ENVIRONMENTAL
COMBUSTION TECHNOLOGIES

PRODUCT BROCHURE

SUREFIRE
INCINERATORS

SUREFIRE
ENERGY FROM WASTE

Reliable. Efficient. Sustainable.

www.ectechltd.com

INTRODUCTION

SUREFIRE
INCINERATORS

WASTE INCINERATION

The **Surefire® Incinerator** range by ECT offers reliable and efficient waste management solutions for small to medium-sized applications. Manufactured to handle waste capacities ranging from 25 kg/hr to 200 kg/hr, these fixed hearth incinerators offer a flexible and scalable solution for various industries, including healthcare, agriculture, and remote communities.

Each model in the range has been engineered for high-efficiency combustion and clean emissions, offering capacities suitable for small-scale operations through to regional disposal facilities. Designed for safety and sustainability, these incinerators help organisations dispose of waste effectively while minimising their overall carbon footprint.

KEY FEATURES

- Robust steel construction with 1600°C high alumina refractory layers
- Secondary afterburner chamber with a minimum 2-second retention time
- Fully automatic PLC-based control systems
- Fast warm-up and cycle times for efficient operation
- Wide loading aperture to accommodate bulky waste
- Fuel-efficient burners and thermal insulation to reduce operating costs
- Optional waste loading and ash removal systems
- Optional abatement system engineering and fitting
  - fully designed to meet a given emission standard

Fabrication of SF200 Medical Waste Incinerator for the Ministry of Health Turks & Caicos Island Government.

sales@ectechltd.com | www.ectechltd.com

INTRODUCTION

SUREFIRE
INCINERATORS

WASTE INCINERATION

TYPICAL APPLICATIONS

- **Healthcare:** Safe disposal of clinical and pathological waste in hospitals
- **Industrial:** Treatment of general and hazardous waste at source
- **Agricultural:** Incineration of animal carcasses and by-products
- **Municipal:** Waste reduction for small to medium-sized towns and facilities
- **Military:** Ideal for field hospitals and within temporary/remote deployments
- **Port Authorities:** Safe and efficient disposal of international ship-generated waste
- **Remote Communities:** Reliable on-site waste management where infrastructure is limited
- **Man Camps:** Efficient disposal of domestic and operational waste in mobile workforce settings

AVAILABLE OPTIONS

- Automatic Loading
- Mobile – Trailer or Skid Mounted
- Containerised Solutions
- Fuel Storage and Delivery
- Secondary Combustion Zone
- Energy Recovery
- Electrical Generator
- Wet Scrubber
- Waste Liquid Injection e.g. Oil

COMPLIANCE

Surefire® Incinerators can be designed and manufactured to meet or exceed recognised global emissions standards, including:

- EU Animal By-Products Regulation (EC) No. 1069/2009
- UK DEFRA guidelines
- WHO and UN recommendations for medical waste

SF150 Medical Waste Incinerator at Antigua & Barbuda Hospital.

sales@ectechltd.com | www.ectechltd.com

KEY INFORMATION

SUREFIRE
INCINERATORS

EFFICIENT. PORTABLE. READY.

CONTAINERISED INCINERATOR SOLUTIONS

ECT's ISO Containerised Incinerator systems provide a powerful, ready-to-use solution for on-site waste management, designed for performance in even the most challenging environments. Housed within standard ISO shipping containers, each unit is fully pre-installed and tested before delivery, allowing for rapid deployment and minimal setup. Once on-site, only the chimney needs to be connected, and the system can be operational within hours.

Ideal for remote, temporary, or emergency settings such as disaster zones, field hospitals, mining sites, and military operations, these systems deliver a reliable, compliant, and cost-effective method of managing waste safely and sustainably.

To learn more about our ISO Containerised Incinerator solutions, please contact a member of the ECT Sales Team today.

