SOFTENER SIZING

Softeners are rated by their exchange capacity, which is the quantity of Calcium that is removable between regenerations and is determined by the resin performance and specified in gms CaCO<sub>3</sub>. Equipment sizing is then computed on the basis of the raw water hardness and the required brine regeneration period, 24hrs generally being the minimum. An example for sizing an SF600 unit is as follows:-

**Exchange Capacity:** If resin capacity is 75gms CaCO<sub>3</sub>/litre\* and resin volume 350litres = 75x350 = 26,250gms CaCO<sub>3</sub>

**Softening Capacity:** Assume water hardness = 300ppm CaCO<sub>3</sub> = 26,250/300 = 87.5m<sup>3</sup>

**Flow Rate:** Assuming a 20hr operating period/day required flow rate = 87.5/20 = 4.4m<sup>3</sup>/hr, therefore SF 600 is suitable

Note that softening performance is reduced by increased TDS levels and it is necessary to compute compensated hardness when TDS levels are greater than 400ppm as follows:-

$$\text{Compensated Hardness (ppm CaCO}_3\text{)} = \frac{\text{Measured Hardness (ppm CaCO}_3\text{)} \times 9,000}{9,000 - \text{TDS level (ppm)}}$$

## OPERATING CONDITIONS

**Raw Water Appearance:** Clear      **Iron:** <0.1ppm      **Residual Chlorine:** <1ppm      **Bacteria:** Free  
**Temperature Range:** 5°C-40°C      **Min Inlet Pressure:** 1.7 Bar      **Max Operating Pressure:** 3 Bar

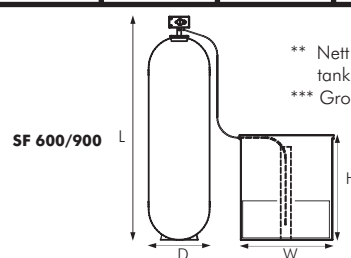
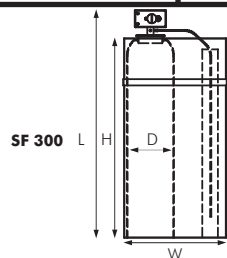
## PERFORMANCE DATA

Model	Resin Volume (l)	Exchange Capacity* (gms CaCO <sub>3</sub> )	Indicative Softening Capacity (m <sup>3</sup> )			Max. Flow (m <sup>3</sup> /hr)	Brine Tank Capacity (l)
			100 ppm	200 ppm	300 ppm		
SF 300	50	3,750	40	20	13	1	300
SF 600	350	26,250	260	130	90	6	600
SF 900	750	56,250	560	280	190	15	1,200

\*Based upon Dowex HCR-S/S resin with capacity of 75gms CaCO<sub>3</sub>/litre: capacity should be adjusted according to performance of resin used.

## SPECIFICATIONS AND DIMENSIONS

Model	Softener Vessel	Valve Type	Pipe Size	L (mm)	D (mm)	H (mm)	W (mm)	Weight (kgs)	
								Nett**	Gross***
SF 300	CXD 300	Autotrol Logix 255	1"	1450	300	1270	650	50	600
SF 600	CXD 600	Autotrol Logix 278	1.5"	2200	620	1000	900	100	1,600
SF 900	CXD 900	Autotrol Magnum	2"	2400	925	1200	1210	170	2,200



\*\* Nett weight of empty vessel, control valve and brine tank only  
 \*\*\* Gross weight includes resin, brine and water

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