Product Data Sheet

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).

Form No. 45-D00710-en, Rev. 0
November 2019

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_2CO_3	NH_4OH
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 m^3 solution per m^3 resin or 7.5 gal per ft^3 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)

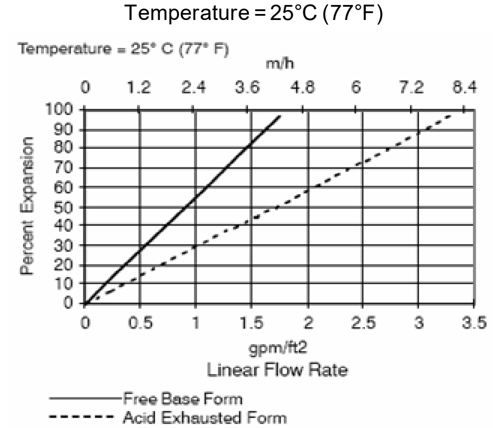
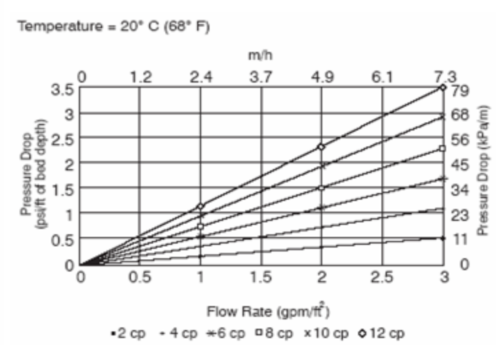


Figure 2: Pressure Drop

Viscosity = 2 – 12 cP



For other temperatures use:

$F_T = F_{25°C} [1 + 0.008 (1.8T_{°C} - 45)]$, where F ≡ m/h

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

Product Stewardship

DuPont has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with DuPont products—from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Customer Notice

DuPont strongly encourages its customers to review both their manufacturing processes and their applications of DuPont products from the standpoint of human health and environmental quality to ensure that DuPont products are not used in ways for which they are not intended or tested. DuPont personnel are available to answer your questions and to provide reasonable technical support. DuPont product literature, including safety data sheets, should be consulted prior to use of DuPont products. Current safety data sheets are available from DuPont.

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.

All information set forth herein is for informational purposes only. This information is general information and may differ from that based on actual conditions. Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other government enactments. The product shown in this literature may not be available for sale and/or available in all geographies where DuPont is represented. The claims made may not have been approved for use in all countries. Please note that physical properties may vary depending on certain conditions and while operating conditions stated in this document are intended to lengthen product lifespan and/or improve product performance, it will ultimately depend on actual circumstances and is in no event a guarantee of achieving any specific results. DuPont assumes no obligation or liability for the information in this document. References to "DuPont" or the "Company" mean the DuPont legal entity selling the products to Customer unless otherwise expressly noted. NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED. No freedom from infringement of any patent or trademark owned by DuPont or others is to be inferred.

Form No. 45-D00710-en, Rev. 0
November 2019