+44 (0) 161 337 4488

KEY FEATURES & BENEFITS

- **Rapid Deployment:** Pre-installed in ISO containers for quick setup and minimal site prep; operational within hours.
- **Portable & Redeployable:** Easily transported by truck or ship and relocated as needs change.
- **Cost-effective:** Minimal civil works or infrastructure required, keeping project costs low.
- **Environmentally Compliant:** Optional wet or dry scrubbers ensure emissions can be configured to meet global standards.
- **Versatile Performance:** Processes medical, industrial, dairy, and hazardous waste; trusted by military, humanitarian, and public health sectors.
- **Compact Design:** Small footprint ideal for confined or remote sites.
- **All-weather Durability:** Rugged, weatherproof containers perform reliably even in Arctic conditions.
- **Plug-and-play Simplicity:** Pre-assembled with burners, tanks, and controls; easy to operate with minimal training.

ECT's containerised incinerators deliver immediate, efficient, and sustainable waste management, anywhere, anytime.

sales@ectechltd.com | www.ectechltd.com

KEY INFORMATION | RANGE SPECIFICATIONS

SUREFIRE
INCINERATORS

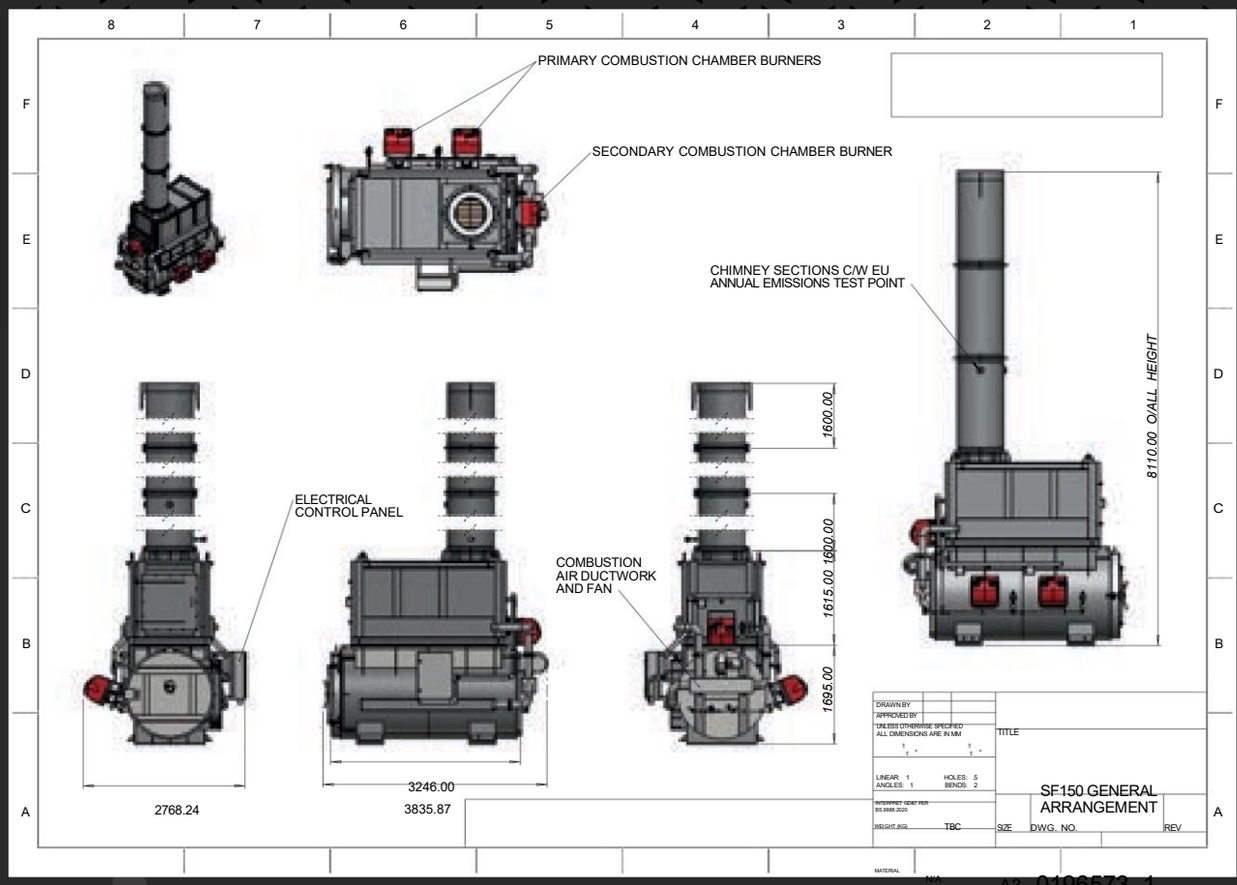


Image is for illustration purposes only. Dimensions and performance is subject to final unit specification.

Scan for more information about the Surefire® Incinerator range and access to the full specification data.

CASE STUDY

SUREFIRE 150
ROYAL DUTCH ARMY

PROJECT OVERVIEW

3 SF150 Surefire® Incinerators, designed for the Royal Dutch Army, were pre-installed in ISO shipping containers for easy transport and setup in Afghanistan, enabling efficient waste disposal while ensuring regulatory compliance.

AREA OF RESPONSIBILITY

ECT was responsible for the design, construction, management, installation, and commissioning.

EQUIPMENT (SELECTED)

- Container Housing
- Primary/Secondary Chamber
- Diesel-Fired Primary/Secondary Burner
- Combustion Air System
- Electric Generators
- User Friendly Control System
- Exhaust Chimney
- All Internal Hot Face Refractory Lining and Insulation

sales@ectechltd.com | www.ectechltd.com

CASE STUDY

SUREFIRE 150
US ARMY – AFGHANISTAN

PROJECT OVERVIEW

