Product Data Sheet

AMBERLITE™ HPR4780 Cl Ion Exchange Resin

Acrylic, Gel, Strong Base Anion Exchange Resin for Industrial Demineralization Applications

Description

AMBERLITE™ HPR4780 Cl Ion Exchange Resin is a high-quality, bifunctional resin for use in industrial demineralization applications when high performance and cost-effective operation is required. The chemical properties and particle size of the resin have been balanced to combine a high operating capacity with low pressure drop, while reducing chemical regenerant and water usage.

A bifunctional anion exchange resin combines weak base functionality with strong base functionality which enables AMBERLITE HPR4780 Cl to achieve removal of free mineral acids and weakly dissociated ions like silica and carbon dioxide.

Acrylic anion resins have a hydrophilic structure providing unique chemical and physical properties allowing for easy release of the accumulated natural organic compounds during the regeneration step. The properties of the acrylic structure also enables it to withstand high osmotic or mechanical stress.

This resin is ideally suited for treating waters with high organic fouling potential, more than 75% free mineral acidity, up to 10% silica, and temperature up to 35°C (95°F). Under these conditions AMBERLITE HPR4780 Cl will give excellent operating capacity with low caustic regenerant consumption. The particle size distribution of AMBERLITE HPR4780 Cl has been specially selected to give optimum performance in floating and packed bed applications.

For systems that require low silica in the effluent or that operate in higher temperatures, a Type I strong base anion resin is recommended, such as:

- AMBERLITE™ HPR4200 Cl or OH Ion Exchange Resin
- AMBERLITE™ HPR4800 Cl or OH Ion Exchange Resin

Applications

- Demineralization
  - Ideally when treating water with:
    - High organic fouling potential
    - High percentage of mineral acidity (FMA)
  - When the treatment goal is:
    - Removal of strong and weak acids

System Designs

- Co-current
- Counter-current / Hold-down
- Packed beds

Historical Reference

AMBERLITE™ HPR4780 Cl Ion Exchange Resin has previously been sold as AMBERLITE™ IRA478RF Ion Exchange Resin.

Form No. 177-03789, Rev. 0
May 2018

Typical Physical and Chemical Properties**

Physical Properties	
Copolymer	Crosslinked acrylic
Matrix	Gel
Type	Strong base anion, Type I + Weak base anion
Functional Group	Quaternary ammonium + Tertiary amine
Physical Form	White, translucent, spherical beads
Chemical Properties	
Ionic Form as Shipped	Cl^- + Free base (FB)
Total Exchange Capacity	≥ 1.35 eq/L (Cl^- form)
Strong Base	33.0 – 43.0%
Water Retention Capacity	58.0 – 62.0% (Cl^- form)
Particle Size ‡	
Particle Diameter §	700 – 900 µm
Uniformity Coefficient	≤ 1.70
< 300 µm	≤ 0.2%
> 1180 µm	≤ 15.0%
Stability	
Whole Uncracked Beads	≥ 95%
Swelling	$Cl^- \rightarrow OH^-$ ≤ 10%
Density	
Particle Density	1.08 g/mL
Shipping Weight	660 g/L

‡ Particle size distribution is tailored for packed bed operation.
§ For additional particle size information, please refer to the Particle Size Distribution Cross Reference Chart (Form No. 177-01775).

Suggested Operating Conditions**

Temperature Range (OH^-/FB form)	5 – 35°C (41 – 95°F)
pH Range	
Service Cycle	0 – 9
Stable	0 – 14

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

Hydraulic Characteristics

Estimated bed expansion of AMBERLITE™ HPR4780 Cl Ion Exchange Resin as a function of backwash flowrate and temperature is shown in Figure 1.

Estimated pressure drop for AMBERLITE HPR4780 Cl 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 and a well-classified bed.

Figure 1: Backwash Expansion

Temperature = 10 – 60°C (50 – 140°F)

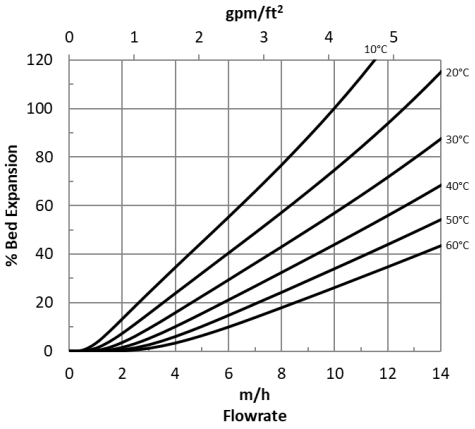
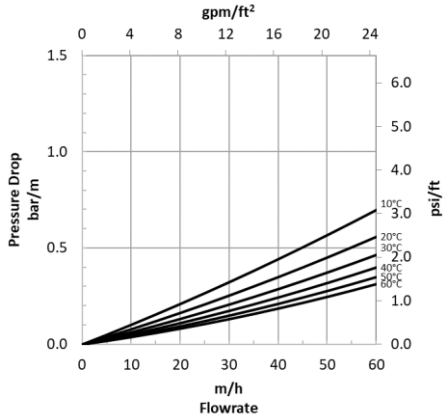


Figure 2: Pressure Drop

Temperature = 10 – 60°C (50 – 140°F)



Product Stewardship

Dow 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 Dow products—from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Customer Notice

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

For more information, contact our Customer Information Group:

Asia Pacific	+86 21 3851 4988
Europe, Middle East, Africa	+31 115 672626
Latin America	+55 11 5184 8722
North America	1-800-447-4369

www.dowwaterandprocess.com

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.

NOTICE: No freedom from infringement of any patent owned by Dow or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other government enactments. The product shown in this literature may not be available for sale and/or available in all geographies where Dow is represented. The claims made may not have been approved for use in all countries. Dow assumes no obligation or liability for the information in this document. References to "Dow" or the "Company" mean the Dow legal entity selling the products to Customer unless otherwise expressly noted. NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.

**All information set forth herein is for informational purposes only. This information is general information and may differ from that based on actual conditions. Please note that physical properties may vary depending on certain conditions and while operating conditions stated in this document are intended to lengthen product lifespan and/or improve product performance, it will ultimately depend on actual circumstances and is in no event a guarantee of achieving any specific results. Nothing in this document should be treated as a warranty by Dow.

Form No. 177-03789, Rev. 0
May 2018