



Graver Technologies

Filtration

Separation

Purification

MetSorb™ HMRG Provides Critical Heavy Metal Removal Performance for Bilge Water Treatment System

The Background

The discharge of accumulated waste water from the hull of Vessels (bilge water) has been exempt from the provisions of the EPA Clean Water Act for many years. Recent public and political pressure have resulted in the development of draft EPA standards to appropriately manage the bilge water, specifically from non-recreational vessels. Regardless of the EPA's official position, many environmentally responsible companies have been providing treatment for bilge water to avoid the direct discharge of recognized contaminants to the water body. Due to the varying composition of bilge water, this has presented significant challenges to both treatment providers and vessel owners alike.

The Problem

Bilge water is a mixture of several streams from operational areas on a vessel. Although the streams can vary in composition, some common contaminant characteristics are present in most bilge water streams.

The characteristics include:

1. Fuel, Oil, Grease (F.O.G.)
2. Heavy Metals (typically Zinc, Copper, Nickel, Chromium, Lead and Cadmium)
3. Surfactants (detergents, degreasers)
4. Suspended Solids (dirt, etc.)



Each contaminant characteristic requires an independent removal technique. Therefore, a multi-step treatment design is often required to effectively reduce the contaminant concentrations to acceptable discharge levels. Our specific application requires the removal of F.O.G, Surfactants, Suspended Solids and the heavy metals Nickel, Copper and Zinc.

For more information regarding Metsorb™ please contact:

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The Solution

A four-stage treatment train engineered for a treatment capacity of 200 gallons per minute was constructed, incorporating the Metsorb™ adsorbent media for heavy metal removal. The design consists of an Oil / Water Separator for removing available oil and grease. The addition of polymeric coagulants and flocculants is incorporated to provide for the rapid destruction of emulsified oils and efficient separation of solids. Particulate filtration, followed by adsorption with an organo-clay media for removal of residual petroleum compounds represents the third treatment sequence. The final step includes the installation of granular Metsorb™ HMRG adsorbent media in 5' diameter pressure vessels, for the adsorption of heavy metals including Nickel, Zinc and Copper.

The Results

The contaminant characteristics of the bilge water entering the treatment system varies routinely, however, the heavy metal contaminants are expected to be consistently removed to below the imposed discharge limitations:

	Bilge Water Concentration	Target Discharge Limits
Nickel	0.1 mg/l	< 0.01 mg/l
Copper	0.1 mg/l	< 0.01 mg/l
Zinc	0.02 mg/l	< 0.01 mg/l

METSORB™ HMRG is a highly effective granular adsorbent that removes Arsenic III & V, and a wide variety of heavy metals from aqueous sources.

Graver Technologies LLC designs, develops, and manufactures an array of specialty products for critical ion exchange, separation, purification, and filtration processes. We specialize in the purification of power generation condensate, process and drinking water, and industrial fluids and gases. Graver is a member of The Marmon Group (a Berkshire Hathaway Company), an international corporation with more than \$7 billion in annual sales. Around the corner or around the world, Graver Technologies is a fast-growing company with the technical resources and financial strength that make us the perfect partner for your business.

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