Water Softener
PRODUCT DATA SHEET

Product Description

Eagle® Soft is a high purity premium grade bead form conventional gel polystyrene sulphonate cation exchange resin designed expressly for the treatment of foodstuffs, beverages, potable water, and water used in the processing of food. Its specification is such that it will exceed the relevant EEC requirements and the resin is in compliance with the U.S. Food and Drug Administration (FDA) Code of Federal regulations section 21, paragraph 173.25; for use in the treatment of foods for human consumption. Its high bead integrity, excellent chemical and physical stability along with its very low extractible content play a large part in its successful employment in these areas.

Typical Physical and Chemical Characteristics	
Polymer Matrix Structure	Cross-linked Polystyrene Divinylbenzene
Physical Form and Appearance	Clear Spherical Beads
Whole Bead Count	90% min.
Functional Groups	$R\text{-}SO_3^-$
Ionic Form, as shipped	Na+
Shipping Weight (approx.)	850 g/l (53 lb/ft³)
Screen Size Range:	16 - 50 mesh, wet
Particle Size Range	+1.2 mm <5%, -0.3 mm <1%
Moisture Retention, Na+ form	46 - 50%
Swelling Na+ ➔ H+ Ca++ ➔ Na+	5% max 8% max
Specific Gravity, moist Na+ form	1.27
Total Exchange Capacity, Na+ form wet, volumetric dry, weight	 1.9 eq/l min. 4.5 eq/kg min.
Operating Temperature, Na+ form	150°C (300°F) max.
pH Range, Stability, Na+ form	0 - 14
pH Range, operating, Na+ form	6 – 10

Typical Physical and Chemical Characteristics				
Operation	**Rate**	**Solution**	**Minutes**	**Amount**
Service	1.0 -5.0 gpm/ft³	Influent Water	Per design	Per design
Backwash	Refer to Fig. 2	Influent Water	5 - 20	10 – 20 gal/ft³
Regeneration	0.25 – 0.90 gpm/ft³	8 – 20% NaCl	15 - 60	4-10 lb/ft³
Rinse, (slow)	0.25 – 0.90 gpm/ft³	Influent Water	30 approx.	15-30 gal/ft³
Rinse, (fast)	1.0 -5.0 gpm/ft³	Influent Water	30 approx.	24-45 gal/ft³

Operating Performance

The operating performance of Eagle® Soft in the sodium cycle depends on:

a) The amount and concentration of regenerant used.
b) The total hardness of the water to be treated and its sodium content.
c) The flow rate of the influent water through the resin bed.

Performance is usually assessed in terms of the residual hardness in the treated water. Hardness leakage under the standard operating conditions is normally less than 1% of the total hardness of the influent water. The operating capacities are not significantly affected unless the raw water contains more than about 25% of its exchangeable cations as sodium (or other univalent) ions.

Both the operating capacity and the average leakage of hardness during the run may be calculated for a wide range of conditions from the data given in Figs. 3 through 6.

Hydraulic Characteristics

The pressure drop (headloss) across a properly classified bed of ion-exchange resin depends on the particle size distribution, bed depth, and void volume of the exchanger; and on the flow rate and viscosity (and hence the temperature) of the influent solution. Anything affecting any of these parameters will have an adverse effect and result in an increased headloss.

Fig. 1 PRESSURE DROP CHARACTERISTICS

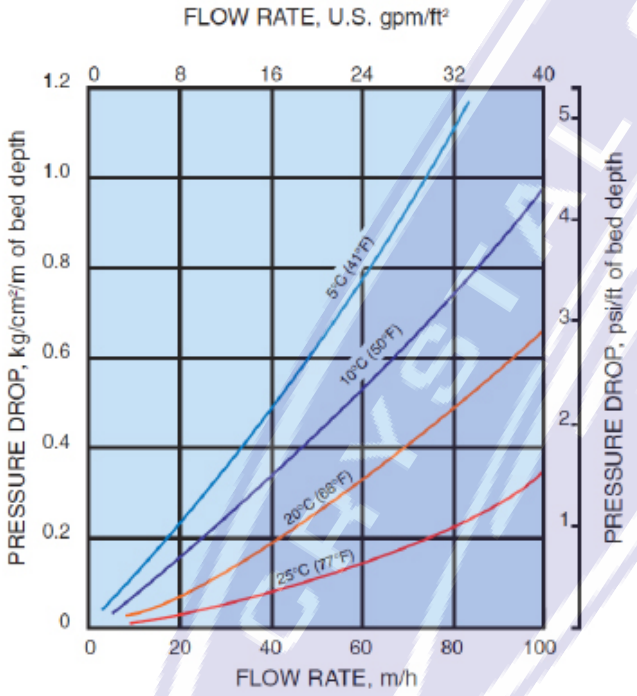
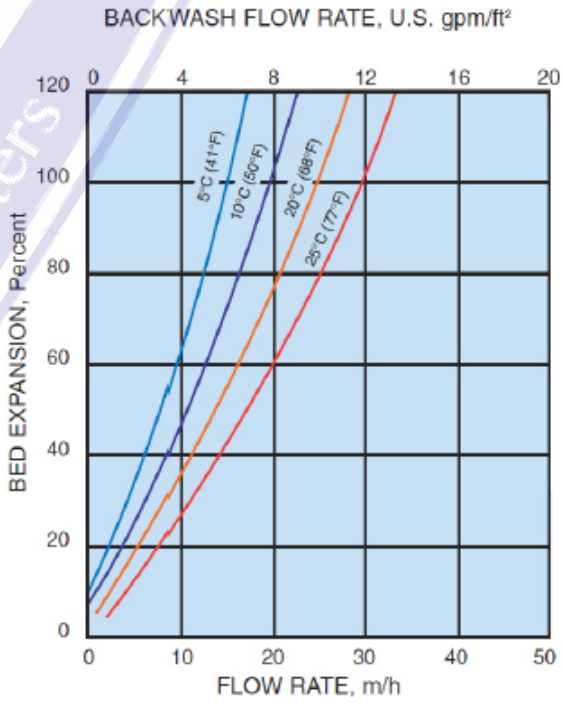


