



## Other CECO Technologies

CECO Environmental also operates in two other segments:

### ENERGY SOLUTIONS

CECO Environmental offers a broad range of effective technologies for the gas-fired and solid fuel power, midstream natural gas pipeline, refinery, and petrochemical industries.

- Peerless brand Liquid / Gas Separators
- Emtrol-Buell brand Fluid Catalytic Cracking Units (FCC Cyclones)
- Aarding brand Natural Gas Turbines Exhaust Systems
- Peerless brand Selective Catalyst Reduction (SCR) for NOx reduction
- Burgess-Manning and Aarding brand Silencers
- Aarding and Effox-Flextor brand Dampers / Diverters
- Zhongli brand Ball Mills
- Effox-Flextor brand Expansion Joints — Composite and Non-Metallic

### FLUID HANDLING SOLUTIONS

CECO Environmental offers a broad range of single-stage centrifugal pumps and filtration products and solutions for high-temperature, corrosive, and abrasive liquids.

- Dean Pump brand Chemical Process and High-Temperature Pumps
- Fybroc brand Fiberglass Reinforced Plastic (FRP) Pumps
- Sethco brand Corrosive-Resistant Thermoplastic Pumps
- Mefiag brand Filters for Electroplating
- Mefiag brand Carbolux Industrial Electrolyte Separation

# Air Quality Solutions & Services

Backed by the industry's most technically skilled staff with more than 40 years experience servicing and maintaining our HEE-Duall brands

1172 South M-13, Lennon, MI 48449  
4222 East La Palma Avenue, Anaheim CA 92807  
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CECO is a global leader in Air Quality and Fluid Handling Solutions that develops and delivers leading technologies, services, and solutions for air quality and fluid handling applications.

CECO serves customers in industries ranging from power generation to mid and down stream energy to a wide variety of manufacturing segments. Our products play a vital role in helping companies achieve exacting production standards, meeting increasing plant needs and stringent emissions control regulations around the globe.

We work with our customers to achieve their operational goals while protecting our shared environment to create a sustainable future for generations to come. We do this by helping companies grow their business with clean, safe and more efficient solutions that help protect our shared environment.

CECO is listed on Nasdaq under the ticker symbol "CECE."  
For more information, please visit [www.cecoenviro.com](http://www.cecoenviro.com).

## CECO HEE-Duall

CECO HEE-Duall is the merged entity from Harrington Environmental Engineering and Duall Air & Water.

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## HOODS, DUCTING, AND MIST ELIMINATORS

### FEATURES

- Mist Miser® Vertical Mist Eliminator – 99% efficient at hood outlet
- ME Horizontal Mist Eliminator – Low energy Chevron blade design

### TYPICAL APPLICATIONS

- Alkaline mists
- Caustic cleaners
- Caustic soda
- Chromic acid
- Clean Room Hoods
- Cyanide mist
- Fluoborate mist
- Nickel sulfate
- Phosphoric acid
- Sodium hydroxide
- Sulfamate mist
- Sulfuric acid
- Oil Mists



Corrosion Resistant PVC and FRP Construction

Hoods, Duct and Push Air System



HPE300 Mist Eliminator

## HEXMASTER / HEPA-HEX ULTRA-EFFICIENT MIST ELIMINATORS

### FEATURES

- EPA performance tested and guaranteed
- Single composite mesh pad system with HEXTRACK for no by-pass
- Lowest pressure drop CMP system for energy and maintenance savings
- Fastest payback in the industry
- Quick release knobs for easy CMP removal
- Low water requirement wash down
- HEXmaster® 3 stage “dry” scrubber — can be upgraded to wet scrubber in the future
- HEXmaster® and HEPA-HEX systems meet most recent EPA federal emission standards for Hexavalent chrome while providing the lowest energy usage

