**DOWEX™ MONOSPHERE™ 88**
Ion Exchange Resin for Sweetener Applications

<table>
<thead>
<tr>
<th>Product</th>
<th>Type</th>
<th>Matrix</th>
<th>Functional group</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOWEX™ MONOSPHERE™ 88</td>
<td>Strong acid cation</td>
<td>Styrene-DVB, macroporous</td>
<td>Sulfonate</td>
</tr>
</tbody>
</table>

**Typical Physical and Chemical Properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ionic form as produced</td>
<td>Na⁺</td>
</tr>
<tr>
<td>Total exchange capacity, min.</td>
<td>eq/L</td>
</tr>
<tr>
<td>Water content</td>
<td>%</td>
</tr>
<tr>
<td>Volume median diameter</td>
<td>μm</td>
</tr>
<tr>
<td>Total swelling (Na⁺ → H⁺)</td>
<td>%</td>
</tr>
<tr>
<td>Whole uncracked beads, min.</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></td>
<td>lbs/ft³</td>
</tr>
</tbody>
</table>

**Recommended Operating Conditions**

- Maximum operating temperature (H⁺ form) 93°C (200°F)
- pH range 0 - 14
- Bed depth, min. 91 cm (3 ft)
- Flow rates:
  - Service 2 - 4 bed volumes/hour
  - Backwash See Figure 1
  - Regeneration time 30 - 45 min.
  - Displacement rinse 30 - 45 min.
  - Fast rinse (if applicable) 2 - 10 bed volumes /hour
- Total rinse requirement 2 - 5 bed volumes
- Regenerant:
  - Concentration 7% HCl
  - Level, 100% basis† 5 - 6 lbs/ft³
  - Temperature, max. 93°C (200°F)

† Regeneration level may be lower for counter-current regeneration systems.

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

DOWEX™ MONOSPHERE™ 88 resin is a strong acid cation resin made using a Dow-patented process which produces beads with remarkable size uniformity. Chemically optimized for syrup processing, they provide an ideal balance of high operating capacity, excellent physical strength, economical regeneration, long resin life and low operating costs.

Packaging

25 liter bags, 5 cubic feet fiber drums or 1 cubic meter super sacks.

Figure 1. Backwash Expansion Data

![Graph showing backwash expansion data]

Flow Rate (gpm/ft²) vs. Bed Expansion (%)

For other temperatures use:

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

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

Figure 2. Pressure Drop Data

![Graph showing pressure drop data]

Pressure Drop (psi/ft) vs. Flow Rate (gpm)

For other temperatures use:

\[ P_T = P_{20^\circ C} / (0.026 T_{25} + 0.46), \]  
where \( P \equiv \text{bar/m} \)

\[ P_T = P_{60^\circ F} / (0.014 T_{60} + 0.05), \]  
where \( P \equiv \text{psi/ft} \)

DOWEX™ Ion Exchange Resins

For more information about DOWEX resins, call the Dow Water Solutions business:

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http://www.dowwatersolutions.com

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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