

**AmberLite™ FPA77 UPS Ion Exchange Resin**

High Operating Capacity, Uniform Particle Size, Macroporous, Weak Base Anion Resin for Sweetener Applications

Description

AmberLite™ FPA77 UPS Ion Exchange Resin is a high operating capacity, uniform particle size, macroporous, weak base anion resin for use in deashing sweeteners to produce low-conductivity syrups.

Premium-grade AmberLite™ FPA/FPC UPS Resins help decrease operating costs, and help improve plant capacity. These premium resins extend syrup run times up to 25%, reducing downtime and the chemicals spent on regeneration. A simple change to premium AmberLite™ FPA/FPC UPS resins can postpone or eliminate the need for capital expansion. The uniformity of the beads also reduces sweetwater production and rinse requirements after regeneration, possibly reducing wastewater treatment costs.

In addition to the advantages of its uniform particle size and macroporous matrix, the special formulation of AmberLite™ FPA77 UPS provides the highest operating capacity and, therefore, the lowest processing cost available.

The macroporous matrix also provides excellent mechanical strength.

Applications

- Corn and starch sweetener deashing

Typical Properties

Physical Properties	
Copolymer	Styrene-divinylbenzene
Matrix	Macroporous
Type	Weak base anion
Functional Group	Tertiary amine
Physical Form	White to yellow, opaque, spherical beads
Chemical Properties	
Ionic Form as Shipped	Free base (FB)
Total Exchange Capacity	≥ 1.7 eq/L
Weak Base Capacity	≥ 1.5 eq/L
Water Retention Capacity	40 – 50%
Particle Size §	
Particle Diameter	538 ± 62 µm
400 – 720 µm	≥ 95%
Stability	
Whole Uncracked Beads	≥ 95%
Swelling	FB → HCl : 25%
Density	
Particle Density	1.04 g/mL
Shipping Weight	640 g/L

§ For additional particle size information, please refer to the [Particle Size Distribution Cross Reference Chart](#) (Form No. 45-D00954-en).

Suggested Operating Conditions

Maximum Operating Temperature (OH ⁻ form)	60°C (140°F)		
pH Range	0 – 7		
Bed Depth, min.	910 mm (3.0 ft)		
Flowrates			
Service	2 – 4 BV*/h		
Backwash	See Figure 1		
Fast Rinse (if applicable)	2 – 10 BV/h		
Contact Time			
Regeneration	≥ 30 – 45 minutes		
Displacement Rinse	≥ 30 – 45 minutes		
Total Rinse Requirement	3 – 5 BV		
Regenerant	NaOH [†]	Na ₂ CO ₃	NH ₄ OH
Concentration	4%	5%	5%
Level, 100% basis [‡]	64 – 80 kg/m ³ (4 – 5 lb/ft ³)	96 – 112 kg/m ³ (6 – 7 lb/ft ³)	64 – 80 kg/m ³ (4 – 5 lb/ft ³)
Temperature, max.	60°C (140°F)	60°C (140°F)	60°C (140°F)

* 1 BV (Bed Volume) = 1 m³ solution per m³ resin or 7.5 gal per ft³ resin

[†] NaOH is recommended.

[‡] Regeneration level may be lower for counter-current regeneration systems.

Hydraulic Characteristics

Bed expansion of AmberLite™ FPA77 UPS Ion Exchange Resins as a function of backwash flowrate at 25°C (77°F) is shown in Figure 1. The flowrate necessary to achieve a desired bed expansion for other water temperatures can be calculated with the provided equations.

Pressure drop data for AmberLite™ FPA77 UPS as a function of service flowrate and viscosity is shown in Figure 2. These pressure drop expectations are valid at the start of the service run with clean feed.

Figure 1: Backwash Expansion

Temperature = 25°C (77°F)

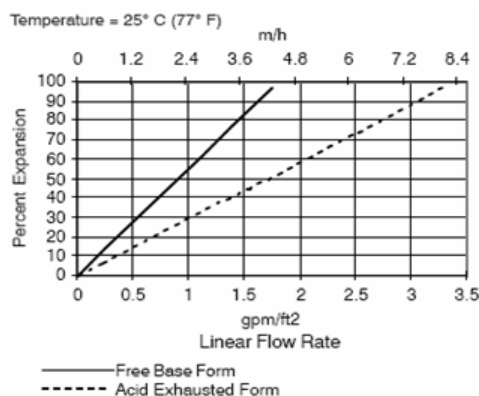
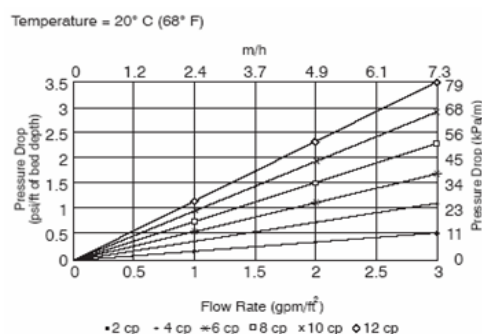


Figure 2: Pressure Drop

Viscosity = 2 – 12 cP



For other temperatures use:

$$F_T = F_{25^\circ\text{C}} [1 + 0.008 (1.8T_{\text{C}} - 45)], \text{ where } F \equiv \text{m/h}$$

$$F_T = F_{77^\circ\text{F}} [1 + 0.008 (T_{\text{F}} - 77)], \text{ where } F \equiv \text{gpm/ft}^2$$

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Please be aware of the following:

- **WARNING:** Oxidizing agents such as nitric acid attack organic ion exchange resins under certain conditions. This could lead to anything from slight resin degradation to a violent exothermic reaction (explosion). Before using strong oxidizing agents, consult sources knowledgeable in handling such materials.



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