



AMBERLITE™ FPC3500

Synthetic Cation Exchange Resin

Introduction

AMBERLITE FPC3500 is a synthetic cation exchange resin produced in the form of spherical, white, opaque beads. The unusually high exchange capacity is derived from carboxylic acid groups.

Supplied in the hydrogen or "free-acid" form, AMBERLITE FPC3500 can be converted readily to the sodium form by treatment with a solution of sodium hydroxide. In the sodium form, the resin undergoes reactions typical of the salt of a weak acid and strong base.

Because of its selectivity for the hydrogen ion, any adsorbed cation can be desorbed easily with a regeneration efficiency approaching 100% by treatment with dilute mineral acid.

The carboxylic functionality and exchange selectivities of AMBERLITE FPC3500 lead to immediate consideration of this ion exchange resin in a variety of applications such as the neutralisation of strong bases, the recovery of metallic ions, the isolation and concentration of antibiotics, basic amino acids, enzymes and peptides.

Properties

Physical form	White spherical opaque beads
Ionic form as shipped	H ⁺
Total exchange capacity	≥2.6 meq/ml (H ⁺ form)
Moisture holding capacity	60 to 70% (H ⁺ form)
Harmonic mean size	0.45 - 0.65 mm
Uniformity coefficient	≤2.0
Fines content	<0.300 mm : 8.0% max
Coarse beads	>1.180 mm : 5.0% max
Maximum reversible swelling	H ⁺ -7 Na ⁺ : ~ 110%

Suggested Operating Conditions

Typical pH conditions	2 to 12	
Typical loading flowrate	1 to 2 BV*/h	
Typical operating temperature	20 to 40°C	
Minimum bed depth	750 mm	
Backwash flow rate	5 to 7.5 BV*/h	
Regenerants (100% basis)	HCl	or H ₂ SO ₄
Concentration (%)	2 to 5	0.5 to 0.7
Flow rate (BV/h)	0.25 to 1.0	1.9 to 5.0
Rinse water requirements	4 to 7 BV	
Service flow rate	8 to 16 BV*/h	
Maximum operating temperature	80°C	

Hydraulic Characteristics

The approximate drop in pressure to be expected for each meter of bed depth of AMBERLITE FPC3500 in normal downflow operation at various rates and temperatures is indicated by the data in figure 1.

To ensure proper cleaning and hydraulic classification of AMBERLITE FPC3500 after each operational cycle, the bed of resin should be backwashed with water for about 10 minutes at a flow rate sufficient to effect a minimum of 50% expansion in bed volume.

The hydraulic expansion of the bed during backwashing operations is reported as a function of the flow rate at various temperatures in the following figures. Values for the hydrogen and sodium forms are used in the example.

Figure 1: Pressure drop

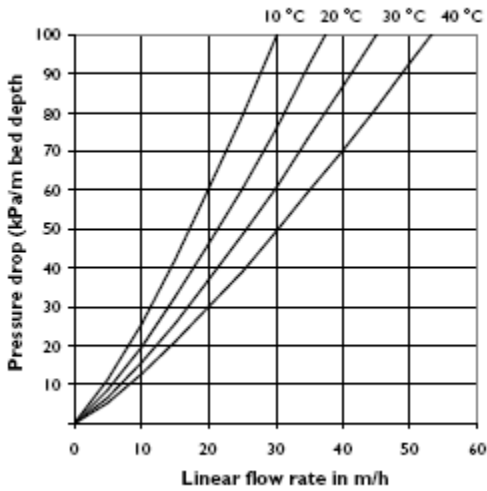


Figure 2: Bed Expansion (Na⁺ form)

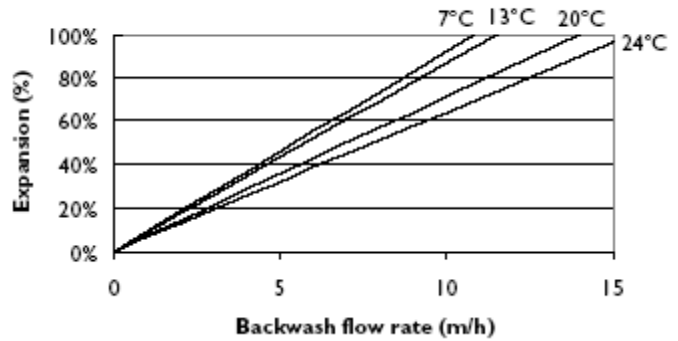
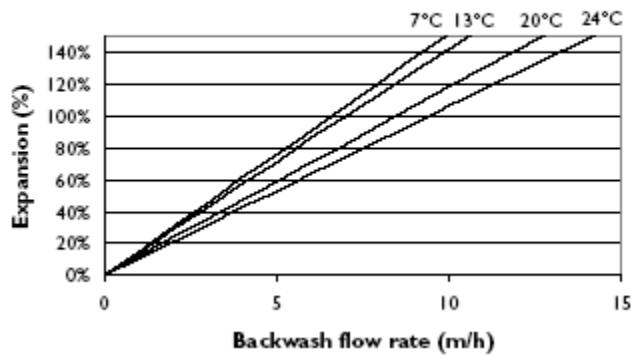


Figure 3: Bed Expansion (H⁺ form)



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