### TYPICAL APPLICATIONS

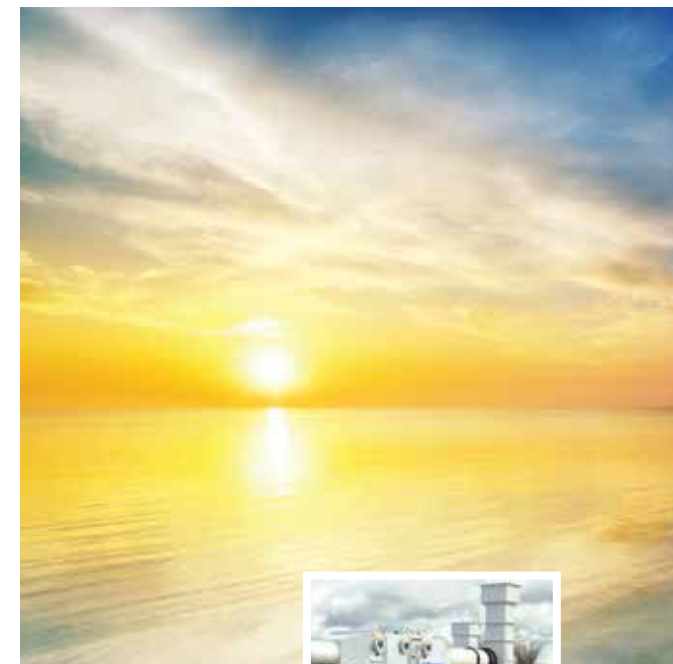
- Hard Chrome Plating and Anodizing
- Battery wet and dry charging
- Printed circuit fabrication
- Electrolytic nickel
- Part Washing Systems

### TYPICAL CONTAMINANTS REMOVED

- Chromic acid
- Sulfuric acid
- Nickel
- Cyanide
- Phosphoric acid
- Alkaline



HEXmaster® Mist Eliminator System



HEPA-Hex™ Mist Eliminator System



**PACKED BED SCRUBBERS —  
PVC AND FRP CONSTRUCTION**

**BETA NO<sub>x</sub> 2000® SCRUBBERS  
(FOR NO<sub>x</sub> CONTROL)**

Vertical Scrubbers



**FEATURES**

- Horizontal & Vertical

**HORIZONTAL SCRUBBER**

- Cross Flow
- Low Profile
- Easy Access

**VERTICAL SCRUBBER**

- Counter Current Flow
- Minimal Footprint

**TYPICAL APPLICATIONS**

- Metal finishing
- Industrial and municipal wastewater
- Foundries
- Pharmaceutical
- Medical
- Food processing
- Rendering
- Tanning
- Breweries
- Printed circuits
- Semi-conductors
- Chemical
- Others
- Fertilizer Manufacturing, Pulp & Paper, Rubber and Synthetics

Horizontal Scrubber



Beta NO<sub>x</sub> 2000® Scrubbers (Multi-Stage)

**FEATURES**

- > 99+% removal efficiency on total NO<sub>x</sub>
- Guaranteed performance
- Single or multi-stage configurations available
- The safest oxidation / reduction technology
- Corrosion resistant construction
- Eliminates visible red NO<sub>x</sub> plume
- Complete turnkey systems available

**TYPICAL APPLICATIONS**

- Aluminum anodizing and bright dip
- Precious metals refining
- High alloy steel etching
- Chemical nitration



Beta NO<sub>x</sub> 2000® Scrubber (Single Stage)



## ADJUSTABLE THROAT VENTURI SCRUBBERS

### FEATURES

- Exceptionally high collection efficiencies well into sub-micron particle ranges
- Non-clogging, adjustable throat optimizes particle collection and operating efficiency
- Wetted wall inlet prevents solids build up and extends scrubber service
- Liquid atomization and particle impaction entrap dirty gas contaminants
- Cyclonic entrainment separator removes and collects wetted dust particles
- Corrosion resistant thermoplastic, fiberglass, and metal alloy construction
- Pre-engineered designs to 40,000 cfm

### APPLICATIONS

Ideal control technology for nuisance and hazardous particulate matter (PM 2.5) emitted from:

- Industrial boilers and furnaces
- Biomass combustion and exhaust streams
- Mining and Minerals crushing and processing
- Chemical process reactors
- Steel making and manufacturing
- Coal and Fly Ash emissions

### Provides Product Recovery for:

- Food and Beverage applications
- Pharmaceutical powders
- Precious Metals Refiners

## EMERGENCY GAS AND POINT-OF-USE SCRUBBERS

Compact, highly efficient scrubbers designed for vapor deposition reactors, cylinder cabinets, chemical storage tanks, gas scrubbing, low volume exhaust and hot gas/quench applications.

