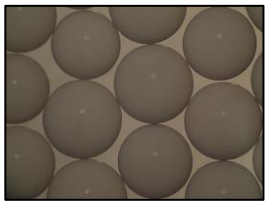
Product Data Sheet

AMBERLITE™ HPR2000 H Ion Exchange Resin

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

Description



AMBERLITE™ HPR2000 H Ion Exchange Resin is intended for use in mixed bed polishing applications when highest resin purity and water quality are required. The very high level of DVB crosslinker, combined with a macroporous structure, offers exceptional physical and oxidative stability and sodium selectivity.

The exceptional physical and oxidative stability maximizes useful life of the cation resin. These properties also minimize 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. The high sodium selectivity allows longest runtimes in amine cycle operation.

AMBERLITE HPR2000 H can operate reliably under the high flowrate and pressure drop conditions that are typically used in condensate polishers. The particle size and uniformity and color distinction of AMBERLITE HPR2000 H allow for excellent backwash separation when used in mixed beds with AMBERLITE™ HPR9000 OH Ion Exchange Resin, which offers excellent resistance to surface fouling. Together, these resins are known throughout the industry as a premium macroporous mixed bed resin pairing.

Resin Pairings

Recommended pairing:

- AMBERLITE™ HPR9000 OH Ion Exchange Resin (macroporous)

Additional options:

- AMBERLITE™ HPR550 OH Ion Exchange Resin (gel) – in external regeneration systems
- 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
- Condensate polishing in power plants operated with amine cycle
- Systems requiring exceptionally high osmotic stability

Historical Reference

AMBERLITE™ HPR2000 H Ion Exchange Resin has previously been sold as AMBERJET™ 2000 H Ion Exchange Resin.

Form No. 177-03742, Rev. 0
May 2018

Typical Physical and Chemical Properties**

Physical Properties	
Copolymer	Styrene-divinylbenzene
Matrix	Macroporous
Type	Strong acid cation
Functional Group	Sulfonic acid
Physical Form	Gray to beige, opaque, spherical beads
Chemical Properties	
Ionic Form as Shipped	H^+
Total Exchange Capacity	≥ 1.7 eq/L (H^+ form)
Water Retention Capacity	51.0 – 56.0% (H^+ form)
Particle Size	
Particle Diameter §	950 ± 50 µm
Uniformity Coefficient	≤ 1.2
< 300 µm	≤ 0.3%
> 1180 µm	≤ 6.0%
Purity	
Metals, dry basis:	
Na	≤ 25 mg/kg
Fe	≤ 50 mg/kg
Cu	≤ 10 mg/kg
Stability	
Whole Uncracked Beads	≥ 95%
Friability:	
Average	≥ 350 g/bead
> 200 g/bead	≥ 95%
Swelling	$Na^+ \rightarrow H^+$ ≤ 6%
Density	
Particle Density	1.18 g/mL
Shipping Weight	770 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™ HPR2000 H Ion Exchange Resin as a function of backwash flowrate and temperature is shown in Figure 1.

Estimated pressure drop for AMBERLITE HPR2000 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)

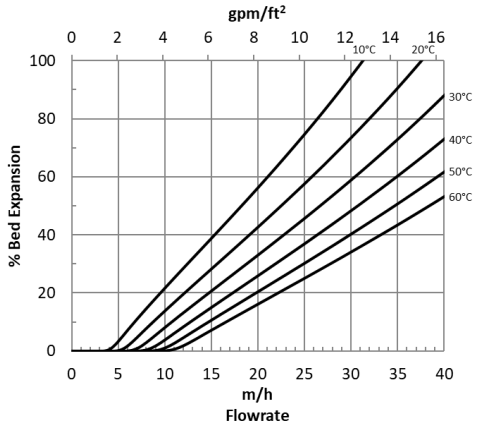
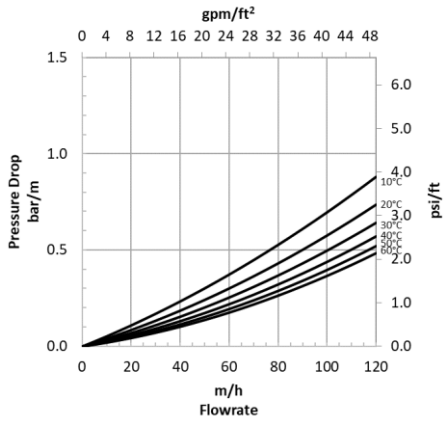


Figure 2: Pressure Drop

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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Form No. 177-03742, Rev. 0
May 2018