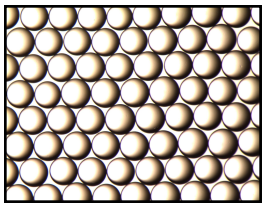
Product Data Sheet

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

Form No. 45-D00714-en, Rev. 2
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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	**K^+**
Total Exchange Capacity	≥ 1.4 eq/L (H^+ form)
Water Retention Capacity	59 – 63% (H^+ 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)

	K^+	
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

	Beet Molasses (K^+ form)
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-µm 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-µm 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-µm 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-µm chromatographic separation resin is also provided for comparison.

Thermal expansion of the 350-µm size of AmberLite™ CR99 in the K^+ ionic form as a function of temperature is shown in Figure 3.

Figure 1: Backwash Expansion

Temperature = 25°C (77°F)

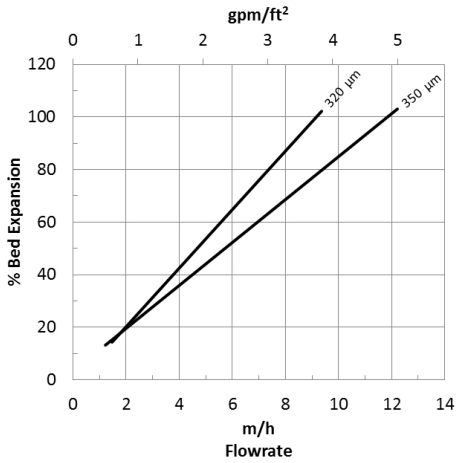
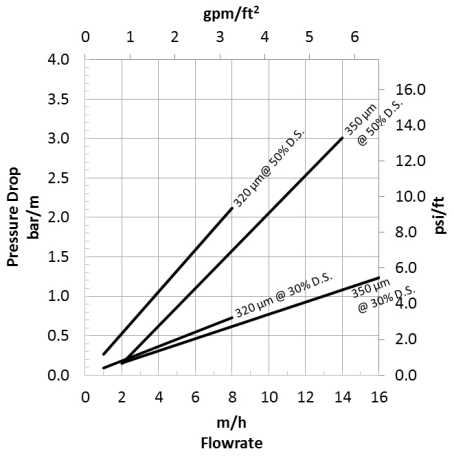


Figure 2: Pressure Drop

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

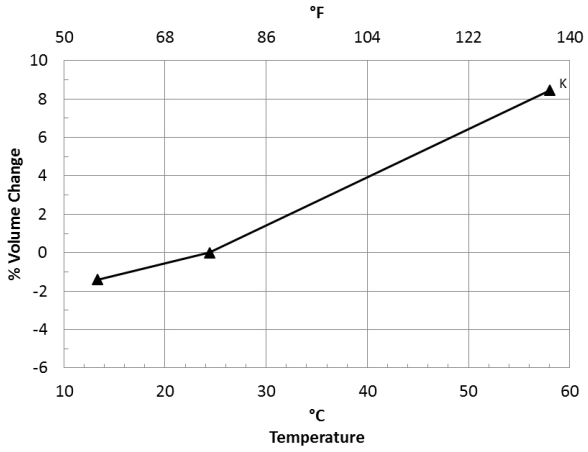


For other temperatures use:

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

$F_T = F_{77°F} [1 + 0.008 (T_{°F} - 77)]$, where F ≡ gpm/ft²

Figure 3: Thermal Expansion



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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.

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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.

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:

www.dupont.com/water/contact-us

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