### FEATURES

- Ideal for particulate and toxic gas removal
- Flow rates to 5,000 CFM in standard models
- Skid mounted
- Stationary or portable installations

### ADVANTAGES

- Available as eductors without fans or packed bed scrubbers with fans
- Combine the particulate removal and gas moving features of an eductor with the gas absorption quality of a packed tower



Venturi Scrubber System  
Treating Emissions from an  
Industrial Furnace



Manual throat adjustment permits variable pressure settings while unit remains in operation.



Liquid atomization in the high velocity zone maximizes particle impaction and capture of gas stream pollutants.



ET Series Multi-stage ejector tower toxic gas scrubber



ET Scrubber system with integral containment for Hydrazine





## BIOLOGICAL TRICKLING FILTER SYSTEMS

The BIO-PRO® technology has been engineered to meet the needs of systems ranging from 50 ACFM to as large as 500,000 ACFM. In addition to in-vessel designs utilizing FRP and thermoplastic materials, we have installed systems that are constructed of concrete. Concrete systems have been installed both above grade and in-ground. Our engineering and design capabilities provide our customers with the broadest air pollution control options currently available.

### BIOLOGICAL SYSTEMS FOR MULTIPLE APPLICATIONS:

MUNICIPAL  
ODOR CONTROL

ENGINEERED  
WOOD

### FEATURES

- Green technology — no chemicals required
- Pre-humidification and heater systems
- Low power consumption
- Easy feed nutrient system — requires no power
- Optional mixed flow fan
- Compact design

## INDUSTRIAL & MUNICIPAL ODOR CONTROL SYSTEMS

### PACKAGED PTMD SCRUBBERS

#### FEATURES

- Pre-engineered systems up to 25,000 CFM
- Compact, economical skid-mounted design
- Complete with proportional chemical feed system
- Low-profile, easy access design
- Heavy-duty, industrial grade construction
- Meets strict seismic and wind load requirements without the need for expensive guy wires

#### APPLICATIONS

- Municipal waste treatment
- Chemical processing
- Pharmaceutical fermentations
- Coating processes
- Storage tanks
- Compost facilities
- Fish and poultry processing
- Pulp and paper manufacturing
- Reactor vents
- Food / spice processing
- Animal rendering
- Paint stripping
- Drying processes
- Breweries



Biofilter Removing Hazardous Air Pollutants (HAPs)



