



AMBERLITE™ XAD™ 4 Industrial Grade Polymeric Adsorbent

Description

AMBERLITE™ XAD™ 4 is a polymeric adsorbent, supplied as white insoluble beads. It is a non ionic crosslinked polymer which derives its adsorptive properties from its patented macroreticular structure (containing both a continuous polymer phase and a continuous pore phase), high surface area and the aromatic nature of its surface (Figure 1). This structure gives AMBERLITE XAD 4 Polymeric Adsorbent excellent physical, chemical and thermal stability. AMBERLITE XAD 4 Polymeric Adsorbent can be used through repeated cycles, in column or batch modes, to adsorb hydrophobic molecules from polar solvents or volatile organic compounds from vapor streams. Its characteristic pore size distribution makes AMBERLITE XAD 4 an excellent choice for the adsorption of organic substances of relatively low molecular weight.

Typical Properties

(These are typical properties, not to be construed as specifications.)

Physical form	White translucent beads
Matrix	Macroreticular crosslinked aromatic polymer
Moisture holding capacity ^[1]	54–60%
Shipping weight	42.4 lbs/ft ³
Specific gravity	1.01–1.03
Particle size	
Harmonic mean size	0.49–0.69 mm
Uniformity coefficient	≤ 2.0
Fines content ^[1]	< 0.350 mm : 5.0% max
Coarse beads	> 1.18 mm : 5.0% max
Maximum reversible swelling	See Table 1
Surface area ^[2]	≥ 750 m ² /g
Porosity ^[2]	≥ 0.50 ml/ml

^[1] Contractual value

^[2] Values based on statistical quality control (SQC)

Test methods are available on request.

Suggested Operating Conditions

pH range	0–14
Maximum temperature limit	300°F
Minimum bed depth	30 inches
Flow rate	
Loading	0.25–2 gpm/ft ³
Displacement	0.125–0.50 gpm/ft ³
Regeneration	0.125–0.50 gpm/ft ³
Rinse	0.25–2 gpm/ft ³

Additional Properties

Figure 1. Chemical Structure of AMBERLITE™ XAD™ 4 Polymeric Adsorbent

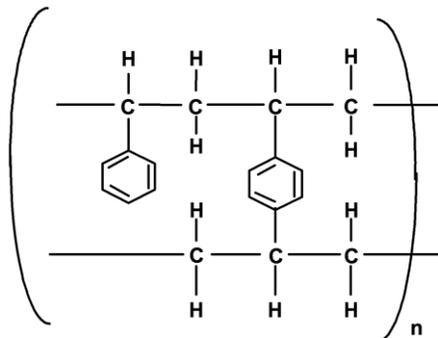


Figure 2. Pore Distribution of AMBERLITE™ XAD™ 4 Polymeric Adsorbent

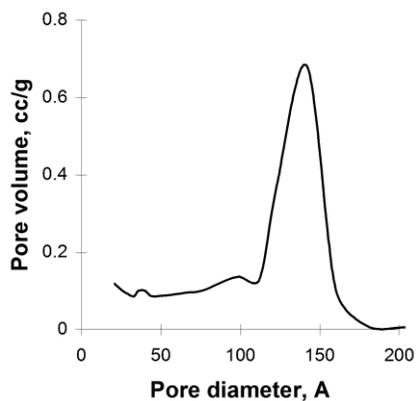


Figure 3. Infrared Spectrum of AMBERLITE™ XAD™ 4 Polymeric Adsorbent

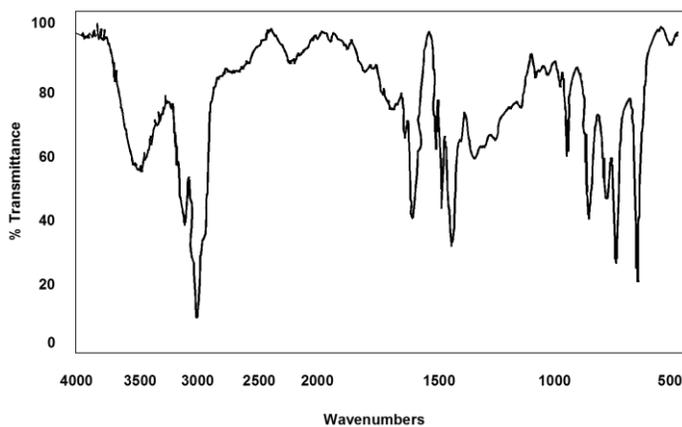


Table 1. Percent Swelling of AMBERLITE™ XAD™ 4 Polymeric Adsorbent in Various Solvents (Water: Solvent)