Supplied 11 Surefire® SF150 containerised general waste incinerators, specifically manufactured for the US Army to manage waste produced in man camps. Each unit is housed within a portable container, allowing for easy transport and setup across different locations.

Designed to incinerate various types of general waste, these incinerators enable the US Army to effectively manage and dispose of waste in a safe and efficient manner.

AREA OF RESPONSIBILITY

Entrusted with a range of specialist tasks encompassing design, construction, installation, and commissioning.

EQUIPMENT (SELECTED)

- Container Housing
- Primary Chamber
- Diesel-fired Primary Burner
- Combustion Air System
- Secondary Chamber
- Diesel-fired Secondary Burner
- Diesel Tank
- Control System
- Exhaust Chimney
- Operating Tools

sales@ectechltd.com | www.ectechltd.com

CASE STUDY

SUREFIRE 200
ENTREPOSE, ALBANIA

PROJECT OVERVIEW

Surefire® Incinerators offer the ultimate solution for efficient waste disposal with our skid-mounted, auto-load SF200 Incinerator. Designed for a world-leading contractor in Albania, that specialises in construction and operating infrastructure for the gas and oil industry.

With a user-friendly interface and automated loading system, the client can trust Surefire® Incinerators to handle their waste disposal needs efficiently and safely. The specific design met the needs of a busy work camp, which required minimal supervision.

AREA OF RESPONSIBILITY

ECT was responsible for delivering and overseeing specialist tasks, including design, construction, management, installation, and commissioning.

EQUIPMENT (SELECTED)

- Fixed Hearth With An Inner Lining Made Of Refractory Material
- Primary Combustion Chamber That Utilises Diesel Fuel
- Carbon Steel Refractory Lined Chimney
- Comprehensive Control Panel And Electrical Wiring System
- Combustion Air Supply Fan
- Hydraulically Actuated Ram Loading Box
- Manually Operated Raking Door w/ Integrated Batch Load Door

sales@ectechltd.com | www.ectechltd.com

INTRODUCTION

SUREFIRE
ENERGY FROM WASTE

ENERGY FROM WASTE

ECT's cutting-edge **Energy from Waste (EfW)** solutions convert various waste streams into a valuable, clean, and renewable energy resource, offering an environmentally responsible alternative to traditional waste disposal methods. At ECT, we understand that each waste stream is unique, requiring a tailored approach for combustion and optimal energy recovery.

