Product Data Sheet

AMBERLITE™ FPA51 Ion Exchange Resin

Food-grade, Macroporous, Weak Base Anion Exchange Resin

Description

AMBERLITE™ FPA51 Ion Exchange Resin is a macroporous, weakly basic, anion exchange resin containing tertiary amine functionality on a crosslinked polystyrene matrix. It has been specifically designed for the purifying liquid food streams including starch-based sweeteners and can also be used in bioprocessing applications.

Nutrition Applications

AMBERLITE™ FPA51 Ion Exchange Resin has been sized to be used both in the fixed bed system commonly used in the corn sweetener industry as well as moving bed systems and polishing mixed bed. It is suitable for the deashing, deacidification, and decolorization of glucose, fructose and related starch-based sweeteners and derivatives as well as gelatin and other food process streams such as fruit juices.

Its high level of porosity gives AMBERLITE™ FPA51 an excellent combination of physical stability and high operating efficiency resulting in long process cycle times compared to products having a higher static volume capacity. This porous network also provides a more complete adsorption and desorption of large organic molecules resulting in excellent color removal compared to other weak base anion exchange resins.

Bioprocessing Applications

A number of different antibiotic classes have been isolated, chemically modified, and used extensively by physicians in treating infectious diseases. As most traditional antibiotics were derived from yeast or bacteria, their large-scale production is based on fermentation processes. AMBERLITE™ FPA51 Ion Exchange Resin can be used for the removal of organic color bodies in those downstream bioprocesses.

Applications

- Nutrition applications
  - Sweetener deashing
  - Sweetener deacidification
  - Sweetener decolorization
- Bioprocessing applications
  - Decolorization

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Typical Properties

Physical Properties	
Copolymer	Styrene-divinylbenzene
Matrix	Macroporous
Type	Weak base anion
Functional Group	Secondary amine (≥ 85%)
Physical Form	Beige, opaque, spherical beads
Chemical Properties	
Ionic Form as Shipped	Free base (FB)
Total Exchange Capacity	≥ 1.3 eq/L
Water Retention Capacity	56 – 62%
Particle Size §	
Particle Diameter	490 – 690 µm
< 300 µm	≤ 1.0%
> 1180 µm	≤ 2.0%
Stability	
Swelling	FB → HCl : 25%
Density	
Shipping Weight	660 g/L

§ For additional particle size information, please refer to the Particle Size Distribution Cross Reference Chart (Form No. 177-01775).

Suggested Operating Conditions

Maximum Operating Temperature	100°C (212°F)
Bed Depth, min.	700 mm (2.3 ft)
Flowrates	
Service	2 – 6 BV*/h (depending on syrup concentration)
Backwash	See Figure 1
Regeneration	1 – 2 BV/h
Slow Rinse	Regeneration flowrate for 2 BV
Fast Rinse (if applicable)	Service flowrate for 5 – 10 BV (with condensate or softened water)
Contact Time	
Regeneration	≥ 30 – 45 minutes
Regenerant	NaOH
Concentration	4%
Level	60 kg/m^3 (3.8 lb/ft^3)

* 1 BV (Bed Volume) = 1 m^3 solution per m^3 resin or 7.5 gal per ft^3 resin

Hydraulic Characteristics

Estimated bed expansion of AMBERLITE™ FPA51 Ion Exchange Resin as a function of backwash flowrate and temperature is shown in Figure 1.

Estimated pressure drop for AMBERLITE™ FPA51 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 and a well-classified bed.

Figure 1: Backwash Expansion

Temperature = 5 – 60°C (41 – 140°F)

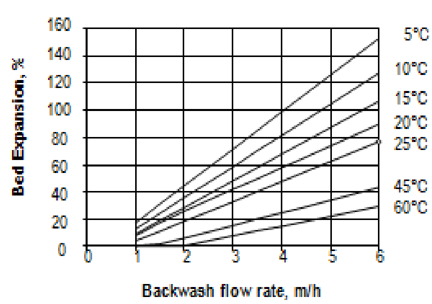
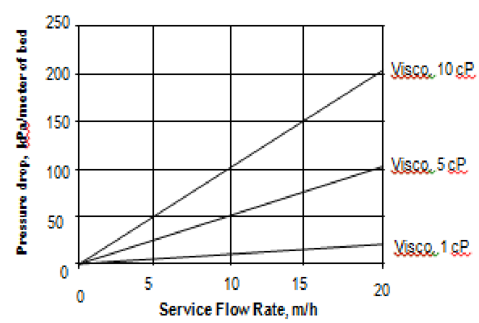


Figure 2: Pressure Drop

Viscosity = 1 – 10 cP



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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.

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