



Tel: +44 (0) 1706 869777
 E-mail: sales@desal.co.uk
 Web: www.desal.co.uk

DOWEX™ MONOSPHERE™ MR-450 UPW
 A Non-Separable Uniform Particle Size Mixed Bed Ion Exchange Resin for Ultrapure Water Production

Product	Resin ratio	Matrix	Functional group
DOWEX™ MONOSPHERE™ MR-450 UPW	Note*	Styrene-DVB, gel	Sulfonic acid and quaternary ammonium

Guaranteed Sales Specifications		H ⁺ form	OH ⁻ form
Total exchange capacity, min.	eq/L kgr/ft ³ as CaCO ₃	1.9 41.5	1.0 21.9
Water content	%	46 - 53	55 - 65
Bead size distribution [†]			
Mean particle size	µm	360 ± 50	590 ± 50
Uniformity coefficient, max.		1.1	1.1
Whole uncracked beads, min.	%	95	95
Crush strength			
Average, min.	g/bead	350	350
> 200 g/bead, min.	%	95	95

Typical Physical and Chemical Properties		H ⁺ form	OH ⁻ form
Particle density	g/mL	1.22	1.08
Shipping weight**	g/L lbs/ft ³	704 44	704 44

Recommended Operating Conditions	• Maximum operating temperature	60°C (140°F)
	• Resin bed depth, min.	800 mm (2.6 ft)
	• Flow rates: Service	10 - 60 m/h (4-24 gpm/ft ²)
	• Pressure drop	see Figure 1

UPW Mixed Resin Specific Properties	• Cationic resin conversion to H	99.7% min.
	• Anionic resin conversion to:	
	OH	95% min.
	CO ₃	5% max.
	Cl	0.1% max.
	• Rinse characteristics:	
	UPW grade resins are rinsed to meet stringent ionic and organic residuals	
	– Ionic conductivity rinse down to 0.055 µS/cm (see Figure 2)	2 bed volumes
	– TOC rinse down to 4 ppb (+) (see Figure 2)	45 bed volumes

Note* Resin ratio of anion to cation is volumetrically optimized to achieve maximum removal of boron, silica and other sensitive ions.

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

(+) delta TOC ppb measured in/out

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

Typical Properties and Applications

DOWEX™ MONOSPHERE™ MR-450 UPW grade resin is a non-separable homogeneous mixed bed resin. It is recommended as a point of use or non-regenerable mixed bed in the polishing loop to achieve sub ppb levels of soluble silica, boron, sodium, potassium, sulfate, chloride, zinc, iron and aluminum. This non-regenerable mixed bed resin is used for two to three years before replacement. The UPW grade product is characterized by the very high conversion to ionic sites (95.0% min.), excellent rinse profiles for conductivity and (delta) TOC and superior crush strength. This homogeneous mixed bed contains 360 micron cation and a 590 micron anion (mean particle size) thus providing efficient kinetics to achieve a higher operating capacity.

Figure 1. Pressure Drop Data

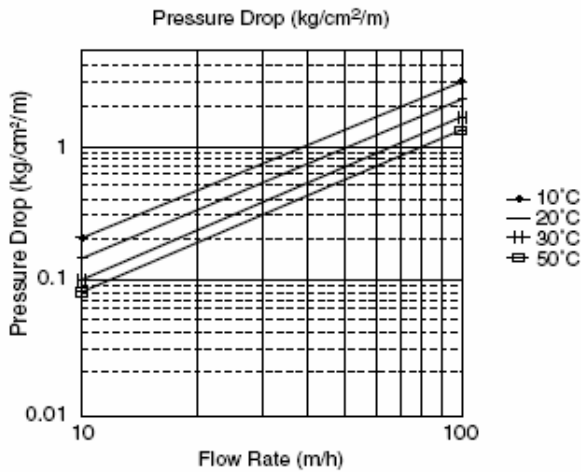
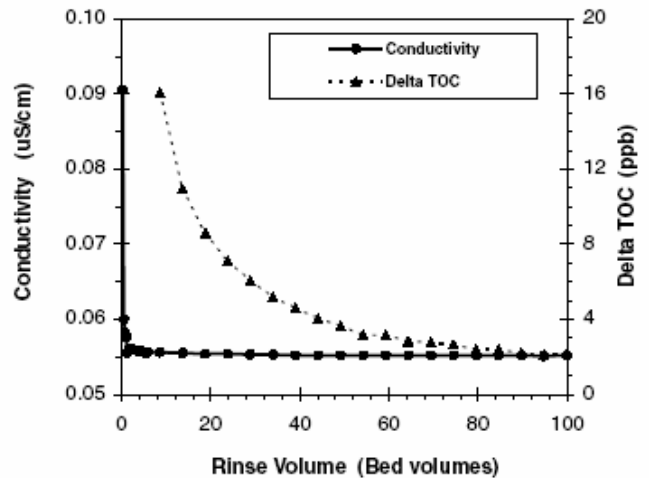


Figure 2. Conductivity and TOC Rinsedown Curves



For other temperatures use:

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

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

DOWEX™ Ion Exchange Resins

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

North America: 1-800-447-4369
 Latin America: (+55) 11-5188-9222
 Europe: (+32) 3-450-2240
 Pacific: +60 3 7958 3392
 Japan: +813 5460 2100
 China: +86 21 2301 9000

<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.

Notice: No freedom from any patent owned by Seller or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other governmental enactments. Seller assumes no obligation or liability for the information in this document. NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.

