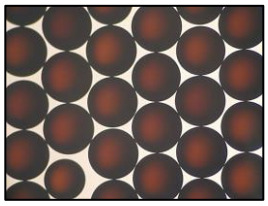
Product Data Sheet

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Historical Reference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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May 2018

Typical Physical and Chemical 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.

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)

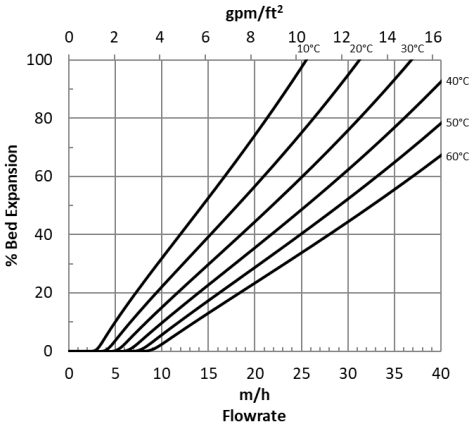
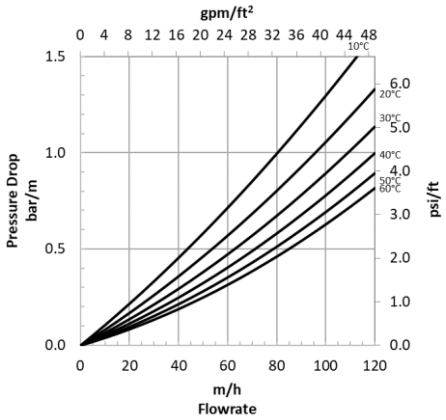


Figure 2: Pressure Drop

Temperature = 10 – 60°C (50 – 140°F)



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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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