



Product Data Sheet

AmberSorb™ V503 Polymeric Adsorbent

Industrial-grade Adsorbent for Removal of Organics from Humid Air Streams

Description

AmberSorb™ V503 Polymeric Adsorbent is a styrenic polymer that is insoluble in strong acid, strong base, or organic solvents. With an average 1-mm diameter bead, AmberSorb™ V503 is designed to give lower pressure drop in vapor-phase applications while retaining all the other attributes of the smaller particle size AmberSorb™ V493 Polymeric Adsorbent:

- Highly crosslinked polymer matrix
- Unique pore size distribution
- High surface area
- Improved capacity for organic compounds
- Hydrophobic adsorbent surface
- Non-catalytic activity
- Spherical beads with good physical strength

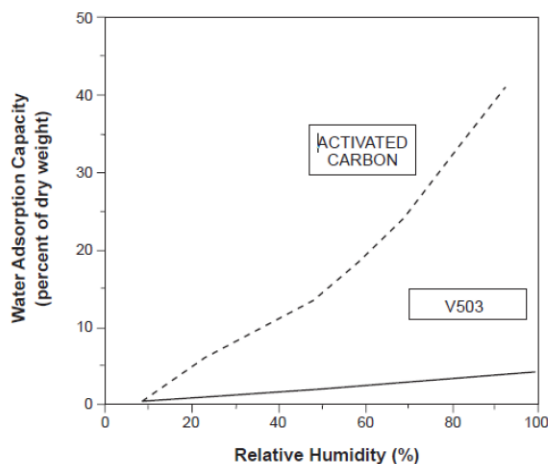
A typical moisture uptake for AmberSorb™ V503 Polymeric Adsorbent is shown in Figure 1. This product is produced with a patented chemistry to make it very hydrophobic. Low moisture uptake means that:

- water does not compete for adsorption sites that would reduce the resin's capacity
- energy is not wasted to desorb the water
- less water is subsequently recovered with the product solvent

AmberSorb™ V503 is available in dry form, ready to use for most applications. Since AmberSorb™ V503 is a powerful adsorbent, it may adsorb odors and solvents during transportation and storage. The adsorbent can be pre-cycled through a regeneration cycle prior to use to remove these materials.

Figure 1: Moisture Uptake

AmberSorb™ V503 Polymeric Adsorbent vs. Activated Carbon



Applications

- Removal of organics from humid air streams

Typical Properties

Physical Properties	
Copolymer	Styrene-divinylbenzene
Matrix	Macroporous
Type	Adsorbent
Functional Group	None
Physical Form	Tan to brown, opaque, spherical beads
Nitrogen BET	
Surface Area	~1100 m ² /g
Total Pore Volume	~0.94 cc/g
Average Pore Diameter	~34 Å
Chemical Properties	
Ionic Form as Shipped	Not applicable
Total Exchange Capacity	Not applicable
Water Retention Capacity	≤ 5%
Particle Size [§]	
Particle Diameter	850 – 1150 μm
< 300 μm	≤ 5%
Purity	
Ash Content	≤ 0.01%
Stability	
Whole Beads	≥ 80%
Friability:	
Average	≥ 1000 g/bead
Density	
Shipping Weight	340 g/L

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

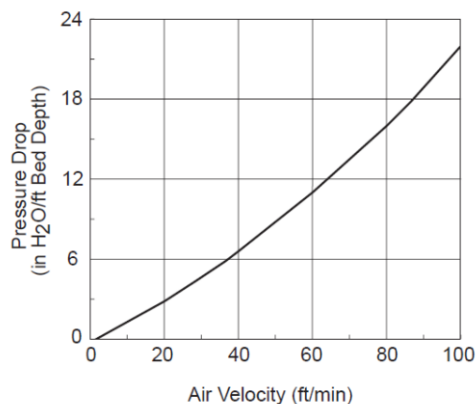
Hydraulic Characteristics

Estimated pressure drop for AmberSorb™ V503 Polymeric Adsorbent, as a function of air velocity, downflow through a packed bed, is shown in Figure 2.

For upflow applications AmberSorb™ V503 will begin to fluidize at an air velocity of 30 – 40 ft/min, depending on the bed depth.

