



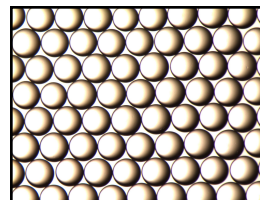
## Product Data Sheet

### **AmberLite™ CR99 K/350 Chromatographic Separation Resin**

Separation Resin Primarily Used for the Purification of Sugar from Beet Molasses

#### **Description**

AmberLite™ CR99 Chromatographic Separation Resins are strong acid cation resins manufactured in a process that produces an extremely uniform particle size. This family of resins was specifically developed for use in simulated moving bed (SMB) chromatographic systems for the recovery and purification of sweeteners.



#### **AmberLite™ CR99 K/350 Chromatographic Separation**

**Resin** was developed for the recovery and purification of beet sugar for use in SMB chromatographic systems that are limited due to pressure drop. It is specifically designed with a good combination of particle size and rapid kinetics for excellent separator performance and has been used for decades for beet molasses desugarization.

#### **Applications**

- Beet molasses desugarization

## Typical Properties

### Physical Properties

|                  |                                     |
|------------------|-------------------------------------|
| Copolymer        | Styrene-divinylbenzene              |
| Matrix           | Gel                                 |
| Type             | Strong acid cation                  |
| Functional Group | Sulfonic acid                       |
| Physical Form    | Amber, translucent, spherical beads |

### Chemical Properties

|                          |                                  |
|--------------------------|----------------------------------|
| Ionic Form as Shipped    | <b>K<sup>+</sup></b>             |
| Total Exchange Capacity  | ≥ 1.4 eq/L (H <sup>+</sup> form) |
| Water Retention Capacity | 59 – 63% (H <sup>+</sup> form)   |

### Stability

|                       |       |
|-----------------------|-------|
| Whole Uncracked Beads | ≥ 98% |
|-----------------------|-------|

### Density

|                  |           |
|------------------|-----------|
| Particle Density | 1.28 g/mL |
| Shipping Weight  | 833 g/L   |

## Typical Bead Size Distribution § (Light Obscuration Instrument Particle Size)

|                   | <b>K<sup>+</sup></b> |       |
|-------------------|----------------------|-------|
| Particle Diameter | 355 ± 15 µm          |       |
| Broad Range       | 320 – 385 µm         | ≥ 90% |
| Narrow Range      | 340 – 375 µm         | ≥ 75% |
| Fine Beads        | < 312 µm             | ≤ 4%  |
| Coarse Beads      | > 413 µm             | ≤ 4%  |

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

## Suggested Operating Conditions

|                                | <b>Beet Molasses (K<sup>+</sup> form)</b> |
|--------------------------------|---|
| Syrup Temperature              | 80 – 85°C (176 – 185°F)                   |
| Syrup pH                       | 7 – 12                                    |
| Dissolved Oxygen Concentration |   |
| Recommended                    | < 0.1 ppm                                 |
| Maximum                        | 0.25 ppm                                  |
| Simulated Moving Bed Operation | With optimized tuning (annually)          |

**It is strongly advised to remove oxygen from feed streams and elution water going into the chromatographic separation resin. Limiting the oxygen concentration to less than 0.1 ppm (0.25 ppm maximum) will help maximize resin life.**

# Hydraulic Characteristics

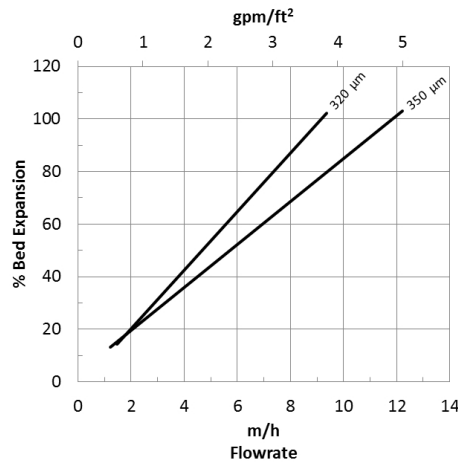
Estimated bed expansion of the 350- $\mu\text{m}$  size of AmberLite™ CR99 Chromatographic Separation Resin as a function of backwash flowrate at 25°C (77°F) is shown in Figure 1. Data for DuPont's 320- $\mu\text{m}$  chromatographic separation resin is also provided for comparison. The flowrate necessary to achieve a desired bed expansion for other water temperatures can be calculated with the provided equations.

Estimated pressure drop data for the 350- $\mu\text{m}$  size of AmberLite™ CR99 as a function of service flowrate and concentration of 42% HFCS (50% D.S. and 30% D.S.) is shown in Figure 2. Data for DuPont's 320- $\mu\text{m}$  chromatographic separation resin is also provided for comparison.

Thermal expansion of the 350- $\mu\text{m}$  size of AmberLite™ CR99 in the K<sup>+</sup> ionic form as a function of temperature is shown in Figure 3.

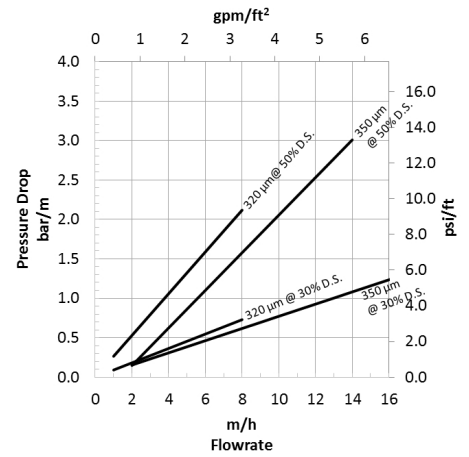
**Figure 1: Backwash Expansion**

Temperature = 25°C (77°F)



**Figure 2: Pressure Drop**

Syrup (42% HFCS) Concentration = 30% D.S., 50% D.S.

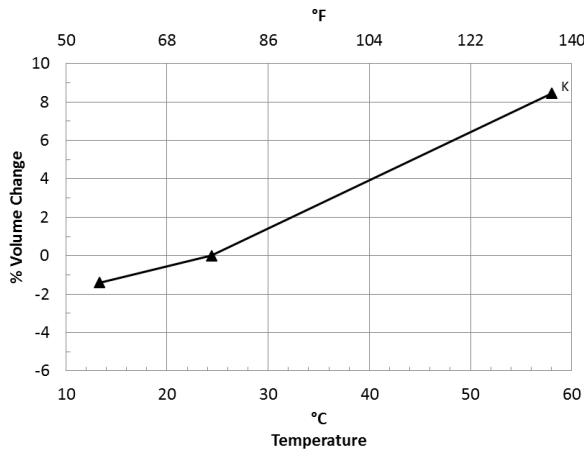


For other temperatures use:

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

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

**Figure 3: Thermal Expansion**



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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.

## Regulatory Note

This product may be used in applications that need to comply with relevant regulations. In support of these applications, a Regulatory Information Package is available upon request. Please address your request to your sales team or the contact details provided in this Product Data Sheet.

Have a question? Contact us at:

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