To ensure that our solutions are perfectly aligned with your needs, we begin each project with a comprehensive Front-End Engineering Design (FEED) study. This detailed analysis examines the composition, volume, and characteristics of your waste, providing critical insights that guide the design of a custom EfW plant.

It further allows us to engineer a solution that maximises efficiency, meets regulatory standards, and aligns with your sustainability goals. From initial analysis to final implementation, our expert team works closely with you to develop a plant that not only handles your waste effectively but also contributes to a greener, more sustainable future. Each study can be tailored to individual customer needs and used to assess whether a project is viable.

They allow you to understand:

- **SITE REQUIREMENTS**
- **CAPEX**
- **OPEX**
- **ENVIRONMENTAL REQUIREMENTS**
- **PLANT LAYOUT**

WHY CHOOSE EFW?

EfW incineration plants provide a cleaner, more sustainable alternative to traditional waste disposal methods like landfilling, which contribute to greenhouse gas emissions and environmental pollution. By converting waste into energy, these facilities not only reduce waste volume but also generate usable power from materials that would otherwise be discarded.

Using advanced combustion technology, waste such as municipal solid, industrial, and agricultural waste is processed in specially designed chambers under strict environmental regulations. Sophisticated air pollution control systems capture and treat harmful emissions, ensuring a safe and environmentally responsible energy solution that minimises pollutants while maximising efficiency.

sales@ectechltd.com | www.ectechltd.com

KEY INFORMATION

SUREFIRE
ENERGY FROM WASTE

THE POWER OF PRECISE DESIGN

At ECT, our **Front-End Engineering Design (FEED)** study is the cornerstone of designing effective and efficient energy-from-waste solutions. Conducted by our team of experienced professionals, this in-depth analysis evaluates the composition, volume, and calorific value of your waste stream, providing the critical data needed to tailor a system to your needs.

Our experts bring years of industry knowledge to the table, ensuring that every aspect of the waste feed is thoroughly understood. This comprehensive study not only helps in optimising the design of your energy-from-waste plant but also ensures compliance with environmental regulations and maximises energy recovery.

By partnering with ECT, you benefit from a FEED study that lays the groundwork for a custom-engineered solution, one that turns your waste into a valuable resource while supporting your sustainability goals.

KEY THINGS TO CONSIDER

- **Waste Stream:** Defining the waste stream or other feedstock(s) using preliminary data about sources, content, composition, packaging, etc.
- **Environmental & Regulatory Requirements:** Identifying all of the applicable requirements for the jurisdiction in which the project operates. Our engineers will define solutions that meet all applicable requirements and position the project for operational and commercial success.
- **Preliminary Process Design:** Defining the thermal and energy recovery processes that will be central to the overall project.
- **Initial Facility Design:** In addition to the waste-to-energy and emission abatement plant, this should include arrival and staging of the waste, transport to and from the site.
- **Commercial Analysis:** Economic viability of the proposed solution compared with conditions today. This should consider capital acquisition costs along with operating costs such as fuel, maintenance and labor, in comparison.

To discuss setting up a FEED study, please contact a member of the ECT Sales Team today.

