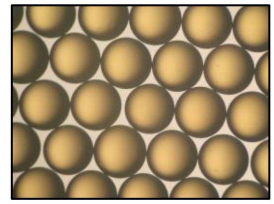
Product Data Sheet

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



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Historical Reference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.

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May 2018

Typical Physical and Chemical 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	45.0 – 52.0% (H^+ form)
Ionic Conversion	
H^+	≥ 99.7%
Particle Size	
Particle Diameter §	650 ± 50 µm
Uniformity Coefficient	≤ 1.10
< 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	820 g/L

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

Suggested Operating Conditions**

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

For additional information regarding recommended minimum bed depth, operating conditions, and regeneration conditions for mixed beds (Form No. 177-03705) or separate beds (Form No. 177-03729) in water treatment, please refer to our Tech Facts.

Hydraulic Characteristics

Estimated bed expansion of 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°C (50 – 140°F)

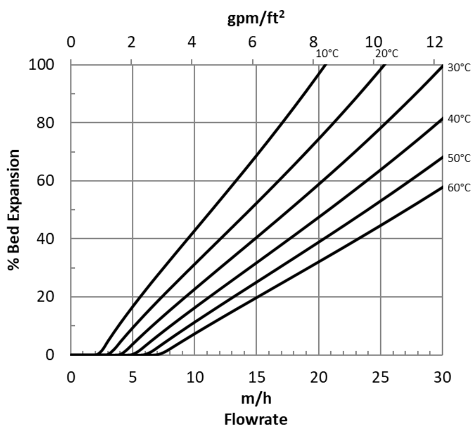
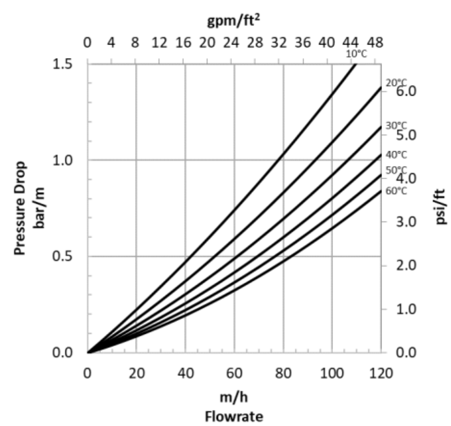


Figure 2: Pressure Drop

Temperature = 10 – 60°C (50 – 140°F)



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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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