



## AMBERJET™ UP4000

### Semiconductor Grade Anion Exchange Resin

#### Introduction

AMBERJET UP4000 resin is a uniform particle size, gel type, strongly basic, anion exchange resin developed specifically for use in producing ultrapure water for the semiconductor industry. It is intended for use in regenerable primary or polishing mixed beds, and it is sold in the fully regenerated hydroxide form to insure minimum impurity leakage. AMBERJET UP4000 resin is designed to be paired with AMBERJET UP1400 anion exchange resin for mixed bed applications.

AMBERJET UP4000 resin can also be used as the anion exchange resin component of a non-regenerable polishing mixed bed to achieve the lowest possible leakage of ionic species, silica, TOC, and sub-micron particles. For full information on the application of Amberjet UP4000 resin in regenerable mixed beds see Applications Guidelines for Regenerable Mixed Beds in High Purity Water (IE-614EDS).

#### Properties

Physical Form	Yellow translucent spherical beads
Matrix	Polystyrene divinylbenzene copolymer
Functional group	Quaternary ammonium
Ionic form as shipped	Hydroxide
Total exchange capacity	≥ 1.10 eq/L (OH <sup>-</sup> form)
Moisture holding capacity	54 to 60 % (OH <sup>-</sup> form)
Shipping weight	689 g/L (43 lb/ft <sup>3</sup> )
Particle Size	
Uniformity coefficient	≤ 1.2
Harmonic mean size	0.58 to 0.68 mm < 0.425 mm 0.5 % max

#### Suggested Operating Conditions

Water Treatment	
Service Flow Rate (as a mixed bed)	20 to 40 BV <sup>*</sup> /h (2.5 to 5 gpm/ft <sup>3</sup> )
Regeneration	
Regenerant	NaOH
Level (100% basis)	90 to 190 g/L (6 to 12 lbs/ft <sup>3</sup> )
Concentration	4 to 5 %
Maximum regeneration temperature	60°C (140° F)
Minimum contact time	30 minutes
Slow rinse (at regeneration flow rate)	1 to 2 BV (8 to 15 gal/ft <sup>3</sup> )
Fast rinse	4 to 8 BV (30 to 60 gal/ft <sup>3</sup> )

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

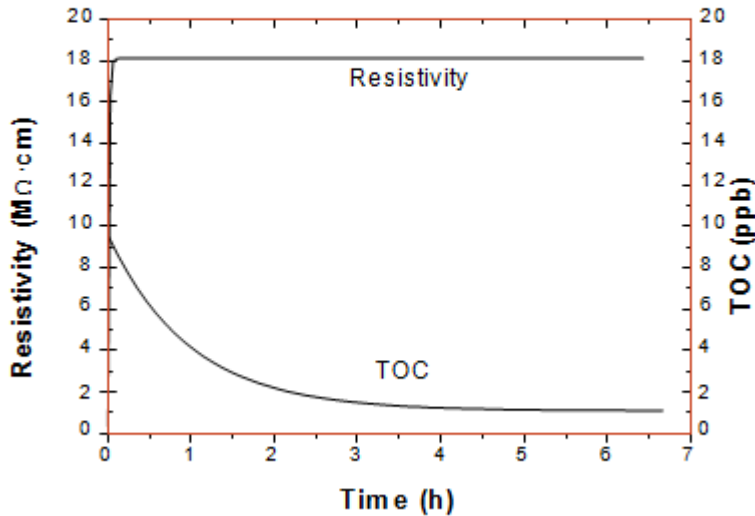
#### Quality assurance

AMBERJET UP4000 resin is QC tested by Dow Water & Process Solutions for resistivity, total organic carbon, and kinetic performance in a mixed bed with AMBERJET UP1400 resin. This insures that all batches of AMBERJET UP4000 resin will meet stringent UPW performance requirements on these most critical parameters.

Dow Water & Process Solutions will fully support the quality and performance of AMBERJET

UP4000 resin and AMBERJET UP1400 resin in UPW applications in order to assure full customer satisfaction that the delivered product is of the highest quality. Typical TOC and resistivity rinse curves based on our quality control procedure for AMBERJET UP4000 resin shown below.

### Resistivity and TOC Rinse Performance



**For more information about DOW™ resins, call the Dow Water & Process Solutions business:**

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