+44 (0) 161 337 4488

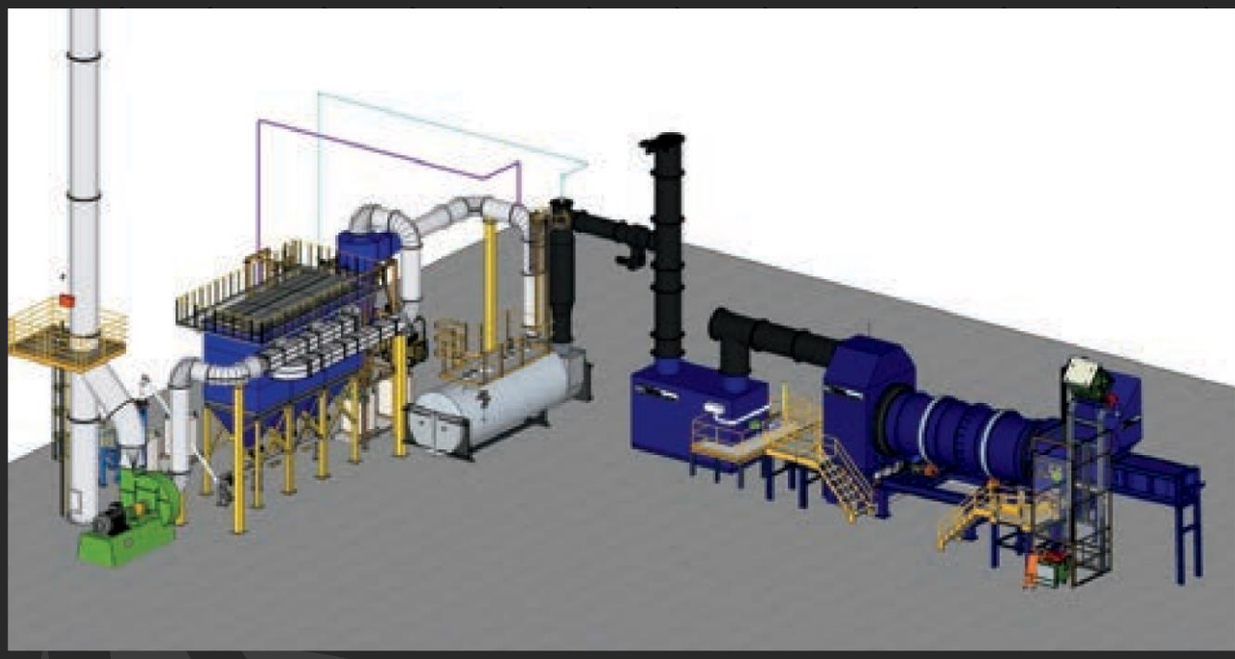
sales@ectechltd.com

SUREFIRE
ENERGY FROM WASTE

PLANT OPTIONS

1. ROTARY INCINERATION PLANT

Rotary Incineration plants promote the mixing of waste with the optimal combustion conditions, extending waste storage within the drum and producing high-quality ash.



The rotary combustion chamber is constructed as a cylindrical refractory-lined drum, inclined towards the de-ashing end.

Externally attached to the drum is a heavy steel tyre equipped with a geared motor. To ensure an optimal speed of waste movement through the incinerator, the control system controls the drive to ensure a rotational speed of between 2 and 10 revolutions per hour. This tumbling action is the technique that promotes the intimate mixing of waste with the combustion conditions, extending waste storage within the drum, optimal combustion, and high-quality ash.

Rotaries are typically selected because of their high agitation rate for less combustible waste, such as high moisture, sludges, and pastes. They are also selected when efficient burnout is required. Munitions could be an example of this.

KEY INFORMATION

SUREFIRE
ENERGY FROM WASTE

PLANT OPTIONS

2. STEPPED HEARTH INCINERATION PLANT

Stepped hearth incineration offers a robust, energy-efficient, and compliant solution for waste destruction. It delivers complete combustion, stable operation, and lower emissions, making it suitable for modern WIPD/IED-compliant waste-to-energy facilities, especially where waste composition varies.

Ideal for 24/7 processing of easily combustible waste, such as high-plastic medical waste, a stepped hearth plant provides a controlled and effective incineration solution.

A stepped hearth incinerator burns waste efficiently through a series of tiered hearths, with material moving downward by gravity or mechanical rams. Each hearth provides a distinct stage of combustion, drying, volatile release, burning, and ash burnout, supported by carefully controlled airflow and temperature.

This staged process ensures complete oxidation, producing stable, inert ash while minimising emissions and the formation of pollutants like dioxins and furans. The design is particularly effective for mixed or variable waste streams, offering reliable, high-efficiency performance for municipal, industrial, and clinical waste applications.

sales@ectechltd.com | www.ectechltd.com

KEY INFORMATION

SUREFIRE
ENERGY FROM WASTE

ENERGY RECOVERY

HOT WATER

Hot water is a key requirement in many industrial processes, or it can be used as a method of generating the heating requirements of administrative and industrial buildings.

