DOWEX™ MONOSPHERE™ 650HXC NG (H)
A High Cross-linked Uniform Particle Size Strong Acid Cation Exchange Resin for Condensate Polishing Applications

<table>
<thead>
<tr>
<th>Product</th>
<th>Type</th>
<th>Matrix</th>
<th>Functional group</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOWEX™ MONOSPHERE™ 650HXC NG (H)</td>
<td>Strong acid cation</td>
<td>Styrene-DVB, gel</td>
<td>Sulfonic acid</td>
</tr>
</tbody>
</table>

Guaranteed Sales Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>H+ form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total exchange capacity, min.</td>
<td>eq/L</td>
</tr>
<tr>
<td>Water retention capacity</td>
<td>%</td>
</tr>
<tr>
<td>Bead size distribution</td>
<td></td>
</tr>
<tr>
<td>Volume median diameter</td>
<td>μm</td>
</tr>
<tr>
<td>Uniformity coefficient, max.</td>
<td></td>
</tr>
<tr>
<td>&gt; 850 μm, max.</td>
<td>%</td>
</tr>
<tr>
<td>&lt; 300 μm, max.</td>
<td>%</td>
</tr>
<tr>
<td>Whole uncracked beads, min.</td>
<td>%</td>
</tr>
<tr>
<td>Friability (Crush strength)</td>
<td>g/bead</td>
</tr>
<tr>
<td>&gt; 200 g/bead, min.</td>
<td>%</td>
</tr>
<tr>
<td>Ionic conversion, min.</td>
<td>%</td>
</tr>
<tr>
<td>Trace metals, ppm dry resin, max.</td>
<td></td>
</tr>
<tr>
<td>Na</td>
<td>50</td>
</tr>
<tr>
<td>Fe</td>
<td>50</td>
</tr>
<tr>
<td>Cu</td>
<td>50</td>
</tr>
<tr>
<td>Al</td>
<td>50</td>
</tr>
<tr>
<td>Ni</td>
<td>10</td>
</tr>
<tr>
<td>Zn</td>
<td>10</td>
</tr>
<tr>
<td>Heavy Metals (as Pb)</td>
<td>20</td>
</tr>
</tbody>
</table>

Typical Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>H+ form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total swelling (Na+ ⇒ H+)</td>
<td>%</td>
</tr>
<tr>
<td>Particle density</td>
<td>g/mL</td>
</tr>
<tr>
<td>Shipping weight**</td>
<td>g/L</td>
</tr>
<tr>
<td>lbs/ft³</td>
<td>51</td>
</tr>
</tbody>
</table>

Recommended Operating Conditions

- Maximum operating temperature: 130°C (265°F)
- pH range: 0-14
- Bed depth in mixed bed, min.: 450 mm (1.5 ft)
- Flow rates: Service/condensate polishing Backwash Regeneration/displacement rinse
  - 40-150 m/h (16-60 gpm/ft²)
  - See figure 2
- Total rinse requirement
- Regenerant
  - 3-6 Bed volumes
  - 1-10% H₂SO₄ or 4-8% HCl

** As per the backwashed and settled density of the resin, determined by ASTM D-2187.
**Typical properties and applications**

DOWEX™ MONOSPHERE™ 650HXC NG (H) strong acid cation exchange resin is a nuclear grade high capacity gel resin with uniform particle size designed especially for use in non-regenerable deep bed condensate polishers together with DOWEX MONOSPHERE 550A (OH) at boiling water reactor (BWR) power stations. The resin attributes an outstanding stability against oxidative conditions to its higher cross-linkage (14%-DVB) and prevents surface kinetic impairment of anion resins due to smaller amounts of high molecular weight TOC leachables.

**Packaging**

5 cubic feet fiber drums.

**Figure 1. Pressure Drop vs. Flow Rate**

For DOWEX MONOSPHERE 650HXC NG (H), 20°C (68°F)

![Pressure Drop vs. Flow Rate Graph](image)

For other temperatures use:

\[ P_T = \frac{P_{20°C}}{(0.026T°C + 0.48)} \], where \( P = \text{bar/m} \)

**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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