Solvent	% Increase from as-received volume
Methanol	20
2-propanol	20
Acetone	20
p-Xylene (via methanol)	25

Applications

- Removal of organic pollutants from aqueous wastes, ground water, and vapor streams.
- Removal of organic compounds from aqueous process streams and polar solvents.
- Recovery / recycle of phenolic and aromatic compounds.
- Removal of chlorinated solvents, herbicides, and pesticides from aqueous streams.

Regenerants and Eluting Agents

- Water miscible organic solvents (methanol, ethanol, acetone, isopropanol, etc.) for hydrophobic compounds.
- Pure solvents for regenerating resin fouled by oils and antifoams.
- Dilute bases (0.1–0.5% NaOH) for eluting weakly acidic compounds.
- Strong bases (2–4% NaOH) for regenerating resins fouled with proteins, peptides.
- Dilute acids (0.1–0.5% HCl) for weakly basic compounds.
- Dilute oxidising agents (< 0.5%) such as peroxide to enhance the removal of protein fouling.
- Buffer elution for pH sensitive compounds.
- Water where adsorption is from an ionic solution.
- Hot nitrogen or steam for volatile materials.

Hydraulic Characteristics

Figure 4 shows the bed expansion of AMBERLITE™ XAD™ 4 Polymeric Adsorbent as a function of backwash flow rate and water temperature. Figure 5 shows the pressure drop for AMBERLITE XAD 4, as a function of service flow rate and water temperature. Pressure drop data are valid at the start of the service run with clear water and a correctly classified bed.

Figure 4. Bed Expansion

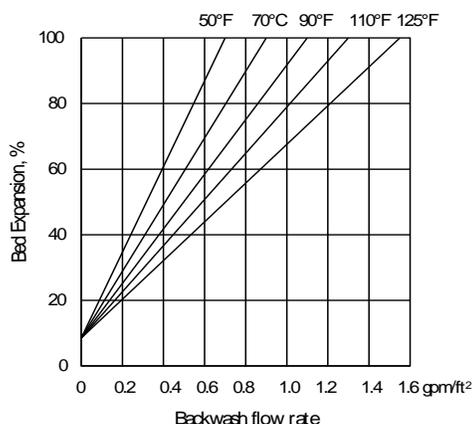
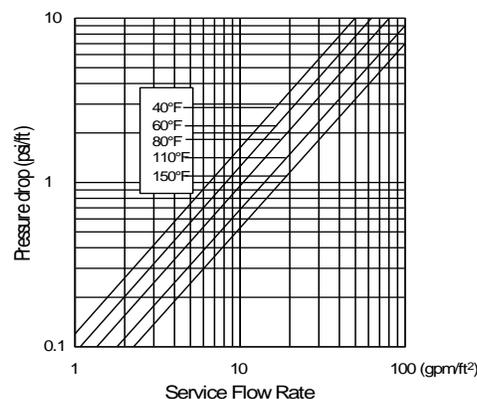


Figure 5. Pressure Drop



Handling Precautions

Before using this product, consult the Material Safety Data Sheet (MSDS)/Safety Data Sheet (SDS) for details on product hazards, recommended handling precautions and product storage.

Storage

Store products in tightly closed original containers at temperatures recommended on the product label.

Disposal Considerations

Dispose in accordance with all local, state (provincial) and federal regulations. Empty containers may contain hazardous residues. This material and its container must be disposed in a safe and legal manner.

It is the user's responsibility to verify that treatment and disposal procedures comply with local, state (provincial) and federal regulations. Contact your Dow Technical Representative for more information.

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.

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.

DOWEX™ Ion Exchange Resins For more information about DOWEX™ resins, call the Dow Water & Process Solutions business:

North America: 1-800-447-4369
Latin America: (+55) 11-5188-9222
Europe: (+32) 3-450-2240
Pacific: +60 3 7958 3392
Japan: +813 5460 2100
China: +86 21 2301 1000
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