Heat is indirectly recovered from the exhaust gases of the incinerators by passing them through a gas tube heat exchanger.

The heat is then exchanged with the external water jacket to provide a cost-free supply of hot water.

STEAM

Steam plays a vital role in industrial processes and heating, and our waste incinerators can be designed to convert waste heat into this valuable resource.

Heat is recovered indirectly from the incinerator's exhaust gases using a gas tube heat exchanger or radiant tube boiler, transferring energy to water to produce steam. For power generation, the steam is further heated in a superheater to create dry steam for turbines or generators, while economisers at the boiler outlet recover additional energy from the flue gas.

ELECTRICITY

Organic Rankine Cycle (ORC) systems are used when waste heat cannot be recovered as hot water energy.

Instead, they convert this heat into electricity by using hot water from the waste heat recovery boiler to heat a working fluid within the ORC.

The system operates on the same principle as a steam turbine, but its specialised working medium allows it to efficiently generate electricity from lower-temperature or smaller quantities of waste heat.

sales@ectechltd.com | www.ectechltd.com

CASE STUDY

5000 KG/HR EFW PLANT MAKKAH – SAUDI ARABIA

PROJECT OVERVIEW

ECT designed, built, and installed a 24-hour gas-fired rotary incineration plant with the capacity to process 5,000 kg of animal waste per hour. This advanced incineration system operates continuously and efficiently, effectively managing the waste generated during the pilgrimage. The integrated energy recovery system transfers 5.9 MW of waste heat to industrial boilers, maximising energy efficiency. The process reduces the mass of waste by 95–96%, producing a white, calcined ash containing less than 3% residual carbon.

The plant's flue gas abatement filtration and continuous emission monitoring systems ensure full compliance with all relevant environmental exhaust standards, including the stringent European Waste Incineration Directive. This safeguards both the environment and the well-being of local communities and pilgrims.

CHALLENGE

The purpose of the plant was to dispose of the animal waste associated with the Hajj religious festival in Makkah, Saudi Arabia. During the festival, approximately 10,000 tonnes of waste are produced in 4-5 days. Historically, this was landfilled.

However, to eliminate landfill and transport movement, the Ministry of Municipality and Rural Affairs (MOMRA) commissioned at £30M project including waste transfer systems, waste reception bunkers, transfer cranes, crushers, delivery conveyors and the disposal incinerators.

sales@ectechltd.com | www.ectechltd.com

CASE STUDY

5000 KG/HR EFW PLANT MAKKAH – SAUDI ARABIA

AREA OF RESPONSIBILITY

ECT was responsible for the design, construction, management, installation, and commissioning.

SCOPE OF SUPPLY

- 2 Off Rotary Primary Combustion
- Diesel Fired Ignition Burner
- Automated Combustion Air System
- Secondary Chamber
- Diesel Fired Secondary Burner
- Automated Ash Transfer Conveyors
- Emergency Bypass Systems
- Hot Gas Transfer Ducts
- 5.9 mw Waste Heat to Hot Water Boilers
- 1 Off Set of Hot Water Pipes
- Array Of Fan Cooled Heat Pumps
- Cool Gas Transfer Ducts
- Sodium Bicarbonate Storage and Delivery Systems
- Flue Gas Abatement Filtration Plants
- Compressed Air System
- Remotely Monitored Control System
- Exhaust Chimneys

sales@ectechltd.com | www.ectechltd.com

CASE STUDY

2000 KG/HR EFW PLANT LA COLLETTE - JERSEY

PROJECT OVERVIEW

The facility is a specialised waste incineration plant, equipped to handle 200 kilograms of waste per hour. This contemporary structure has been meticulously designed and constructed in full compliance with the EU Waste Incineration Directive (WID) 2000/76/EU.

Located at La Collette Jersey, it has been purposefully crafted to suit the unique requirements of the Department of Infrastructure, encapsulating an innovative approach towards efficient waste management within the premises.

