



FOCUS ENVIRONMENTAL, INC.

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Combustion, Thermal Treatment, & Air Pollution Control Engineering Capabilities

OVERVIEW

Focus personnel have extensive experience in the design, evaluation, and operation of combustion systems and associated air pollution control equipment



for our clients. This capability extends to virtually all kinds of processes and air pollution control equipment. Hands-on

experience enables us to very effectively evaluate and recommend alternative/comparable energy sources as well as troubleshoot combustion problems and air pollution control equipment.

Focus has experience with the following combustion equipment applications:

- Hospital / Medical / Infectious Waste Incinerators (HMIWI)
- Hazardous Waste Combustors (HWC)
- Aggregate and Cement Kilns
- Halogen Acid Furnaces
- Industrial Boilers
- Low Temperature Thermal Desorbers
- Commercial / Industrial Solid Waste Incinerators (CISWI)
- Municipal Waste Incinerators
- Sludge Incinerators

Technology Assessments

With our strong process and regulatory background, Focus engineers are well suited to perform technology assessment studies for energy consuming process systems. Our engineers conduct studies for energy efficiency, throughput optimization, increased operational capacity, use of alternative fuels, and emissions impacts. Focus engineers design and

evaluate fans, ductwork, hooding, and general air handling systems.

Emissions Estimates and Waste Characterization

Focus engineers have extensive experience estimating emissions from processes including estimation of removal efficiencies across various types of air pollution control systems using both theoretical and real world estimation techniques. Focus maintains a stack testing database to verify emissions estimates generated for specific applications. These estimates form the basis for air permit applications and design.

For the proper design of any treatment system, an accurate accounting of all process inputs is an essential requirement. Focus has developed special expertise and engineering analytical tools to ensure emissions and wastes are adequately characterized, categorized, and inventoried.

Technology Assessments
Emissions Estimates and Waste Characterization
Emission Control Systems Engineering
Energy Savings Calculations
Process Modeling
Operator Training

Emission Control Systems Engineering

Emission control systems must be engineered to capture before they can control. Focus engineers understand control techniques, capture velocities, and hooding configurations necessary to capture hot, buoyant plumes, hazardous gases, abrasive dusts, etc. We engineer emission control systems starting at the point of capture, through the hood, the adjoining ductwork, the many transitions, the control device, the fan, and the exhaust. We ensure pressure loss, material abrasion, material consistency (wet or sticky), and conveying velocity are taken into account. Relevant applications include particulate collection, mercury and other metal controls, acid gas scrubbing, organic emissions controls, and nitrogen oxide (NOx) emission controls.

We work with the following air pollution control equipment:

- Carbon adsorption systems
- Cryogenic Condensers
- Coolers / Chillers / Condensers
- Quench chambers (full & partial)
- Venturi scrubbers
- Spray dryers
- NOx control technologies
- Dry sorbent injection
- Cyclones
- Baghouses / fabric filter
- Cartridge filters
- Packed and spray scrubbers
- Ionizing wet scrubbers
- Free jet scrubbers
- Electrostatic precipitators (dry & wet)
- HEPA filter
- Oxidizers
 - Catalytic
 - Recuperative
 - Regenerative
 - Direct fired.

Energy Savings Calculations

Focus engineers conduct mass and energy balance calculations identifying the sources and potential drains on energy from a system, particularly thermal oriented systems. We use this knowledge and understanding to reduce energy losses and apply effective energy recovery techniques.

Alternative Fuel Evaluations

Alternative fuel sources can be a very effective way of reducing operational costs for a production facility. Focus engineers have the knowledge and experience to evaluate the feasibility of using alternative fuel sources and making sure that the modification does not cause other problems that would need to be addressed.

Process Modeling

Focus has developed an integrated system of proprietary process computer modeling programs to use in designing and evaluating a wide variety of combustion, air pollution control, and general chemical processing technologies. Focus in-house process engineering models include the following, among others:

- Combustion system mass and energy balance model (CMEB)
- Air pollution control system mass and energy balance model (AMEB)
- Plume suppression mass and energy balance model (PLUME)
- Process vent system model (VENT)
- Quench chamber residence time model (QUENCH)

Focus has other models used for estimating process air emissions, fugitive emissions from contaminated soil, and air dispersion. Focus also licenses a number of other process modeling software packages for specific unit operations such as packed column design. Focus can create spreadsheet models for other processes to support optimization, troubleshooting, or upgrade design projects.

Operator Training

Focus developed and delivered a qualified operator training program for operators of hazardous waste combustors under in accordance with an American Society of Mechanical Engineers (ASME) program. Although the program is no longer offered under ASME, Focus has knowledge and experience to develop and deliver site specific training for operators, supervisors, and managers to meet regulatory compliance.

COMPANY PROFILE

Focus Environmental, Inc. (Focus) is an employee-owned environmental engineering consulting firm located in Knoxville, Tennessee. Focus specializes in providing engineering and regulatory compliance services for applications involving combustion, waste treatment, and emissions control equipment. Examples of equipment for which Focus has provided services include hazardous waste incinerators, boilers, industrial furnaces, thermal desorbers, glass furnaces, aluminum furnaces, and cement kilns. These services include process engineering, operations support, regulatory compliance support, regulatory compliance testing, and general industrial regulatory compliance support. Focus also supports fixed-based industrial facilities and transportable units used for the thermal remediation of contaminated soils and sediments.

FOCUS HISTORY

Focus was established in 1988 and has successfully completed over 1,500 projects for more than 400 clients in the chemical, petrochemical, pharmaceutical, explosives, ammunition, metallurgical, biomedical, automotive, textiles, minerals, aluminum, and waste management service industries. In addition to work in these industrial sectors, a number of projects have been completed for site remediation contractors, utilities, and government agencies. These projects have been conducted throughout the United States in all 10 EPA regions, located in 47 states, and internationally in

21 countries.

DEMONSTRATED PROFESSIONAL QUALIFICATIONS

We offer our clients a unique blend of technical expertise, regulatory compliance insight, and practical hands-on operating experience. Focus staff includes experienced engineers and scientists with degrees in chemical, civil and environmental engineering, and in environmental science. All of Focus' engineers hold either PE or EIT certifications. Focus' senior principals average over 30 years of experience in the environmental field.

Please contact us if Focus can assist you with your compliance requirements.



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