



DOWEX OPTIPORE V503

Polymeric Adsorbent for Removal of Organics from Humid Air Streams

Features

Dow has commercialized a new product for capturing volatile organic compounds (VOC) from air. Designated as DOWEX* OPTIPORE* V503 polymeric adsorbent, this product replaces DOWEX OPTIPORE V502. The new adsorbent is a 1.0 mm diameter, spherical bead material, designed to give lower pressure drop in vapor phase applications while retaining all the other attributes of the smaller particle size adsorbent, DOWEX OPTIPORE V493.

DOWEX OPTIPORE V503 polymeric adsorbent is available in dry form, ready to use for most applications. Since DOWEX OPTIPORE V503 is a powerful adsorbent, it may adsorb odors and solvents during transportation and storage. The adsorbent can be precycled through a regeneration cycle prior to use to remove these materials. Table 1 lists typical properties for the adsorbent.

Table 1. Typical physical and chemical properties of DOWEX OPTIPORE V503 adsorbent

DOWEX OPTIPORE V503

Matrix structure	Macroporous styrenic polymer
Physical form	Orange to brown spheres
Particle size (mm)	1.0
Moisture content	<5%
BET surface area (m ² /g)	>1,100
Total porosity (cc/g)	0.94
Average pore diameter (Å)	34
Apparent density (g/cc)	0.34
(lbs/cf)	21.3
Ash content (%)	<0.01
Crush strength (g/bead)	>1,000

These properties are typical of the product and should not be confused with nor regarded as specifications.

Figure 1 shows a pressure drop curve for DOWEX OPTIPORE V503 adsorbent as a function of air velocity downflow through a packed bed. For upflow applications, DOWEX OPTIPORE V503 adsorbent will begin to fluidize at an air velocity of 30 to 40 ft/min, depending on the bed depth.

Low Moisture Uptake

Figure 2 shows a typical moisture uptake for DOWEX OPTIPORE V503. 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 and reduce capacity, energy is not wasted to desorb the water and less water is subsequently recovered with the product solvent.

Figure 1. Air pressure drop

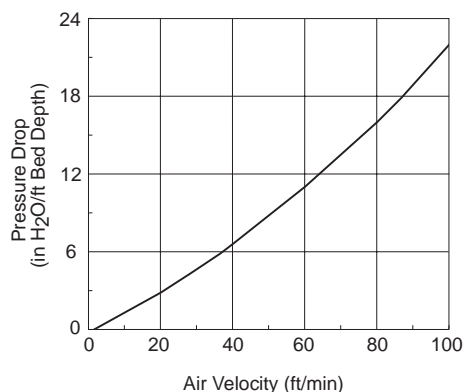
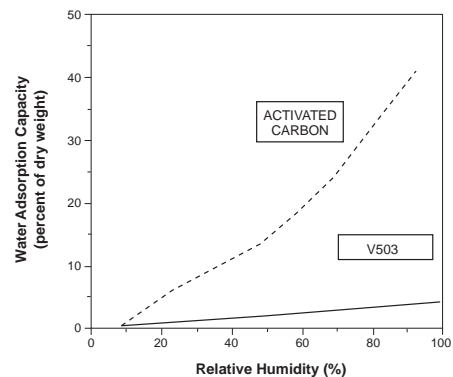


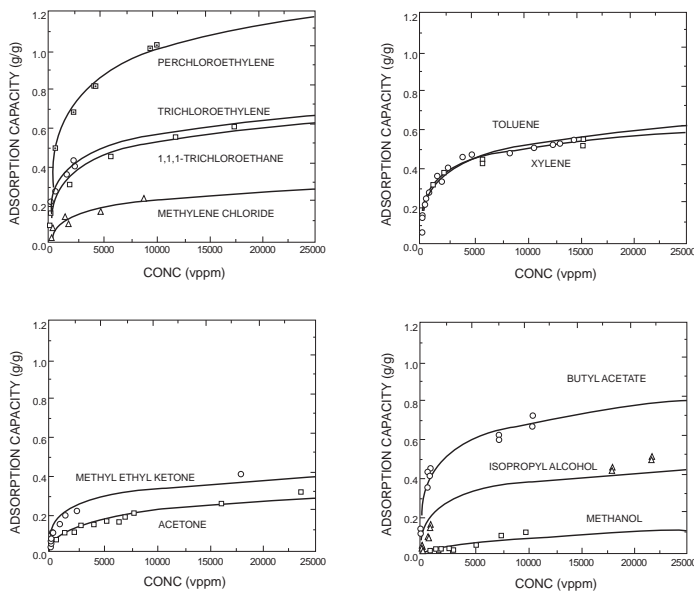
Figure 2. Moisture uptake for V503 and activated carbon



Catalytic Activity

In contrast to activated carbon, DOWEX OPTIPIRE V503 adsorbent can be used to adsorb reactive solvents without catalyzing their decomposition. Reactive solvents such as acetone, methylethyl ketone, cyclohexanone and styrene have been adsorbed desorbed 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 subsequent bed fire. The lack of catalytic decomposition when using DOWEX OPTIPIRE V503 adsorbent may be attributed to its extremely low mineral ash content.

Vapor Phase Adsorption Isotherms for DOWEX OPTIPIRE V503 Adsorbent



DOWEX Ion Exchange Resins
For more information about DOWEX resins, call the Dow Liquid Separations business:

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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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