



Natural Gas Processing Bio-Reactor System

The Natural Gas Bio-Reactor System has been designed to remove siloxane, hydrogen sulfide, Thiols (Mercaptans) and Nitrogen related compounds from the natural gas well. The carbon bed filter system entraps all the unwanted natural gas contaminants while allowing all but a very small percentage <0.0003% of the methane to escape as cleaned gas.

After the carbon bed entraps the raw natural gas contaminants they are further delivered by rotation to a water bath area which is used to remove the natural gas contaminants from the carbon filter beds. This is a continual carbon bed washing operation, so future removal of the carbon bed filter is never required and the carbon may be in the active state for up to twenty years. The wash bath process stage is an area where the natural gas contaminants are subjected to a very specific grouped set of microbes to digest contaminants as a nutritional food source.

The natural gas flow passes thru the carbon bed filtration system and emerges as high quality methane gas, free of compromising compounds to the line compression system for transportation to the natural gas processing unit. By removing the sulfide, siloxane, thiols and any nitrogen compounds prior to the transportation line it lessens any associated wear on post treatment components such as gas compressors, monitors and many of the natural gas processing treating units.

Description

The Filtercrobe Bio-Reactor system is fabricated using stainless steel in the areas of direct exposure to the corrosive contaminants. The natural gas enters the first of many granulated carbon chambers where contaminants are trapped, after the contaminants are trapped the processed methane continues to exit the filtration system to the line compression station.

In the second phase of the filtration system, the carbon bed tower revolves within the stainless steel cylinder. As the cylinder rotates it passes a water bath which removes the contaminants from the carbon bed and processes these contaminants within the water bath area as nutrients to the selected microbes (food source). These microbes continually digest the contaminants. The only byproduct of the digestion is water and CO₂.

The microbial activity creates no sludge and requires no special wastewater treatment.

The microbial colony must be replenished twelve times per year. The cost associated with the microbial change out is \$150.00 per pound. Typical microbial amounts on a large 20000 scfm Filtercrobe system is two pounds. They are in a dry powder form and have a shelf life of up to five years. Changing the microbes requires less than one hour of employee time.

The filtration system operates with either pressure from the process line (4" w.g.) or a forced draft blower. The Filtercrobe system requires no fuel and only minimal amounts of electricity to operate the blower (if required) along with the cylinder rotating motor. The filtration system requires no down time, other than normal mechanical maintenance on the blower, should a blower system be required along with the small cylinder rotating motor.



The Filtercrobe system is able to eliminate the Hydrogen Sulfide, Siloxane, Thiols (Mercaptans) and Nitrogen compound by least 98%. Guaranteeing pure processed methane providing endless benefits to the owner/operator including reduced processing increased maintenance intervals and longer equipment life.

For every emission application the operation parameters are defined including the process temperature, microbial amount, differential gas pressure between the intake and outlet, and service time for adding the microbes in order to ensure that the system operates at optimal efficiency. The microbial wash basin is equipped with inspection windows to quickly verify the fluid level and the state of cleanliness.

The cylinder rotation motor and all other system parameters may be controlled via a programmable logic controller (PLC), if a facility requires a more controlled system. In addition, it is very easy to integrate into the ability to monitor and modify the operating parameters via Internet.

Conclusion

The carbon bed microbial natural gas bio-reactor system offers a low maintenance, low cost solution to the removal of natural gas contaminants. With superior efficiencies and simple patented design the Filtercrobe system offers years of reliable service at a small percentage of comparative equipment costs.

For more information about the [Filtercrobe® Bio-Reactor](http://www.american-environmental.us) or specific destruction efficiencies as it may relate to your specific emissions, please contact American Environmental Fabrication & Supply at www.american-environmental.us or call +1 918 708-1253. Representatives will be happy to discuss conversion of older technologies or new system applications.