The facility is of recent construction, ensuring full compliance with the most current environmental legislation. Built with innovative design principles, it accepts and stores wheeled bins in a preliminary phase before these are subjected to an automatic weighing process and subsequently loaded into the designated container.

AREA OF RESPONSIBILITY

ECT was entrusted with tasks encompassing design, construction, installation, and commissioning.

sales@ectechltd.com | www.ectechltd.com

CASE STUDY

2000 KG/HR EFW PLANT LA COLLETTE - JERSEY

OPERATIONAL DESIGN

In operation continuously for 24 hours each day, available throughout the week, spanning 7 days and accommodating an annual time frame of 312 days. Notably, providing a yearly service duration of 7,500 hours which accounts for an impressive availability rate of approximately 85.6%.

SCOPE OF SUPPLY

- Refined Waste Bin Processing Systems
- Advanced Elevator and Bin Control Mechanisms
- Automated Ram Loading Apparatus
- Enhanced Stepped Hearth Primary Combustion Zone
- Key Feature: Secondary Chamber With a 2-Second Residence Time At 1100°c
- Optimised Diesel Storage and Dissemination Apparatus
- Efficient Wet Ash Conveyor System
- Robust Hot Gas Redistribution Ducts
- Urea-Based NOx Reduction Injection Technology
- Customised Emergency Override Facilities
- Waste Heat to Hot Water Conversion Exchanger
- Engineered Cool Gas Transition Infrastructure
- Activated Carbon Dosage System for Improved Air Quality
- Sodium Bicarbonate Deployment Structure for Adequate Flue Neutralisation
- Holistic Flue-Gas Decontamination Arrangement
- Compressed Air Resource Augmentation Module
- Integrated Continuous Emission Surveillance Systems
- Remote Supervisory Control Mechanism Framework
- Induced Draught Fan Coupled with an Acoustic Shield Encasing
- Tailor-Made Industrial Exhaust Chimney
- Hot Water Recycling Network
- Functional Hot Water Cooling Configuration
- Highly Effective Bin Cleaning Application
- End-To-End Installation Services
- Streamlined Commissioning Processes
- Emissions Verification Methodology

sales@ectechltd.com | www.ectechltd.com

ABOUT US

ENVIRONMENTAL
COMBUSTION TECHNOLOGIES

Environmental Combustion Technologies (ECT) is a leader in the design, manufacture, and supply of advanced combustion systems, a total solutions provider specialising in waste incinerators, and waste-to-energy applications.

ECT draws together a combination of seasoned industry experts possessing decades of collective experience with dynamic new talent drawn from diverse engineering disciplines. This powerful blend of deep-rooted knowledge and fresh, innovative perspectives creates a truly progressive and collaborative team.

With backgrounds spanning combustion, process, and environmental engineering, our team thrives on cross-disciplinary thinking. Our experienced professionals provide strategic insight and proven methodologies, while our emerging engineers challenge conventions and drive creative problem-solving.

What unites us is a shared vision: to pioneer the most sustainable engineering solutions for a rapidly evolving world. Together, we're committed to delivering cutting-edge yet practical innovations that meet today's challenges while safeguarding tomorrow's resources.

OUR VISION

To lead the transformation of the waste incineration and waste-to-energy sectors through cutting-edge, sustainable engineering solutions that set new industry benchmarks for environmental performance and operational efficiency.

OUR APPROACH

We offer an integrated portfolio of high-performance systems and modular technologies engineered for real-world applications. Our solutions are designed to optimise environmental outcomes without compromising on reliability, cost-efficiency, or compliance.

By aligning technical innovation with the realities of operational requirements with consideration for infrastructure and resource constraints, we deliver tailored, future-ready systems that support long-term sustainability goals, without sacrificing practicality or performance.

At our core we are:

sales@ectechltd.com | www.ectechltd.com

IMPORTANT NOTES

OUR ACCREDITATIONS

To learn more about our Surefire® waste incineration units or our energy from waste solutions, please contact a member of the ECT Sales Team today.

+44 (0) 161 337 4488

sales@ectechltd.com