



Product Data Sheet

AmberSep™ 21K Ion Exchange Resins

Industrial-grade, Strong Base Anion Exchange Resins for Mineral Processing Applications

Description

AmberSep™ 21K Ion Exchange Resins are Type I strong base anion resins with excellent kinetics and regeneration efficiency, along with outstanding physical stability. Both are especially suited for mineral processing and groundwater remediation applications due to their enhanced-porosity gel bead matrix made by a special process giving fast equilibrium rates and improved resistance to organics.

AmberSep™ 21K XLT Ion Exchange Resin, with its high capacity and uniform particle size, represents the state-of-the-art solution for mineral processing, giving enhanced performance for packed bed systems.

AmberSep™ 21K 16-20 Ion Exchange Resin, with its screened particle size from 16 – 20 U.S. Mesh, is a high-efficiency, large-bead resin suitable for fluidized-bed and Resin-In-Pulp (RIP) applications.

Applications

- Mineral Processing (Zn, Mn, etc.)
- Precious metal recovery (Au, Ag, Pt, Pd, Rh)
- Uranium recovery

Typical Properties

Physical Properties		
Copolymer	Styrene-divinylbenzene	
Matrix	Gel	
Type	Strong base anion, Type I	
Functional Group	Quaternary amine	
Physical Form	White to tan, translucent, spherical beads	
Chemical Properties		
	AmberSep™ 21K XLT	AmberSep™ 21K 16-20
Ionic Form as Shipped	Cl ⁻	Cl ⁻
Total Exchange Capacity	≥ 1.4 eq/L	≥ 1.2 eq/L
Water Retention Capacity	50 – 60%	50 – 58%
Particle Size [§]		
Particle Diameter	575 ± 50 µm	800 – 1300 µm
Uniformity Coefficient	≤ 1.1	
< 840 µm		≤ 10%
< 710 µm		≤ 2%
Stability		
Whole Uncracked Beads	≥ 95%	≥ 90%
Swelling	Cl ⁻ → OH ⁻ : 18 – 20%	Cl ⁻ → OH ⁻ : 20%
Density		
Particle Density	1.08 g/mL	1.08 g/mL
Shipping Weight	670 g/L	690 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 ⁻ form	60°C (140°F)	
Cl ⁻ form	100°C (212°F)	
pH Range	0 – 14	
Bed Depth, min.	800 mm (2.6 ft)	
Organic Loading	≤ 3 g KMnO ₄ /L resin	
Flowrates		
	AmberSep™ 21K XLT	AmberSep™ 21K 16-20
Service	5 – 60 m/h (2 – 24 gpm/ft ²)	5 – 50 m/h (2 – 20 gpm/ft ²)
Backwash	See Figure 1	See Figure 1
Regeneration		
Chemical Injection		
Co-current	1 – 10 m/h (0.4 – 4 gpm/ft ²)	1 – 10 m/h (0.4 – 4 gpm/ft ²)
Counter-current	5 – 20 m/h (2 – 8 gpm/ft ²)	
Displacement Rinse		
Co-current	1 – 10 m/h (0.4 – 4 gpm/ft ²)	1 – 10 m/h (0.4 – 4 gpm/ft ²)
Counter-current	5 – 20 m/h (2 – 8 gpm/ft ²)	
Fast Rinse	5 – 60 m/h (2 – 24 gpm/ft ²)	5 – 50 m/h (2 – 20 gpm/ft ²)
Total Rinse Requirement	3 – 6 BV*	3 – 6 BV*
Regenerant	NaCl, Na ₂ CO ₃ , NaOH	
Temperature	Ambient or up to 50°C (122°F) for silica removal	

* 1 BV (Bed Volume) = 1 m³ solution per m³ resin or 7.5 gal per ft³ resin

Hydraulic Characteristics

Bed expansion of AmberSep™ 21K XLT and AmberSep™ 21K 16-20 Ion Exchange Resins as a function of backwash flowrate at 25°C (77°F) is shown in Figure 1.

Pressure drop data for AmberSep™ 21K XLT and AmberSep™ 21K 16-20 as a function of service flowrate at 25°C (77°F) is shown in Figure 2. Pressure drop data are valid at the start of the service run with clean water.

Figure 1: Backwash Expansion
Temperature = 25°C (77°F)

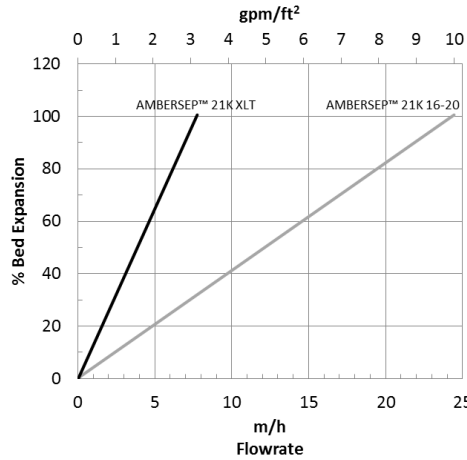
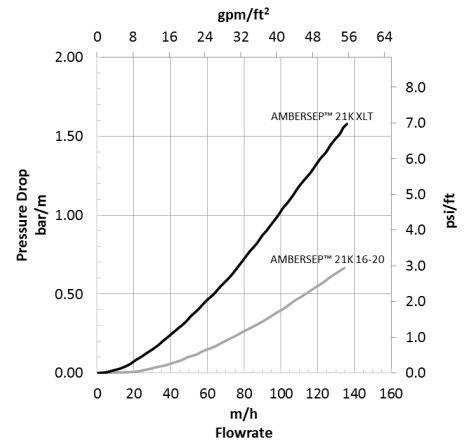


Figure 2: Pressure Drop
Temperature = 25°C (77°F)



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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.

Have a question? Contact us at:

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