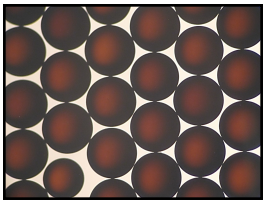
Product Data Sheet

AMBERLITE™ HPR1600 H Ion Exchange Resin

Uniform Particle Size, Gel, Strong Acid Cation Exchange Resin for Condensate Polishing and Mixed Bed Demineralization Applications for the Power Industry

Description



AMBERLITE™ HPR1600 H Ion Exchange Resin is designed specifically for use in nuclear condensate polishing mixed beds when highest resin purity and water quality are required. This resin is our highest-capacity cation resin with exceptional physical and oxidative stability due to its very high level of DVB crosslinker.

The exceptional physical and oxidative stability minimizes the release of organic sulfonate leachables (TOC), helping to preserve the kinetic response of the anion exchange resin in the mixed bed, enabling lower levels of sulfate in the steam generator or boiler, which is especially critical in PWR plants where organic amines are used. The chemical stability also makes it especially suitable for high-temperature operation, as in air-cooled condenser systems.

The high capacity of AMBERLITE™ HPR1600 H can extend the hydrogen cycle run length by as much as 20% compared to a standard condensate polishing cation resin, and this proportionally reduces the number of regenerations and effort needed to operate the condensate polishing plant.

The exceptionally good backwash separation characteristics of AMBERLITE™ HPR1600 H further simplify the regeneration process, and the black color of the resin allows easy visual confirmation of separation from the light-colored AMBERLITE™ HPR9000 OH Ion Exchange Resin.

Resin Pairings

Recommended pairing:

- AMBERLITE™ HPR9000 OH Ion Exchange Resin (macroporous)

Additional options:

- AMBERLITE™ HPR550 OH Ion Exchange Resin (gel)
- AMBERLITE™ HPR9000 SO_4 Ion Exchange Resin (macroporous)

Applications

- Mixed bed condensate polishing in PWR nuclear power plants
- Mixed bed condensate polishing in fossil power plants
- Mixed bed polishing in industrial demineralization
- Condensate polisher cation pre-beds
- Condensate polishing in power plants operated with amine cycle
- Condensate polishing air-cooled condenser systems
- Start-up regenerable condensate polishing systems in nuclear power plants

Historical Reference

AMBERLITE™ HPR1600 H Ion Exchange Resin has previously been sold as AMBERJET™ 1600 H Ion Exchange Resin.

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June 2019

Typical Properties

Physical Properties	
Copolymer	Styrene-divinylbenzene
Matrix	Gel
Type	Strong acid cation
Functional Group	Sulfonic acid
Physical Form	Black, translucent, spherical beads
Chemical Properties	
Ionic Form as Shipped	H^+
Total Exchange Capacity	≥ 2.40 eq/L (H^+ form)
Water Retention Capacity	36.0 – 43.0% (H^+ form)
Ionic Conversion	
H^+	≥ 99%
Particle Size [§]	
Particle Diameter	650 ± 50 µm
Uniformity Coefficient	≤ 1.1
< 425 µm	≤ 0.5%
> 850 µm	≤ 10%
Purity	
Metals, dry basis:	
Na	≤ 25 mg/kg
Fe	≤ 50 mg/kg
Stability	
Whole Uncracked Beads	≥ 95%
Friability:	
Average	≥ 1000 g/bead
> 200 g/bead	≥ 95%
Swelling	$Na^+ \rightarrow H^+$ ≤ 4%
Density	
Particle Density	1.27 g/mL
Shipping Weight	840 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.

Form No. 177-03741, Rev. 1
June 2019

Hydraulic Characteristics

Estimated bed expansion of AMBERLITE™ HPR1600 H Ion Exchange Resin as a function of backwash flowrate and temperature is shown in Figure 1.

Estimated pressure drop for AMBERLITE™ HPR1600 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)

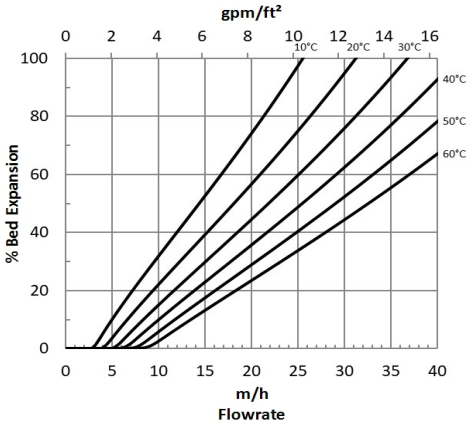
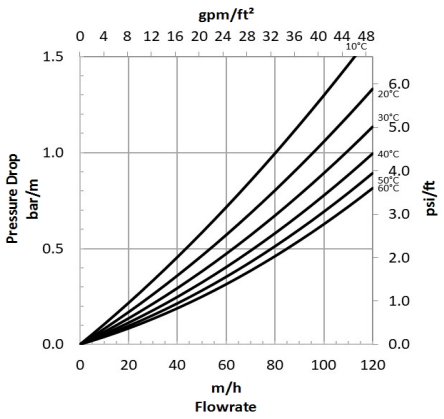


Figure 2: Pressure Drop

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.

Customer Notice

DuPont strongly encourages its customers to review both their manufacturing processes and their applications of DuPont products from the standpoint of human health and environmental quality to ensure that DuPont products are not used in ways for which they are not intended or tested. DuPont personnel are available to answer your questions and to provide reasonable technical support. DuPont product literature, including safety data sheets, should be consulted prior to use of DuPont products. Current safety data sheets are available from DuPont.

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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