**DOWEX MARATHON C**

A Uniform Particle Size, High Capacity Cation Exchange Resin for Softening and Demineralization Applications

### Product Information

<table>
<thead>
<tr>
<th>Product</th>
<th>Type</th>
<th>Matrix</th>
<th>Functional group</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOWEX* MARATHON* C</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></th>
<th>Na⁺ form</th>
<th>H⁺ form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total exchange capacity, min.</td>
<td>eq/l</td>
<td>2.0</td>
</tr>
<tr>
<td></td>
<td>kgr/ft³ as CaCO₃</td>
<td>43.7</td>
</tr>
<tr>
<td>Water content</td>
<td>%</td>
<td>42 - 48</td>
</tr>
<tr>
<td>Uniformity coefficient, max.</td>
<td></td>
<td>1.1</td>
</tr>
</tbody>
</table>

### Typical Physical and Chemical Properties

<table>
<thead>
<tr>
<th></th>
<th>Na⁺ form</th>
<th>H⁺ form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean particle size†</td>
<td>µm</td>
<td>585 ± 50</td>
</tr>
<tr>
<td>Whole uncracked beads</td>
<td>%</td>
<td>95 - 100</td>
</tr>
<tr>
<td>Total swelling (Na⁺ → H⁺)</td>
<td>%</td>
<td>8</td>
</tr>
<tr>
<td>Particle density</td>
<td>g/ml</td>
<td>1.28</td>
</tr>
<tr>
<td>Shipping weight</td>
<td>g/l</td>
<td>820</td>
</tr>
<tr>
<td></td>
<td>lbs/ft³</td>
<td>51</td>
</tr>
</tbody>
</table>

### Recommended Operating Conditions

- **Maximum operating temperature:** 120°C (250°F)
- **pH range:** 0-14
- **Bed depth, min.:** 800 mm (2.6 ft)
- **Flow rates:**
  - Service/fast rinse: 5-60 m/h (2-24 gpm/ft²)
  - Backwash: See figure 1
  - Co-current regeneration/displacement rinse: 1-10 m/h (0.4-4 gpm/ft²)
  - Counter-current regeneration/displacement rinse: 5-20 m/h (2-8 gpm/ft²)
- **Total rinse requirement:** 2-5 Bed volumes
- **Regenerant:** 1-8% H₂SO₄, 4-8% HCl or 8-12% NaCl

†For additional particle size information, please refer to the Particle Size Distribution Cross Reference Chart (Form No. 177-01775/CH 171-476-E).

*Trademark of The Dow Chemical Company

DOWEX Ion Exchange Resins
**Typical properties and applications:**

DOWEX\textsuperscript{*} MARATHON\textsuperscript{*} C strong acid cation exchange resin is a uniform particle size resin designed for demineralization applications. The small uniform beads exhibit faster kinetics than conventionally sized resins. The improved kinetics results in improved regeneration efficiency, higher operating capacity, reduced regenerant usage and less waste water. DOWEX MARATHON C resin also shows outstanding stability to compressive and osmotic stress.

**Packaging**

25 liter bags or 5 cubic feet fiber drums.

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**Figure 1. Backwash Expansion Data**

Temperature = 25\degree C (77\degree F)  
\[ \text{Temperature} = 25 \degree C (77 \degree F) \]

For other temperatures use:

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

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

**Figure 2. Pressure Drop Data**

Temperature = 20\degree C (68\degree F)  
\[ \text{Temperature} = 20 \degree C (68 \degree F) \]

For other temperatures use:

\[ P_T = P_{20\degree C} / \left( 0.026 T_{\text{°}C} + 0.48 \right), \text{ where } P = \text{bar/m} \]

\[ P_T = P_{68\degree F} / \left( 0.014 T_{\text{°}F} + 0.05 \right), \text{ where } P = \text{psi/ft} \]

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**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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