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

<table>
<thead>
<tr>
<th>Physical Properties</th>
<th>AMBERSEP™ 21K XLT</th>
<th>AMBERSEP™ 21K 16-20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copolymer</td>
<td>Styrene-divinylbenzene</td>
<td></td>
</tr>
<tr>
<td>Matrix</td>
<td>Gel</td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Strong base anion, Type I</td>
<td></td>
</tr>
<tr>
<td>Functional Group</td>
<td>Quaternary amine</td>
<td></td>
</tr>
<tr>
<td>Physical Form</td>
<td>White to tan, translucent, spherical beads</td>
<td></td>
</tr>
</tbody>
</table>

**Chemical Properties**

<table>
<thead>
<tr>
<th>Ionic Form as Shipped</th>
<th>Cl&lt;sup&gt;-&lt;/sup&gt;</th>
<th>Cl&lt;sup&gt;-&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Exchange Capacity</td>
<td>≥ 1.4 eq/L</td>
<td>≥ 1.2 eq/L</td>
</tr>
<tr>
<td>Water Retention Capacity</td>
<td>50 – 60%</td>
<td>50 – 58%</td>
</tr>
</tbody>
</table>

**Particle Size**

- **Particle Diameter**: 575 ± 50 µm (800 – 1300 µm)
- **Uniformity Coefficient**: ≤ 1.1

**Stability**

- **Whole Uncracked Beads**: ≥ 95%

**Density**

- **Particle Density**: 1.08 g/mL
- **Shipping Weight**: 670 g/L (690 g/L)

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### Suggested Operating Conditions

**Maximum Operating Temperature**

- **OH<sup>-</sup> form**: 60°C (140°F)
- **Cl<sup>-</sup> form**: 100°C (212°F)

**pH Range**: 0 – 14

**Bed Depth, min.**: 800 mm (2.6 ft)

**Organic Loading**: ≤ 3 g KMnO<sub>4</sub>/L resin

**Flowrates**

- **Service**: 5 – 60 m/h (2 – 24 gpm/ft<sup>2</sup>)
- **Backwash**: See Figure 1
- **Regeneration Chemical Injection**
  - **Co-current**: 1 – 10 m/h (0.4 – 4 gpm/ft<sup>2</sup>)
  - **Counter-current**: 5 – 20 m/h (2 – 8 gpm/ft<sup>2</sup>)
- **Displacement Rinse**
  - **Co-current**: 1 – 10 m/h (0.4 – 4 gpm/ft<sup>2</sup>)
  - **Counter-current**: 5 – 20 m/h (2 – 8 gpm/ft<sup>2</sup>)
- **Fast Rinse**: 5 – 60 m/h (2 – 24 gpm/ft<sup>2</sup>)

**Total Rinse Requirement**: 3 – 6 BV*

**Regenerant**

- **NaCl, Na<sub>2</sub>CO<sub>3</sub>, NaOH**

**Temperature**: Ambient or up to 50°C (122°F) for silica removal

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* 1 BV (Bed Volume) = 1 m<sup>3</sup> solution per m<sup>3</sup> resin or 7.5 gal per ft<sup>2</sup> 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:
www.dupont.com/water/contact-us

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