



Graver Technologies

Filtration | Separation | Purification

## MetSorb™ HMRP 50 Micron Effective, High Value Adsorbent for Reduction of Heavy Metals

MetSorb HMRP adsorbent is a free-flowing powder designed for incorporation into pressed or extruded carbon blocks. The addition of Graver's MetSorb HMRP at relatively low levels to a carbon block design is very effective for the reduction of lead, and at higher HMRP usage levels effective for reduction of arsenic, to meet the requirements of NSF Standard 42. MetSorb HMRP utilizes a patented material to adsorb not only cationic lead species, but also both forms of Arsenic: Arsenic III and Arsenic V, present as (neutral) arsenite and (anionic) arsenate respectively. MetSorb HMRP will also reduce a wide range of other metal contaminants commonly present in drinking water or process water, and is effective in polishing low levels of metal contaminants from industrial waste streams.

### Recommended MetSorb HMRP Use

As a fine powder, the addition of MetSorb HMRP is recommended as a component of pressed or extruded carbon blocks, where heavy metal reduction is desired. In blending HMRP with carbon and poly binder components, one must assure that both the starting mechanical blend and the unfinished block produced appear homogeneous. The following guidance is provided as a starting point. The performance of each specific design should be evaluated as to reduction for the specific contaminant in question using industry-standard methodologies by qualified laboratories.

### Design Parameters for Improved Performance

A nominal 10-inch carbon block, standard for most counter-top and undercounter applications will provide more overall volume and more functional media than the 2 to 2 1/2 inch blocks typically used in end-of-tap (EOT) applications. For example, a nominal 10-inch carbon block can easily perform for 1000 gallons or more of contaminant reduction, while the smaller EOT blocks are rated at several hundred gallons.

The larger block design also gives longer contact times (EBCT or Empty Bed Contact Time) for better contaminant reduction. For example, a nominal 10-inch block will provide an EBCT of 10-15 seconds, while a typical 2 1/2 inch EOT block gives only 3 seconds EBCT.

Devices designed for slower flow rates, e.g., 0.5 gpm (gallons per minute) versus 1.0 gpm will provide longer contact times and better percentage contaminant reduction.



Use of higher concentrations of MetSorb HMRP will also improve heavy metal reduction efficiencies. Uniform dispersion of MetSorb HMRP in the carbon matrix is important for maximum performance.

MetSorb HMRP is thermally stable and nonorganic. It will not change characteristics, vent off-gases or odors or lose performance when used at typical carbon block processing temperatures. MetSorb HMRP would remain thermally stable when processed under these manufacturing cycle times or in general kept below 575°F (300°C.).

### MetSorb HMRP Adsorbent Specifications

MetSorb HMRP Powder	
Appearance	White powder
Moisture Content	<10%
Average Particle Size	< 50 microns
Other	Easily dispersed in carbon-poly binder matrix
Bulk Density	0.30 grams per cc
Bulk Density	20 pounds/cubic foot

## MetSorb HMRP Adsorbent Product Features/Benefits

Use of HMRP affords high capacity, excellent kinetics and a low level of competing ion interference. HMRP's adsorbent's adsorptive capacity for lead is high, so that low concentrations—typically between 5% and 10% can be used for nominal 10-inch carbon blocks, providing 1000 to 4000 gallons of performance. Higher concentrations of MetSorb HMRP will provide longer useful life and significantly lower effluent contaminant levels. Higher concentrations of MetSorb HMRP are also required for smaller carbon blocks typically used for EOT devices, because of reduced total volume and short contact time.

Performance of MetSorb HMRP is generally insensitive to pH—indicating no pH adjustment of influent water is required. Devices utilizing MetSorb HMRP will provide good performance regardless of geographic area and local water pH. MetSorb HMRP is very selective for lead in the presence of hardness ions, e.g., calcium and magnesium. Because of the rapid kinetics of lead reduction, use of MetSorb HMRP in small carbon blocks can provide EOT device design with contact times as short as three seconds.

### MetSorb HMRP Adsorbent is Safe

- MetSorb HMRP adsorbent is certified and listed under the NSI/NSF Standard 61 as a component of drinking water systems.
- Removals of heavy metals to meet drinking water standards can be achieved without adding contaminants.
- High adsorbent capacity requires less frequent cartridge handling and replacement.
- MetSorb HMRP will not “avalanche” lead or other contaminants.
- Spent cartridges have been determined to be non-hazardous and can typically be disposed of in a sanitary landfill as nonhazardous solid waste.

Since water influent quality and contaminants can vary, the user is urged to perform their own independent verification of the nonhazardous character of this spent product containing local contaminants. In addition, some states may have disposal criteria different from Federal guidelines (TCLP).

### HMRP Reduces Many Contaminants

- Lead
- Arsenic III and Arsenic V
- Mercury
- Selenium
- Cadmium
- Uranium
- Copper
- Zinc
- Chromium +6
- Antimony

### For more information

MetSorb HMRG Customer Service: **1-302-731-3516**

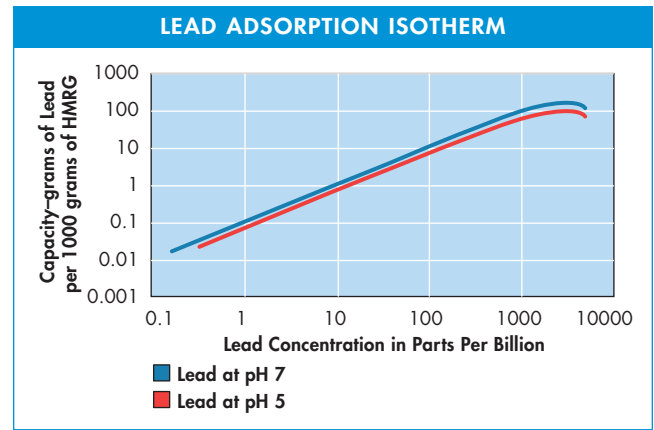


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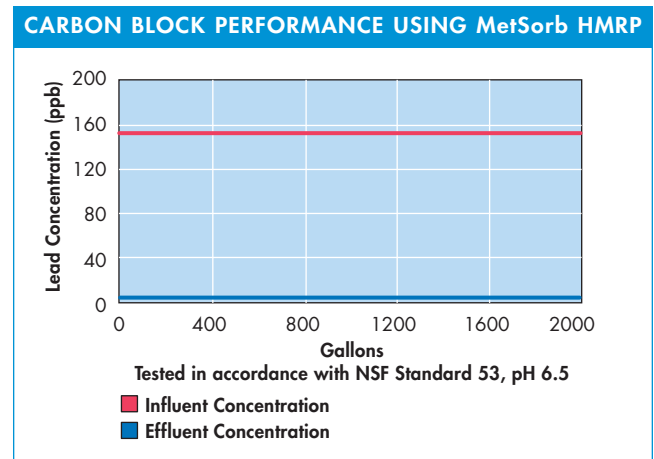
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The Adsorption isotherms for MetSorb's HMRP measured at both pH 5 and 7 are nearly identical, demonstrating lead reduction performance is insensitive to water pH.



The above chart demonstrates the effectiveness of MetSorb HMRP in reducing lead at 6.5 pH. Commercial applications of Graver's MetSorb adsorbent products have been certified under NSI/NSF Standard 42 for lead reduction, requiring performance at both 6.5 and 8.5 pH.

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The Authoritative Resource on Safe Water™

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