



## **DOWEX™ MONOSPHERE™ 650C (H) Resin**

A Uniform Particle Size Strong Acid Cation Exchange Resin

For Mixed Bed Demineralization and Condensate Polishing Applications

### **Description**

DOWEX™ MONOSPHERE™ 650C (H) cation exchange resin is a premium quality gel resin with uniform particle size designed specifically for use in mixed beds. It is ideally suited to the high flow rate demands of condensate polishing applications. The bead size uniformity is tailored to complement the smaller, less dense DOWEX MONOSPHERE 550A (OH) Anion Resin. Together, these resins offer near perfect separation in mixed beds.

The color distinction between the two resins allows easy visual confirmation of separation following backwash. DOWEX MONOSPHERE 650C (H) Resin has outstanding mechanical strength and very good stability to oxidation.

### **Typical Physical and Chemical Properties**

|                               |                                                  |                                                                   |
|-------------------------------|--------------------------------------------------|-------------------------------------------------------------------|
| Physical form                 |                                                  | Dark amber translucent spherical beads                            |
| Matrix                        |                                                  | Styrene-DVB gel                                                   |
| Functional group              |                                                  | Sulfonic acid                                                     |
| Ionic form as shipped         |                                                  | H <sup>+</sup> form                                               |
| Total volume capacity, min.   | eq/L<br>kgr/ft <sup>3</sup> as CaCO <sub>3</sub> | 2.0<br>43.7                                                       |
| Moisture retention capacity   | %                                                | 46–51                                                             |
| Particle size                 |                                                  |                                                                   |
| Harmonic mean diameter        | µm                                               | 650 ± 50                                                          |
| Uniformity coefficient, max.  |                                                  | 1.1                                                               |
| > 850 µm, max.                | %                                                | 5                                                                 |
| < 300 µm, max.                | %                                                | 0.5                                                               |
| Whole uncracked beads, min.   | %                                                | 95                                                                |
| Friability                    |                                                  |                                                                   |
| Average, min.                 | g/bead                                           | 500                                                               |
| > 200 g/bead, min.            | %                                                | 95                                                                |
| Ionic conversion, min.        | %                                                | 99.7                                                              |
| Trace metals, dry resin, max. | ppm                                              | Na (100); Fe (50); Cu (50); Al (50);<br>Heavy metals [as Pb] (20) |
| Total swelling                | (Na <sup>+</sup> to H <sup>+</sup> ) %           | 7                                                                 |
| Particle density              | g/mL                                             | 1.22                                                              |
| Shipping density**            | g/L<br>lbs/ft <sup>3</sup>                       | 785<br>49                                                         |

For additional particle size information, please refer to Particle Size Distribution Cross Reference Chart (Form No. 177-01775).

\*\*As per the backwashed and settled density of the resin, determined by ASTM D-2187

## Suggested Operating Conditions

|                                            |                                                  |
|--------------------------------------------|--------------------------------------------------|
| Maximum operating temperature              | 130°C / 265°F                                    |
| pH range                                   | 0–14                                             |
| Bed depth, min.                            | 450 mm (1.5 ft)                                  |
| Flow rates:                                |                                                  |
| Service/fast rinse                         | 5–60 m/h (2–24 gpm/ft <sup>2</sup> )             |
| Service/condensate polishing               | 40–150 m/h (16–60 gpm/ft <sup>2</sup> )          |
| Backwash                                   | See figure 1                                     |
| Co-current regeneration/displacement rinse | 1–10 m/h (0.4–4 gpm/ft <sup>2</sup> )            |
| Total rinse requirement                    | 3–6 BV*                                          |
| Regenerant                                 | 1–10% H <sub>2</sub> SO <sub>4</sub> or 4–8% HCl |

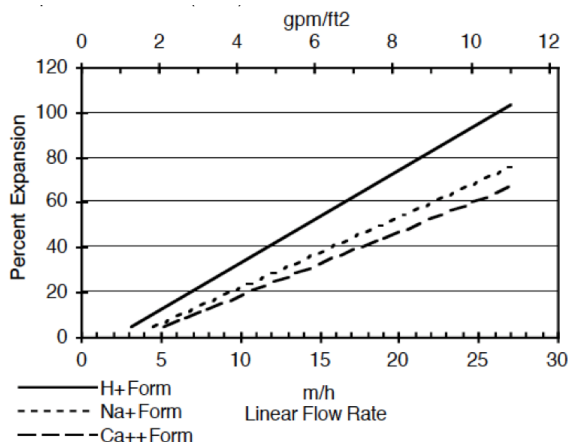
\*1 BV (Bed Volume) = 1 m<sup>3</sup> solution per m<sup>3</sup> resin or 7.5 gals per ft<sup>3</sup> resin

## Hydraulic Characteristics

Figure 1 shows the bed expansion of DOWEX™ MONOSPHERE™ 650C (H) Resin as a function of backwash flow rate and water temperature. Figure 2 shows the pressure drop data for DOWEX MONOSPHERE 650C (H) Resin as a function of service flow rate and water temperature. Pressure drop data are valid at the start of the service run with clear water and a correctly classified bed.

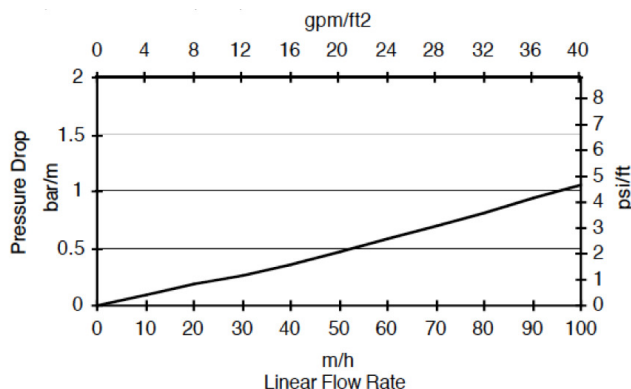
**Figure 1. Backwash Expansion Data**

Temperature = 25°C (77°F)



**Figure 2. Pressure Drop Data**

Temperature = 20°C (68°F)



For other temperatures use:

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

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

For other temperatures use:

$$P_T = P_{20^\circ\text{C}} / (0.026 T_{^\circ\text{C}} + 0.48), \text{ where } P \equiv \text{bar/m}$$

$$P_T = P_{68^\circ\text{F}} / (0.014 T_{^\circ\text{F}} + 0.05), \text{ where } P \equiv \text{psi/ft}$$

## Packaging

25 liter bags or 5 cubic feet fiber drums

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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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