Fig.2 BACKWASH EXPANSION



During up-flow backwash, the resin bed should be expanded in volume by between 50% and 75% in order to free it from any particulate matter from the influent solution, to clear the bed from bubbles and voids, and to reclassify the resin particles as much as possible. This ensures minimum resistance to flow. Backwash should be commenced gradually to avoid an initial surge with consequent carryover of resin particles. Bed expansion increases with flow rate and decreases with temperature (Fig. 2). Care should always be taken to avoid resin loss by accidental over expansion of the bed.

Fig. 3 OPERATING CAPACITY, C_B

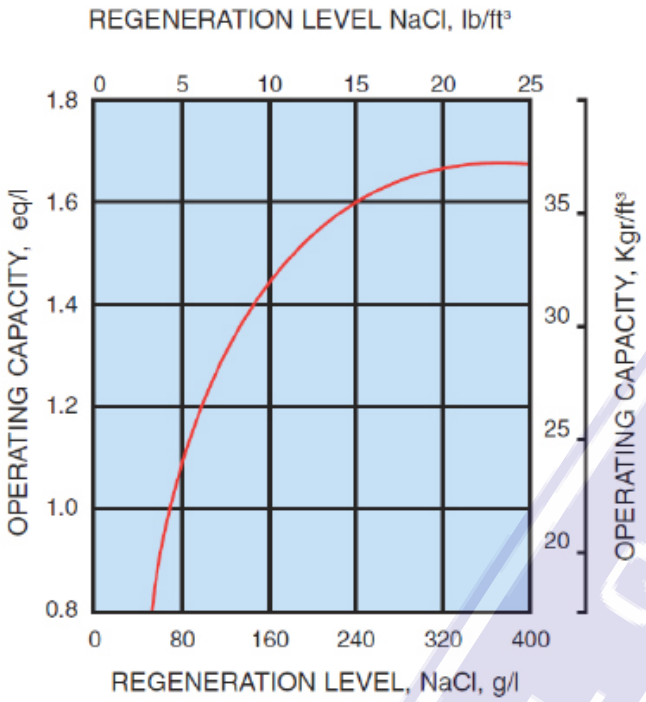


Fig.4 EFFECT OF FLOW RATE & TDS ON OPERATING CAPACITY

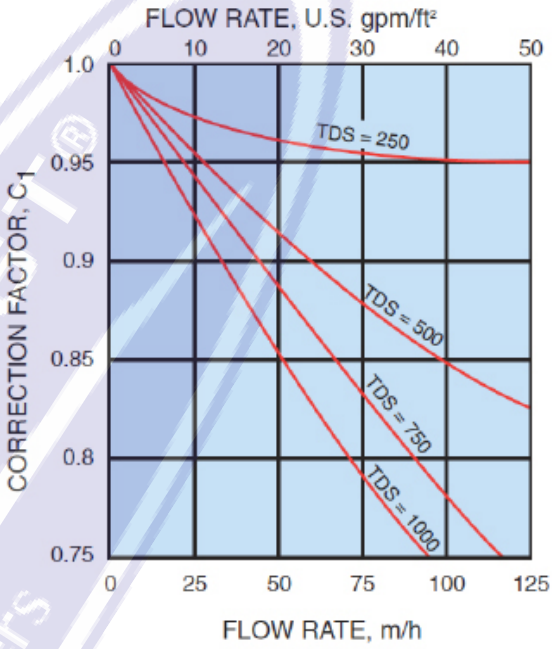


Fig. 5 HARDNESS LEAKAGE

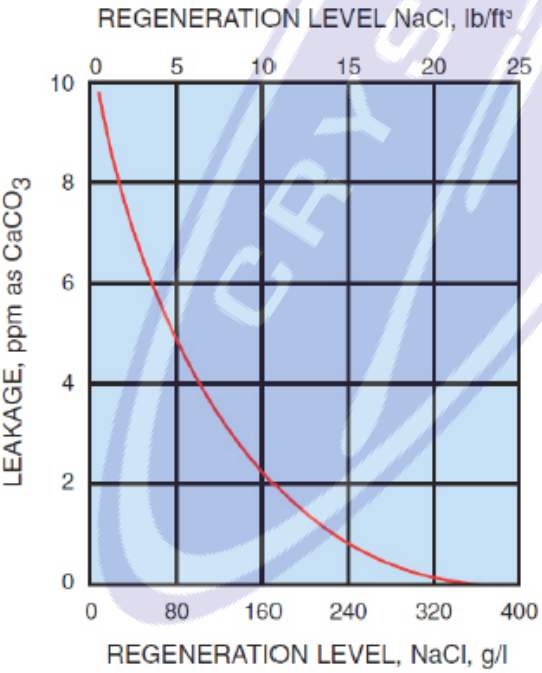


Fig.6 CORRECTION FOR TDS