

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Historical Reference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.

Typical 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 ⁻ → OH ⁻ ≤ 10%
Density	
Particle Density	1.08 g/mL
Shipping Weight	660 g/L

§ For additional particle size information, please refer to the [Particle Size Distribution Cross Reference Chart](#) (Form No. 45-D00954-en).

‡ Particle size distribution is tailored for packed bed operation.

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. 45-D01131-en) 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)

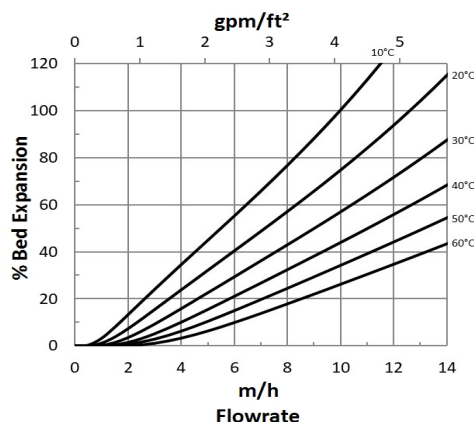
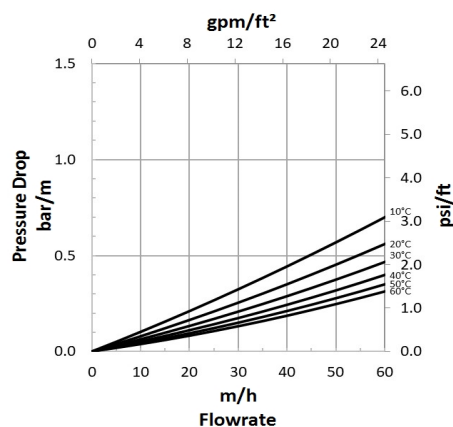


Figure 2: Pressure Drop

Temperature = 10 – 60°C (50 – 140°F)



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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.



info@lenntech.com Tel. +31-152-610-900
www.lenntech.com Fax. +31-152-616-289

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