BIO-PRO® Biotrickling Filter



Biotrickling Filter Removing Odors

BIO-PRO® Biotrickling Filter

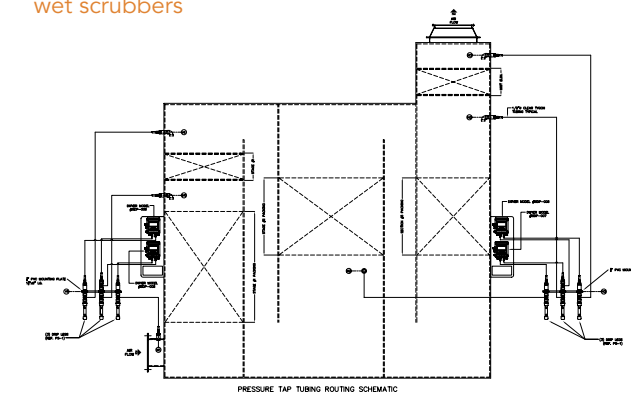
BIO-PRO® Bio-SumpVent™



Self-Contained Chemical Feed Skids



Multi-stage combined wet scrubbers





**INDUSTRIAL & MUNICIPAL  
ODOR CONTROL SYSTEMS**

**HYDRO-LANCE® WET DUST  
COLLECTION SYSTEMS**

**ACTIVATED CARBON SYSTEMS**

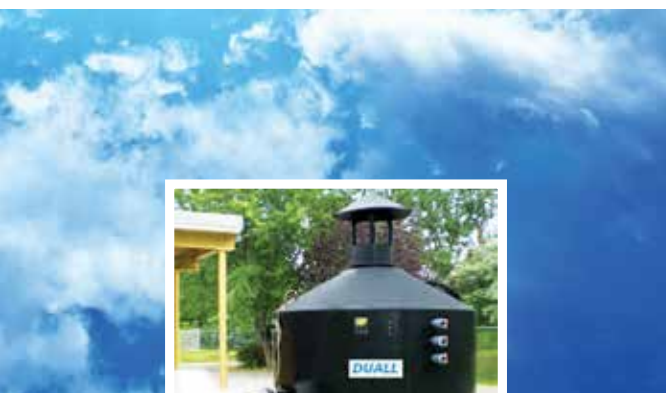
- Skid-mounted systems up to 2,500 CFM
- Custom designed single and dual bed systems
- Custom designed cross flow systems to 40,000 CFM

**ADVANTAGES**

- Low maintenance
- Ideal for H2S and organic odor control
- Low pressure drop
- Space Saving Minimal Footprint
- FRP, PVC, and PP Construction



CA Series Dual Bed Carbon System



Carbon Canister with Integral Fan



CA Series Single Bed Carbon System



HLFW Series Hydro-Lance® Particulate Scrubber with Integral NH Fan

**HYDRO-LANCE®  
VENTURI SCRUBBERS**

- Capital cost — simple economical design
- Replacement costs — corrosion resistant construction provides extended equipment life
- Energy — recirculation pumps are not required
- Maintenance — no moving parts, spray nozzles or recirculation piping
- Floor space — efficient geometry
- Water — the sump liquor need not be diluted



**FEATURES**

- > 99+% high efficiency design
- Low energy vs conventional venturis
- Ideal for potentially explosive applications
- Ideal for humid sticky particulate
- Pilot scrubber available for site testing
- Replaceable Venturi throat
- Custom CIP wash headers available
- Corrosion resistant construction
- Complete turnkey systems available

**APPLICATIONS**

- Aluminum, titanium and other metal machining operations
- Sodium Azide propellant manufacturing and handling
- Pharmaceutical powders and dusts
- Calcium chloride dusts
- Hygroscopic dusts
- Corrosive dusts
- Food processing with clean in place (CIP) option
- Bulk solids drying process
- Battery lead pasting
- Breweries

**IDEAL FOR EXPLOSIVE DUSTS!**



## DEGASIFIERS & AIR STRIPPERS

Model ST degasifiers remove volatile organic compounds (VOCs), MTBE, Hydrogen Sulfide (H<sub>2</sub>S) and CO<sub>2</sub> found in groundwater supplies, industrial wastewaters and process effluents. Each system is computer-designed from an extensive data base. On-site testing is utilized when necessary.

### ADVANTAGES

- Non-fouling, energy saving, proprietary weir trough design maximizes liquid distribution at minimal discharge pressure thus eliminating water hammer problems
- Materials are NSF (National Sanitation Foundation) approved
- Optional carbon absorbers and biological systems for polishing are available when required
- Skid mounted low profile systems available



