



Graver Technologies

Filtration | Separation | Purification

# MetSorb™ HMRG

## Effective, Low-Cost Adsorbent for Removal of Heavy Metals

**MetSorb HMRG** and HMRP adsorbents utilize a patented material to adsorb both forms of arsenic as well as a wide range of contaminants in water. Empty bed contact times as low as 10 seconds achieve high removal efficiencies. The material affords a higher capacity and a lower level of ion interference than competitive iron and alumina based products.

MetSorb HMRG media's adsorptive capacity is 220 grams of arsenic per kilogram of HMRG adsorbent at a pH of 7. It yields 40,000 bed volumes of capacity at an inlet concentration of 40 parts per billion (ppb) of arsenic, at 1.6 minutes of empty bed contact time EBCT, and a breakthrough of 10 ppb.

### Adsorbent Product Features/Benefits

- Removal of heavy metals to meet drinking water standards
- High adsorbent capacity requiring less frequent replacement
- Fast kinetics to work effectively at high flow rates
- Nonhazardous disposal as solid waste

### Contaminants

- Arsenic III
- Arsenic V
- Cadmium
- Copper
- Antimony
- Lead
- Mercury
- Uranium
- Zinc
- Selenium

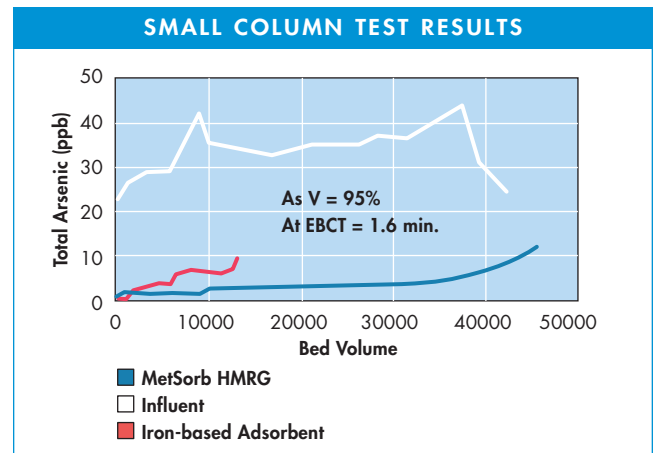
### Applications

- Commercial and industrial treatment units for drinking water or contaminated water
- Municipal water treatment
- Carbon blocks
- Cartridges for pitchers
- Faucet mounted and countertop devices
- Household point of entry treatment units



### MetSorb HMRG Adsorbent Specifications

HMRG Granular	
Appearance	White beads
Moisture Content	<10%
Bulk Density	0.65 grams per cc (40 lb/ft <sup>3</sup> )
Other	Free Flowing
Particle	-16/+60 U.S. mesh (other sizes available)

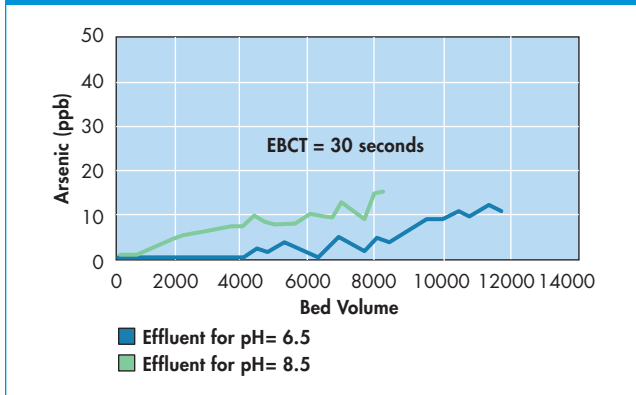


Comparison of HMRG adsorbent with iron-based adsorbent.

