AmberLite™ XAD™1600N Polymeric Adsorbent

Macroporous, Adsorbent Resin

Key Features

- White insoluble beads.
- High surface area and controlled pore size
- Closely controlled particle size.
- Excellent physical and thermal stability in addition to a low swelling between solvent and aqueous media.

Key Applications

- Recovery and purification of antibiotics, water-soluble steroids, amino acids, and proteins.
- Purification of contrast agents media.
- Removal of non-polar compounds from polar solvents.

Typical Properties

Physical Properties	
Copolymer	Crosslinked DVB
Matrix	Macroporous
Type	Adsorbent
Physical Form	White, opaque, spherical beads
Nitrogen BET	
Surface Area	800 m^2/g
Average Pore Diameter	150 Å
Total Pore Volume	≥ 0.55 mL/mL
Chemical Properties	
Water Retention Capacity	66 – 73%
Particle Size [§]	
Particle Diameter	400 ± 50 µm
Uniformity Coefficient	≤ 1.25
< 212 µm	≤ 0.5%
Swelling (in solvent)	
Methanol	15 – 20%
2-Propanol	15 – 20%
Acetone	15 – 20%
Density	
Particle Density	1.015 – 1.025 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).

Suggested Operating Conditions

Maximum Operating Temperature	150°C (302°F)
pH Range (Stable)	1 – 14
Bed Depth, min.	
Chromatography	1500 mm (4.9 ft)
Flowrates	
Loading	1 – 4 BV*/h (usually)
Elution/Desorption	1 – 4 BV/h
Regeneration	1 – 4 BV/h
Rinse	1 – 8 BV/h
Regenerants or Eluting Agents	• Water-miscible organic solvents (methanol, ethanol, isopropanol, acetone, etc.) for hydrophobic compounds • Pure solvents for regenerating resin fouled by oils and antifoams • Dilute bases (0.1 - 0.5% NaOH) for weakly acidic compounds • Dilute acids (0.1-0.5% HCl) for weakly basic compounds • Dilute oxidizing agents (< 0.5%) such as peroxide to enhance the removal of protein fouling • Buffer elution for pH-sensitive compounds • Water when adsorption is from an ionic solution

[*] 1 BV (Bed Volume) = 1 m^3 solution per m^3 resin or 7.5 gal per ft^3 resin

Hydraulic Characteristics

Estimated bed expansion of AmberLite™ XAD™1600N Polymeric Adsorbent as a function of backwash flowrate and temperature is shown in Figure 1.

Estimated pressure drop for AmberLite™ XAD™1600N as a function of service flowrate and water temperature is shown in Figure 2. These pressure drop expectations are valid at the start of the service run with clean feed.

Figure 1: Backwash Expansion

Temperature = 10 – 60°C (50 – 140°F)

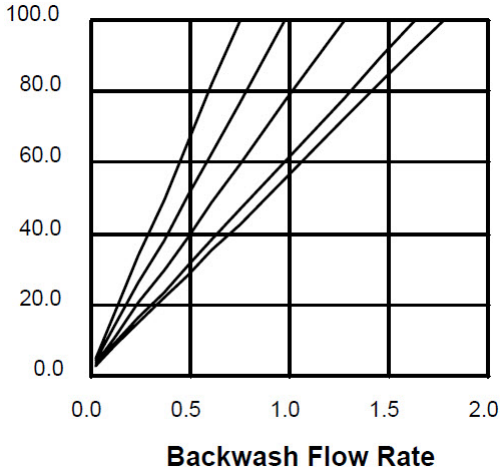
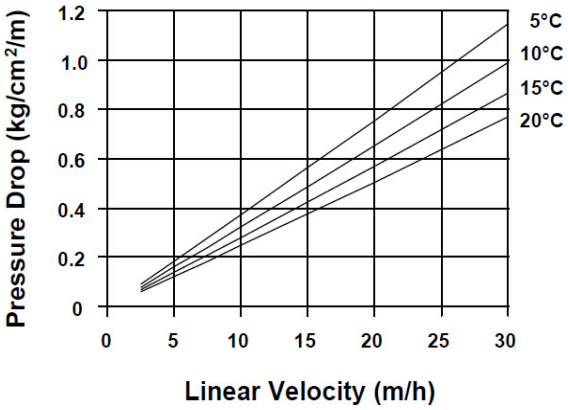


Figure 2: Pressure Drop

Temperature = 4.4 – 65.6°C (40 – 150°F)



General Information

Pretreatment

AmberLite™ XAD™1600N Polymeric Adsorbent is shipped as a water-wet product imbibed with sodium chloride (NaCl) and sodium carbonate (Na_2CO_3) salts to inhibit bacterial growth. These salts must be washed from the adsorbent prior to use and it is suggested that this be achieved by washing with water at a linear flowrate of 5 – 10 m/h until the required level is achieved. In some sensitive applications, residual monomeric or oligomeric compounds may be required to be removed from the adsorbent. A regeneration with the proposed regenerant is also recommended prior to beginning the first service cycle. If the regenerant is an alcohol, it must be displaced with water prior to beginning the first loading cycle.

Important Information

- Polymeric adsorbents, as produced, contain by-products resulting from the manufacturing process. The user must determine the extent to which organic by-product must be removed for any particular use and establish techniques to assure that the appropriate level of purity is achieved for that use.
- Like any chromatographic stationary phase, a conditioning step with the working solvent must be performed before operation.
- **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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