Water Production Plant with Degasifiers

## DUALLAST® FRP CONSTRUCTION



DUALLast® Degasifiers, Scrubbers, Fans, and Stacks

### FEATURES

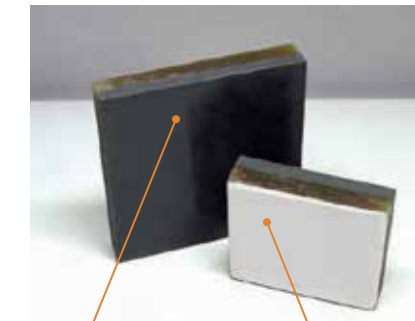
- Inner PVC layer up to 1/2" thick (500 mils vs. standard 20 to 50 mils)
- Inner layer can be spark tested to insure leak-proof construction
- Inner layer not subject to costly wicking and crazing failures
- Structural designs up to 150 mph windload
- FRP shell formulated to provide maximum UV protection
- NSF tested and certified

### APPLICATIONS

- All corrosive ventilated air streams
- Food grade and potable water applications — NSF approved
- Highly corrosive environments such as hypochlorous acid and chlorine dioxide

### The Most "Cost-Effective" Material Offering The Best Advantages Of Both FRP And Thermoplastics

- Superior corrosion barrier extends service life
- Maximum structural integrity



PVC Corrosion Barrier

FRP Exterior



## FIBERGLASS AND THERMOPLASTIC CENTRIFUGAL FANS

### CORROSION RESISTANT EXHAUST FANS

All of our fan lines are manufactured using premium fiberglass and thermoplastic materials, along with globally-known and accepted components such as motors and bearings. With fans ranging in airflows from 500 to 165,000 cfm, and static pressures up to 20+ inches w.g., HEE-Duall has a fan to meet your needs.



HEE-Duall offers a wide selection of corrosion-resistant centrifugal fans to handle even the most difficult applications.

### ADVANTAGES

HEE-Duall has been manufacturing centrifugal exhaust fans since the early 1970's. Since that time, we have continued to improve our product to meet the increasing need for high quality, corrosion resistant, reliable exhaust fans.

HEE-Duall currently manufactures four types of fans: centrifugal, inline centrifugal, radial and laboratory models. Each Individual design has been engineered and refined to offer maximum performance with options to meet the demanding conditions in today's industrial applications.

- PVC and PP
- FRP

### APPLICATIONS

- Semiconductor manufacturing
- Circuit board manufacturing
- Chemical manufacturing & processing
- Metal plating & finishing
- Rubber and synthetic manufacturing
- Fertilizer manufacturing
- Power plants
- Pulp and paper operations
- Waste treatment facilities

## HPCA AND HPIA AIR FOIL FANS

### FEATURES

- AMCA certification guarantees specified performance
- Maximum Class III rotational speeds without distortion or bond separation
- Capable of static pressures up to 18+” w.g.
- Static efficiency ratings up to 83%
- 8 different discharge positions
- Standard arrangements are 1, 8 (direct coupled) and 9, with others available.
- Factory balanced to ASTM specifications.
- Premium quality materials and components.
- Capacities up to 165,000 cfm

HEE-Duall has continued its tradition of excellence with development of the only true fiberglass airfoil fan on the market today. We have dedicated thousands of hours to the development and refining of our airfoil wheel, which is the heart of our fan. Manufactured from premium quality resin and glass, with a lightweight, high density interior, our airfoil wheel offers the ultimate in performance and economical operation. Fans are available in sizes up to 73 inches in diameter. When considering performance our fans are of the highest quality and they are finished to reflect the care we take building them to your specifications. Quality performance and workmanship assure that all of our fans will provide you with many years of reliable service.





**Make us your new pollution control service partner. Then relax... We'll take care of it!**

We provide innovative solutions and a diverse line of products and technologies for the purification of air, and the destruction of volatile organic compounds (VOCs), hazardous air pollutants (HAPs), water contaminants, and process odors in both industrial and municipal applications.



HEE-Duall offers an experienced single source for servicing and maintaining all of your air pollution control equipment, regardless of the manufacturer.

We provide the best technical solutions to address the multiple areas of your process.

**SERVICES INCLUDE:**

- Assessments
- Preventative Maintenance
- Inspection
- Installation
- Troubleshooting
- Repair and replacement
- Rebuilds
- Fan balancing
- Equipment relocation
- Performance improvement
- Catalyst replacement
- Site studies



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