



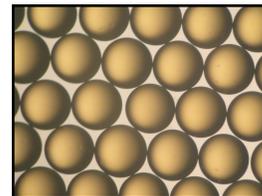
## Product Data Sheet

### **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#### **Historical Reference**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.

## Typical Properties

<b>Physical Properties</b>	
Copolymer	Styrene-divinylbenzene
Matrix	Gel
Type	Strong acid cation
Functional Group	Sulfonic acid
Physical Form	Dark amber, translucent, spherical beads
<b>Chemical Properties</b>	
Ionic Form as Shipped	H <sup>+</sup>
Total Exchange Capacity	≥ 2.0 eq/L (H <sup>+</sup> form)
Water Retention Capacity	45.0 – 52.0% (H <sup>+</sup> form)
Ionic Conversion	
H <sup>+</sup>	≥ 99.7%
<b>Particle Size</b> §	
Particle Diameter	650 ± 50 µm
Uniformity Coefficient	≤ 1.10
< 300 µm	≤ 0.5%
< 425 µm	≤ 1.0%
> 1180 µm	≤ 1.0%
<b>Purity</b>	
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
<b>Stability</b>	
Whole Uncracked Beads	≥ 95%
Friability:	
Average	≥ 500 g/bead
> 200 g/bead	≥ 95%
Swelling	Na <sup>+</sup> → H <sup>+</sup> : 7%
<b>Density</b>	
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 <sup>+</sup> form)	5 – 150°C (41 – 302°F)
pH Range (Stable)	0 – 14

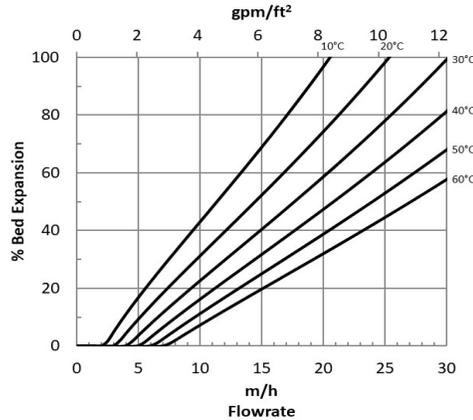
For additional information regarding recommended minimum bed depth, operating conditions, and regeneration conditions for [mixed beds](#) (Form No. 177-03705) or [separate beds](#) (Form No. 177-03729) in water treatment, please refer to our Tech Facts.

## Hydraulic Characteristics

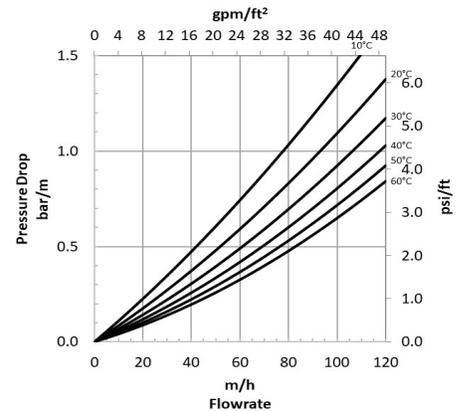
Estimated bed expansion of AMBERLITE™ HPR1400 H Ion Exchange Resin as a function of backwash flowrate and temperature is shown in Figure 1.

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)



## Product Stewardship

DuPont has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with DuPont products— from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

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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](http://www.dupont.com/water/contact-us)

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