

# CHOOSING GREEN TECHNOLOGIES BY CECO BENEFITS EVERYBODY

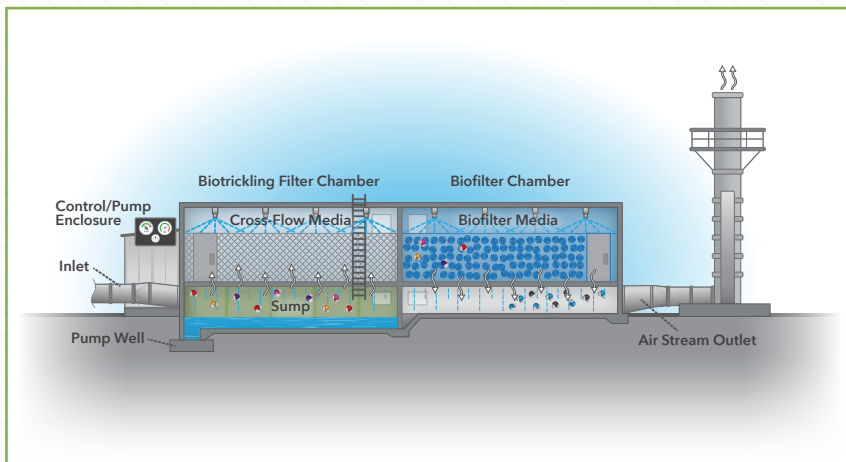
**CECO**  
ENVIRONMENTAL

HEE-DUAL  
BIO-PRO BIOFILTRATION

# WHAT IS BIOFILTRATION?

**Biofiltration is one of the greenest technologies available, protecting both people and the environment from harmful pollutants, such as corrosive gases and mists, hazardous air pollutants, process odors and more.**

The core function of biofiltration is the removal of contaminants from a gas stream using microorganisms to degrade the compounds via a biofilter. The contaminants are transferred into a biofilm—a combination of different microorganisms—designed to effectively eat the target compounds. Bio-oxidation occurs within the biofilm, after the volatile organic compounds (VOC) and odors are made available for degradation. They are then digested by the microbial population resulting in clean emissions from the biofilter.



**You have already taken an important first step to ensure your company goes green with your currently installed biofiltration system.**

**By going green you are meeting regulatory requirements with an efficient system that also protects the environment, as well as the communities you serve!**

# WHAT ARE THE ADVANTAGES OF CHOOSING GREEN TECHNOLOGIES BY CECO

**HEE-Duall Bio-Pro biofiltration systems, a CECO Environmental brand, is an industry leader in biofiltration systems and upstream equipment including: cyclones, venturi scrubbers, mist eliminators, duct, exhaust fans and hoods.**

CECO offers a range of solutions including Bio-Reaction Oxidizers (BRI) and the Bio-Pro system. These systems cover a diverse set of markets in air treatment including VOC or HAP abatement along with odor control applications. This umbrella of technologies allows us to offer you a wide spectrum of solutions for new and already installed systems.

**There are many benefits that set HEE-Duall Bio-Pro apart from the competition, including:**



## GREEN TECHNOLOGY

Not all air abatement products are created equal. CECO's biofiltration systems have been developed to minimize the environmental impact associated with emission remediation. Biofiltration systems are Green Technologies with the following key attributes:

- \ **Reduced NO<sub>x</sub> and CO<sub>2</sub> emissions**
- \ **Decreased fossil fuel usage through equipment and processes that are environmentally friendly and sustainable**
- \ **Optimized water flow rates and low air flow differential pressure for minimized energy requirements**
- \ **Low system maintenance and downtime to minimize emission diversions**



## LOW TOTAL COST OF OWNERSHIP

CECO products and solutions are designed to be earth-friendly, while offering a low cost of ownership—from capital expenditures to maintenance costs. CECO prides itself on not only offering earth-friendly products but does it at a cost that fits your budget. This low cost of ownership stems from numerous factors including equipment life and efficiency, preventative maintenance programs and services like media replacement, among others.



## EQUIPMENT LIFE AND EFFICIENCY

Working closely with CECO, you can rest assured that your system will be monitored and maintained properly and efficiently, providing cost savings as a result of our comprehensive preventative maintenance packages.



# IS YOUR BIOFILTER AGING AND IN NEED OF SERVICING?

**Keeping your biofilter updated will help you combat media plugging, flow channeling and other related equipment failure as a result.**

CECO Environmental offers biofiltration system audits and replacement media services for biofilter products to extend your biofilter's life and optimize performance. Rather than purchase a new biofilter system, CECO can remove the old media bed and replace it with a new one designed around your specific requirements, such as flow rate, emission type, permit restrictions and operational considerations, among others.

