



DOWEX™ MONOSPHERE™ 650C UPW (H)

Uniform Particle Size Strong Acid Cation Resin for Single or Mixed Bed Demineralization for Ultrapure Water Applications

Description

DOWEX™ MONOSPHERE™ 650C UPW (H) is a uniform, high purity, strong acid cation exchange resin recommended for the roughing ion exchange loop either in a 2-bed followed by a mixed bed or in a working mixed bed following reverse osmosis. The dark color of this resin is a visible differentiation from the light colored DOWEX MONOSPHERE 550A anion resin and is therefore suited for regenerable mixed beds. The UPW grade is characterized by its efficient rinse profiles to conductivity and (Δ) TOC end points.

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 ⁺ form
Total volume capacity, min.	eq/L	1.9
	kg/ft ³ as CaCO ₃	41.5
Moisture retention capacity	%	46–51
Particle size		
Harmonic mean diameter	μ m	650 \pm 50
Uniformity coefficient, max.		1.1
Whole uncracked beads, min.	%	95
Friability		
Average, min.	g/bead	500
> 200 g/bead, min.	%	95
Particle density	g/mL	1.22
Shipping density**	g/L	785
	lbs/ft ³	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: Single bed Mixed bed	120°C / 250°F 60°C / 140°F
Resin bed depth, min: Single bed Mixed bed	800 mm (2.6 ft) 450 mm (1.5 ft)
Flow rates: Service/fast rinse Backwash Regeneration/displacement	10–60 m/h (4–24 gpm/ft ²) See Figure 1 4–10 m/h (1.6–4 gpm/ft ²)
Total rinse requirement	2–5 BV*
Regenerant	1–8% H ₂ SO ₄ , 4–8% HCl
UPW Specific Properties	
Rinse characteristics: UPW grade resins are rinsed with +17.5 Megaohm.cm water to meet stringent ionic and organic residuals – Ionic conductivity rinse down, max. (as packaged) – TOC rinse down to 5 ppb (+) (see Figure 3)	1 µS/cm 20 BV

*1 BV (Bed Volume) = 1 m³ solution per m³ resin or 7.5 gals per ft³ resin

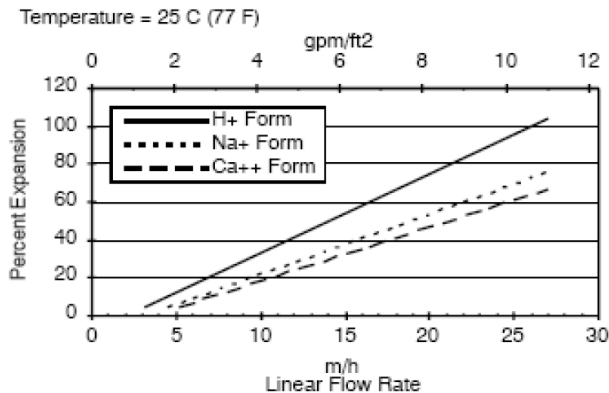
Packaging

5 cubic foot fiber drum

Hydraulic Characteristics

Figure 1 shows the bed expansion of DOWEX™ MONOSPHERE™ 650C UPW (H) as a function of backwash flow rate and water temperature. Figure 2 shows the pressure drop data for DOWEX MONOSPHERE 650C UPW (H) 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 3 shows the conductivity and TOC rinse performance of the resin.

Figure 1. Backwash Expansion Data

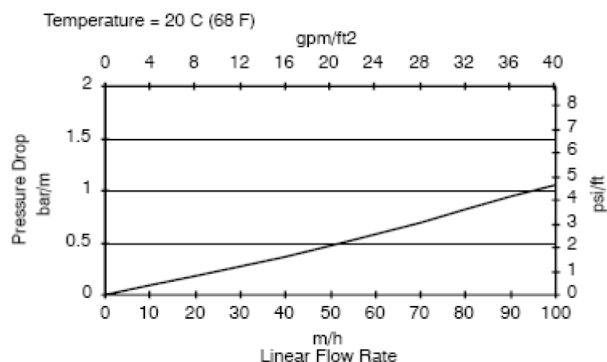


For other temperatures use:

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

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

Figure 2. Pressure Drop Data

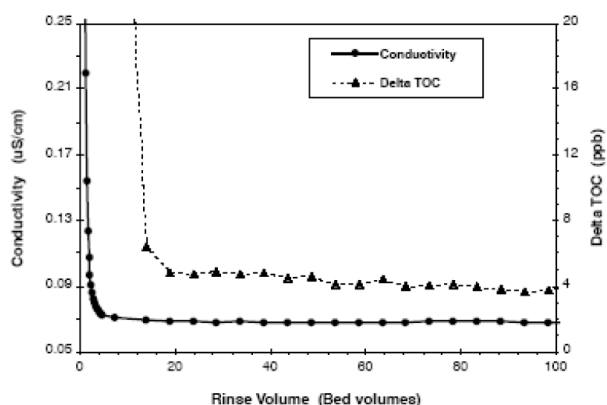


For other temperatures use:

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

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

Figure 3. Conductivity and TOC Rinsedown Curves



Product Stewardship

Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products – from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Customer Notice

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel are available to answer your questions and to provide reasonable technical support. Dow product literature, including safety data sheets, should be consulted prior to use of Dow products. Current safety data sheets are available from Dow.

DOW™ Ion Exchange Resins
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<http://www.dowwaterandprocess.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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