



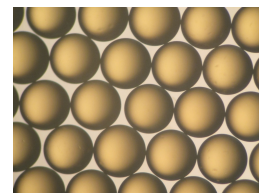
Product Data Sheet

AmberTec™ UP650 H Ion Exchange Resin

Uniform Particle Size, Gel, Strong Acid Cation Exchange Resin for Single Bed and Mixed Bed Demineralization Applications for the Semiconductor

Description

AmberTec™ UP650 H Ion Exchange Resin is a premium-quality, high-capacity, uniform particle size strong acid cation resin designed specifically for use in regenerable mixed beds when highest resin purity and water quality are required.



This resin provides outstanding mechanical strength and very high level of cleanness. It is ideally suited to the high flowrate demands commonly encountered in mixed bed systems. The bead size uniformity and dark color is tailored to complement the smaller, less dense, anionic, gel AmberTec™ UP550 OH Ion Exchange Resin. The color distinction between this pair of resins allows easy visual confirmation of separation following backwash. Together, these resins offer exceptional separation in mixed beds, which combined with excellent water quality and resin purity, has made them known throughout the semiconductor industry as a premium mixed bed pairing.

Resin Pairings

Recommended pairing:

- AmberTec™ UP550 OH Ion Exchange Resin (gel)

Applications

- Regenerable, single beds after reverse osmosis
- Regenerable, primary mixed beds after reverse osmosis
- Regenerable, polishing mixed beds
- Non-regenerable, polishing mixed beds

Historical Reference

AmberTec™ UP650 H Ion Exchange Resin has previously been sold as DOWEX MONOSPHERE™ 650C UPW (H) Ion Exchange Resin.

Typical Properties

Physical Properties	
Copolymer	Styrene-divinylbenzene
Matrix	Gel
Type	Strong acid cation
Functional Group	Sulfonic acid
Physical Form	Dark amber, translucent, spherical beads
Chemical Properties	
Ionic Form as Shipped	H ⁺
Total Exchange Capacity	≥ 2.0 eq/L (H ⁺ form)
Water Retention Capacity	46.0 – 52.0% (H ⁺ form)
Ionic Conversion	
H ⁺	≥ 99%
Particle Size §	
Particle Diameter	650 ± 50 µm
Uniformity Coefficient	≤ 1.10
< 300 µm	≤ 0.2%
> 850 µm	≤ 5.0%
Purity	
Metals, dry basis	
Na	≤ 25 mg/kg
Fe	≤ 25 mg/kg
Cu	≤ 15 mg/kg
Al	≤ 15 mg/kg
Stability	
Whole Uncracked Beads	≥ 95%
Friability	
Average	≥ 500 g/bead
> 200 g/bead	≥ 95%
Density	
Shipping Weight	785 g/L

§ For additional particle size information, please refer to the [Particle Size Distribution Cross Reference Chart](#) (Form No. 45-D00954-en)

Suggested Operating Conditions

Temperature Range (H ⁺ form)	5 – 60°C (41 – 140°F)
pH Range (Stable)	0 – 14

For additional information regarding recommended minimum bed depth, operating conditions, and regeneration conditions for [mixed beds](#) (Form No. 45-D01127-en) or [separate beds](#) (Form No. 45-D01131-en) in water treatment, please refer to our Tech Facts.

Hydraulic Characteristics

Estimated bed expansion of AmberTec™ UP650 H Ion Exchange Resin as a function of backwash flowrate and temperature is shown in Figure 1.

Estimated pressure drop for AmberTec™ UP650 H as a function of service flowrate and temperature is shown in Figure 2. These pressure drop expectations are valid at the start of the service run with clean water.

Figure 1: Backwash Expansion

Temperature = 10 – 60°C (50 – 140°F)

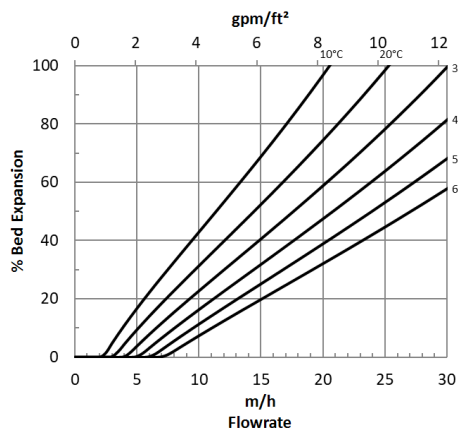
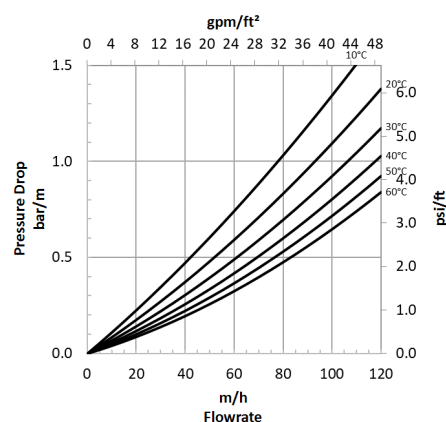


Figure 2: Pressure Drop

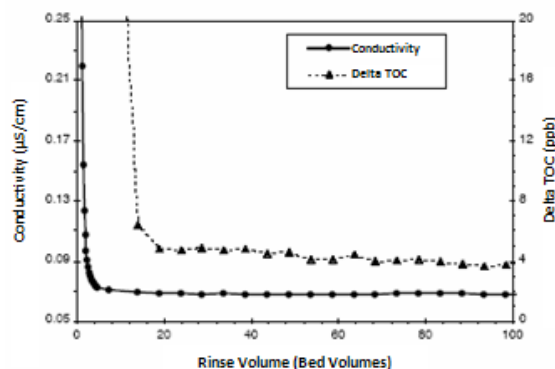
Temperature = 10 – 60°C (50 – 140°F)



UPW Rinse Properties

AmberTec™ UP Ion Exchange Resins are especially processed and controlled in Quality to ensure the purest treated water quality for semiconductor applications. Typical single bed rinse-down curves for conductivity and total organic carbon (TOC) to Δ TOC = 4 ppb as a function of rinse volume (in bed volumes) is shown in Figure 3.

Figure 3: Conductivity and TOC Rinse-down



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Please be aware of the following:

- **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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