



## Product Data Sheet

### AmberLite™ FPA66 UPS Ion Exchange Resin

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

#### Description

AmberLite™ FPA66 UPS Ion Exchange Resin is a uniform particle size, macroporous, weak base anion resin for use in deashing sweeteners to produce low-conductivity syrups, removing citric and other acids from juice, or deashing/demineralizing fruit juices, other beverages, and food additives. The macroporous matrix provides excellent mechanical strength and high operating capacity.

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.

#### Applications

- Corn and starch sweetener deashing
- Juice deacidification
- Whey, gelatin, and glycerin deashing and decolorizing

#### Typical Properties

|                            |                                          |
|----------------------------|------------------------------------------|
| <b>Physical Properties</b> |                                          |
| Copolymer                  | Styrene-divinylbenzene                   |
| Matrix                     | Macroporous                              |
| Type                       | Weak base anion                          |
| Functional Group           | Tertiary amine                           |
| Physical Form              | White to yellow, opaque, spherical beads |
| <b>Chemical Properties</b> |                                          |
| Ionic Form as Shipped      | Free base (FB)                           |
| Total Exchange Capacity    | ≥ 1.6 eq/L                               |
| Weak Base Capacity         | ≥ 1.35 eq/L                              |
| Water Retention Capacity   | 40 – 50%                                 |
| <b>Particle Size</b> §     |                                          |
| Particle Diameter          | 550 ± 50 µm                              |
| 400 – 720 µm               | ≥ 95%                                    |
| <b>Stability</b>           |                                          |
| Swelling                   | FB → HCl: 20%                            |
| <b>Density</b>             |                                          |
| 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 <sup>-</sup> 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 <sup>†</sup>                                        | Na <sub>2</sub> CO <sub>3</sub>                           | NH <sub>4</sub> OH                                       |
| Concentration                                        | 4%                                                       | 5%                                                        | 5%                                                       |
| Level, 100% basis <sup>‡</sup>                       | 64 – 80 kg/m <sup>3</sup><br>(4 – 5 lb/ft <sup>3</sup> ) | 96 – 112 kg/m <sup>3</sup><br>(6 – 7 lb/ft <sup>3</sup> ) | 64 – 80 kg/m <sup>3</sup><br>(4 – 5 lb/ft <sup>3</sup> ) |
| Temperature, max.                                    | 60°C (140°F)                                             | 60°C (140°F)                                              | 60°C (140°F)                                             |

\* 1 BV (Bed Volume) = 1 m<sup>3</sup> solution per m<sup>3</sup> resin or 7.5 gal per ft<sup>3</sup> resin

<sup>†</sup> NaOH is recommended.

<sup>‡</sup> Regeneration level may be lower for counter-current regeneration systems.

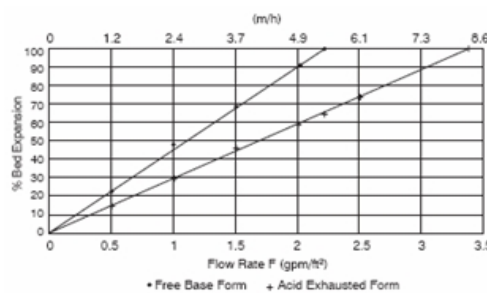
## Hydraulic Characteristics

Bed expansion of AmberLite™ FPA66 UPS Ion Exchange Resin 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™ FPA66 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.

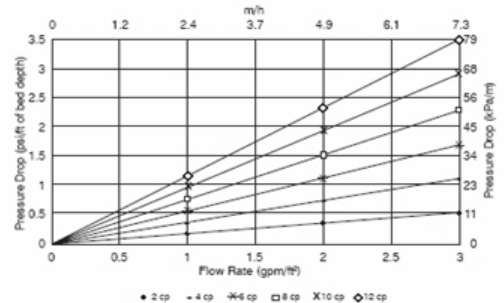
**Figure 1: Backwash Expansion**

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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