### BATCH TEST DATA-ADSORPTIVE CAPACITY MetSorb HMRG

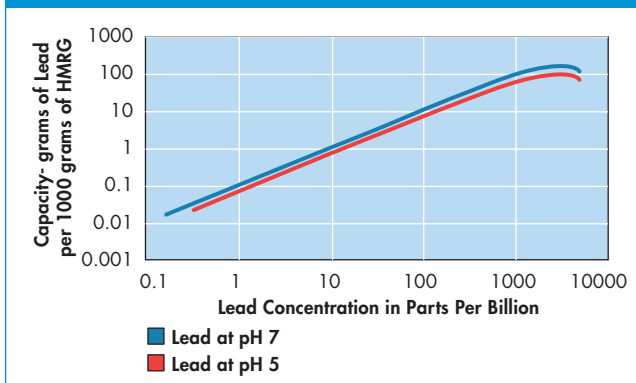
Metal	Initial Concentration	Final Concentration
Arsenic V	50 ppb	19-21 ppm
Arsenic III	50 ppb	12 ppm
Cadmium	1,000 ppb	24 ppb
Copper	500 ppb	5 ppb
Lead	1,000 ppb	18 ppb
Mercury	500 ppb	26 ppb
Zinc	500 ppb	12 ppb

### ARSENIC REMOVAL DATA - NSF 53



Testing was done under the conditions specified by the NSF Standard 53 for Arsenic. Results at a pH of 6.5 and a pH of 8.5 are shown in the graph above.

### LEAD ADSORPTION ISOTHERM



Adsorption isotherms for lead between pH 5 and 7 are nearly identical.



**Watertiger**

Tame Your Water

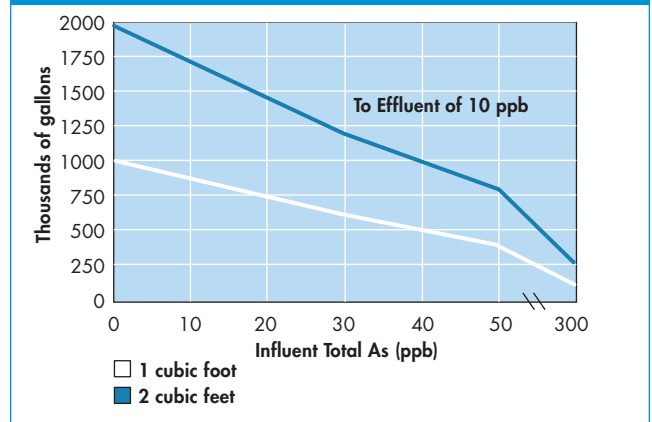


**Graver Technologies**

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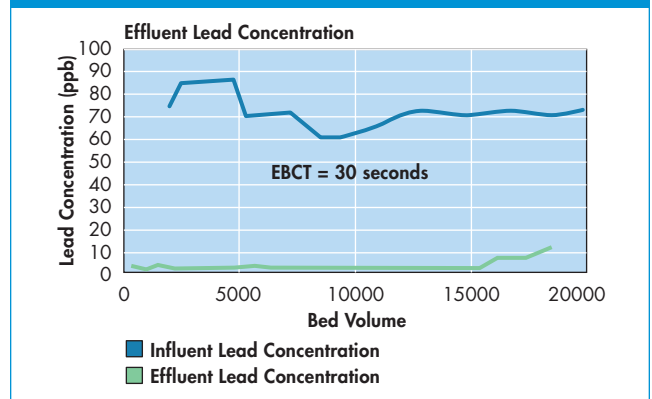
200 Lake Drive,  
Glasgow,  
DE 19702 U.S.A.

### ARSENIC TREATMENT CAPACITY VS. ARSENIC INLET LEVELS



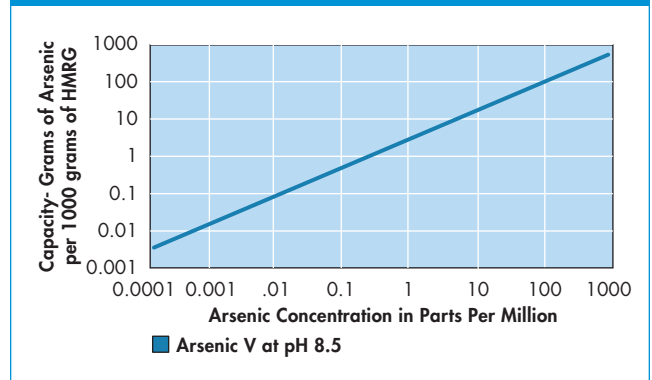
Treatment capacity as a function of tank size.

### LEAD REMOVAL COLUMN DATA



Lead removal by MetSorb HMRG adsorbent in column test; 30 seconds EBCT.

### ARSENIC ADSORPTION ISOTHERM



The above graph shows the adsorption isotherm for Arsenic V at pH 8.5. Isotherms for Arsenic III at pH 8.5, and for both forms of Arsenic at pH 4 are essentially identical.

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