

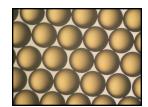
Product Data Sheet

DuPont™ AmberLite™ HPR1400 H Ion Exchange Resin

Uniform Particle Size, Gel, Strong Acid Cation Exchange Resin for Condensate Polishing Applications for the Nuclear Power Industry

Description

DuPont™ AmberLite™ HPR1400 H Ion Exchange Resin is designed specifically for condensate polishing applications in PWR nuclear power generating plants using ethanolamine (ETA) when highest resin purity and water quality are required.



When used in mixed beds with AmberLite™ HPR9000 OH Ion Exchange Resin, AmberLite™ HPR1400 H is the first cation resin to offer protection from the sulfate kinetic problem that

has commonly plagued many PWR polishers operating with ETA chemistry. This resin has been demonstrated to mitigate the ETA-related surface fouling of the anion resin in mixed beds, thus stabilizing sulfate removal kinetics and notably increasing anion resin life and overall polisher performance.

Based on the well-established chemistry of AmberLite™ HPR650 H Ion Exchange Resin, AmberLite™ HPR1400 H will deliver the same operating capacity, durability, and hydraulic performance that has been known and appreciated for years in PWR condensate polishing systems.

Resin Pairings

Recommended pairing:

AmberLite[™] HPR9000 OH Ion Exchange Resin (macroporous)

Applications

 Mixed bed condensate polishing in PWR nuclear power plants using ethanolamine (ETA)

Historical Reference

AmberLite™ HPR1400 H Ion Exchange Resin has previously been sold as DOWEX MONOSPHERE™ 1400PC (H) Ion Exchange Resin.

Typical Properties

Physical Properties		
Copolymer	Styrene-divinylbenzene	
Matrix	Gel	
Туре	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	45.0 – 52.0% (H ⁺ form)	
Ionic Conversion		
H+	≥99%	
Particle Size §		
Particle Diameter	$650\pm50~\mu m$	
Uniformity Coefficient	<u>≤</u> 1.20	
< 300 μm	≤ 0.5%	
< 425 µm	≤ 1.0%	
> 1180 µm	≤ 1.0%	
Purity		
Metals, dry basis:		
Na	≤ 50 mg/kg	
Fe	≤ 50 mg/kg	
Cu	≤ 10 mg/kg	
Ca	≤ 50 mg/kg	
Mg	≤ 50 mg/kg	
Al	≤ 50 mg/kg	
Heavy Metals (as Pb)	≤ 10 mg/kg	
Stability		
Whole Uncracked Beads	≥ 95%	
Friability:		
Average	≥ 500 g/bead	
> 200 g/bead	≥ 95%	
Swelling	$Na^+ \rightarrow H^+: 7\%$	
Density		
Particle Density	1.22 g/mL	
Shipping Weight	760 g/L	

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

Temperature Range (H ⁺ form)	5 – 150°C (41 – 302°F)
pH Range (Stable)	0 – 14

Suggested Operating Conditions

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

Hydraulic Characteristics

Estimated bed expansion of DuPont™ AmberLite™ HPR1400 H Ion Exchange Resin as a function of backwash flowrate and temperature is shown in Figure 1.

Estimated pressure drop for AmberLite™ HPR1400 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 = $10 - 60^{\circ}\text{C} (50 - 140^{\circ}\text{F})$

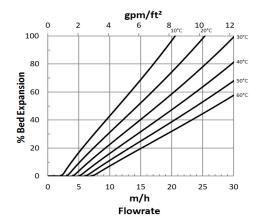
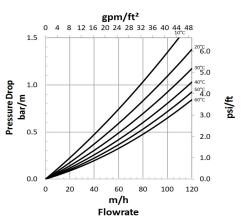


Figure 2: Pressure Drop

Temperature = $10 - 60^{\circ}$ C ($50 - 140^{\circ}$ F)



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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.

Have a question? Contact us at:

www.dupont.com/water/contact-us

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