Figure 2: Pressure Drop

AmberSorb™ V503 Polymeric Adsorbent
Fluid = Air



Application Information

Gas Applications using AmberSorb™ V503 Polymeric Adsorbent

AmberSorb™ V503 Polymeric Adsorbent exhibits high capacities for a variety of volatile organic compounds (VOC) and hazardous air pollutants (HAP). Some representative equilibrium adsorption isotherms obtained at ambient temperature are shown in Figures 3 – 6.

Figure 3: Equilibrium Adsorption Isotherm

AmberSorb™ V503 Polymeric Adsorbent
Vapor Phase: Perchloroethylene, Trichloroethylene, 1,1,1-Trichloroethane, Methylene chloride

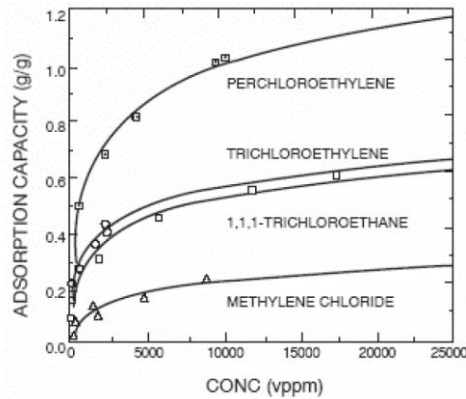


Figure 4: Equilibrium Adsorption Isotherm

AmberSorb™ V503 Polymeric Adsorbent
Vapor Phase: Toluene, Xylene

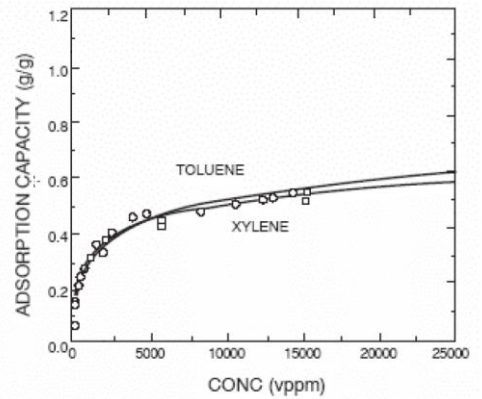


Figure 5: Equilibrium Adsorption Isotherm

AmberSorb™ V503 Polymeric Adsorbent
Vapor Phase: Methyl ethyl ketone, Acetone

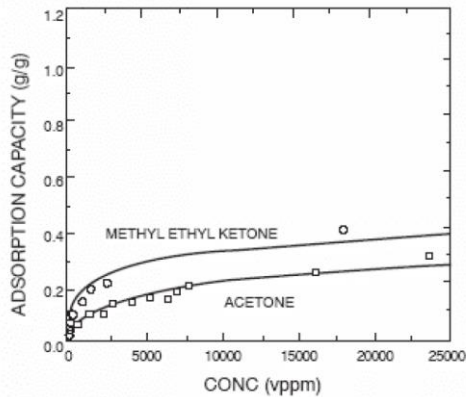
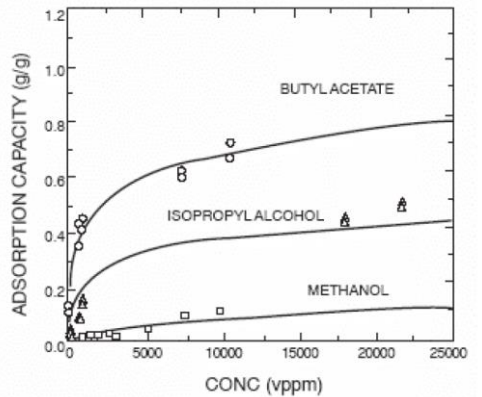


Figure 6: Equilibrium Adsorption Isotherm

AmberSorb™ V503 Polymeric Adsorbent
Vapor Phase: Butyl acetate, Isopropyl alcohol, Methanol



Application Information (cont.)

Catalytic Activity

In contrast to activated carbon, AmberSorb™ V503 Polymeric Adsorbent can be used to adsorb reactive solvents without catalyzing their decomposition. Reactive solvents such as acetone, methyl ethyl ketone, cyclohexanone, and styrene have been adsorbed and desorbed from AmberSorb™ V503 without measurable change in composition. With most activated carbons, however, measurable solvent degradation occurs. In extreme cases, solvent degradation on carbon beds can lead to an uncontrollable exotherm and a subsequent bed fire. The lack of catalytic decomposition when using AmberSorb™ V503 may be attributed to its extremely low mineral ash content.

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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.

Have a question? Contact us at:

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