**CECO Environmental is able to provide an entire lineup of biofilter media options, including:**

- \ Biotrickling Media
- \ Organic Biosphere Media
- \ PUF Foam Media
- \ Random Packing
- \ Lava Rock and Alternatives

**Our goal is to get your system operating efficiently and working as originally commissioned with your permitting compliance requirements.**

**When this is accomplished, you will not have to go through a re-permitting process for changes outside of the original design.**



# HOW DO I KEEP MY BIOFILTER IN OPTIMAL OPERATING CONDITION?

There are a variety of preventative maintenance options for you to choose from.

Working with our team of environmental experts, we can design a program that is right for your specific needs. We partner with you to provide assistance with managing repairs and asset failure.



## Preventative maintenance

With the right preventative maintenance, you can:

- \ Reduce unexpected shutdowns caused by equipment breakdowns
- \ Identify the proper time to replace media to extend the life of your biofilter
- \ Ensure optimal performance, operational efficiency, and regulatory compliance through CECO's engineering consultation services

Bi-Annual (2x Per Year)  
On-Site System Audits

Monthly System  
Reporting

CECO Connect – Remote  
Monitoring Services

Analytical Sampling  
and System Testing



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**CECO’s line of biofiltration products have been tested under the harshest environments and continue to prove reliable, efficient and truly give customers a low cost of ownership.**

**I’m proud to continue to support CECO in its efforts to help companies achieve cleaner air emissions from their industrial applications—especially in a ‘green’ fashion.**

**- Dr. James Boswell**

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**CECO has a fundamental mission to protect the environment, have a diverse, equitable and socially responsible workforce, and govern ourselves in the most ethical and appropriate ways possible.**

This is our continued journey to live out our environmental, social and governance (ESG) ambitions and goals. This is our purpose: to protect our communities through diverse and inclusive teams that practice ethical and safe solutions.

**Dr. James Boswell, is a member of the original team that developed and patented the basic design in use today. Currently he is a consultant at CECO Environmental.**



## WHY CHOOSE CECO?

**With more than 40 years of industry experience, CECO HEE-Duall is the total provider of solutions unique to your needs. Whether it is system design, engineering and construction, system start-up, maintenance or replacement media; CECO has you covered.**

We use a consultative approach to review, design and fabricate equipment tailored to your specific needs, as well as provide installation for start up and commissioning of your equipment.

**Our solutions extend beyond the product offerings and include:**

\ **Parts and accessories**

\ **Repair services**

\ **Retrofits**

\ **Assessments**

\ **Training**

\ **Remote Monitoring**



## DOES CECO OFFER NEW INSTALLATIONS?

**CECO has the deep expertise in engineering and design to handle a variety of new installations for your company.**

Across our wide-array of solutions, we offer everything from in-vessel designs utilizing FRP and thermoplastic materials to systems that are constructed of concrete (installed both above grade and in-ground). CECO new installations provide you with the broadest air pollution control options currently available on the market.



# WHAT MEDIA TYPES DOES CECO OFFER?

**CECO Environmental has operational experience with a broad range of biofilter media types.**

With many solutions available, we can identify the right solution for your air abatement challenge. We select media based on the emission application, the required removal efficiencies, and operational requirements.

## Media types include:



### BIOAIRSPHERES

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proprietary media designed for biofiltration applications



### BIOAIRSPHERES ORGANIC MEDIA

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integrated organic material enhances biological growth while preventing bed compaction



### BIOTRICKLING MEDIA

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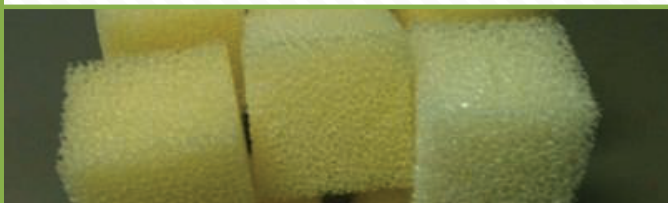
for biotrickling filter applications that maintain a high efficiency to reduce operating costs



### RANDOM PACKING

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a low pressure drop media suitable for odor control systems



### PUF (POLYURETHANE FOAM)

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a porous, low density synthetic media used in applications requiring high porosity and large surface area.



### LAVA ROCK

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for odor control systems at wastewater treatment facilities.



# WHAT INDUSTRIES DOES CECO SERVE?

CECO works with companies across a multitude of industries, including but not limited to:

- \ Engineered wood (OSB, MDF, particleboard, etc.)
- \ Paint and coatings
- \ Chemical manufacturing
- \ Pharmaceutical
- \ Semi-conductor and solar
- \ Food and beverage
- \ Bakeries, processing/packaging
- \ Rendering, brewing/distilling
- \ Automotive
- \ General industrial applications

To learn more about these total solutions to improve the industrial air quality for your business, contact:

**GEORGE BAEHR**

CECO Filters, HEE-Dual



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