

Managing Risk

■ waste disposal: a complex problem



Waste Oil & Hazardous Liquids



Medical Waste



Sewage Sludge/Latrine Waste



Non-hazardous Solid Waste

■ addressing waste disposal requirements

EWS has made significant investments in Research & Development to innovate our technology. However, our products have been **fully commercialized and successfully operated since 1994**.

EWS offers a range of customized packages to meet specific waste management needs. The product line includes: small two-stage controlled air batch incinerators in capacities from 100 – 10,000 kg of solid waste per cycle, containerized mobile incinerators, liquid waste processors and continuous operation systems in modules of up to 100 tonnes per day.

Waste heat recovery is available with any of the packages. Systems can produce a range of valuable by-products including **hot water, steam and power**. Our engineering team will design, integrate and develop a total package including maximum achievable control technology air pollution control equipment, continuous emissions monitoring and our industry-leading controls package with the best in data monitoring and recording. This equipment is proven to meet the strictest air emission requirements in the world today.

The Eco Waste Oxidizer system can process a range of waste materials generated on-site. Waste materials do not require special treatment before processing. The following is a list of some of the potential waste streams that can be effectively processed in our system.

Waste Materials Suitable for Processing in Eco Waste Solutions Technology

■ Solid Waste	Description	Origin
Food Waste	Food, food packaging and containers, plastic and paper waste from food preparation	Kitchen and dining areas
Domestic Waste	General refuse such as paper, plastics, cans, bottles, cardboard, newsprint	Dormitory areas or households, recreation facilities, office areas, warehouse, plant and production facilities
Packaging	Cardboard boxes, paper, plastic containers, plastic film, styrofoam, poly-weave bags	Consumer goods and industrial and/or commercial supplies
Wood Waste	Skids, pallets, crates, including wood materials contaminated with chemical residues	Industrial and Commercial: Construction activity, inbound supplies, reagent and chemical packaging.
Absorbents	Rags, wipes, spill cleanup materials	Industrial
Filters – Air and Fluid	Filters coated with fine particles and trapped solids, saturated with water or fluids (glycol, lube oils, fuel)	From water treatment facility, or generated at industrial sites from maintenance of vehicles, machinery and equipment
Medical Waste	Bandages, dressings, gloves, swabs, syringes, sharps	Medical clinic or first aid centre
Tires & Rubbers	Tires, belts, hoses	From vehicles and equipment maintenance shops
■ Liquid Waste	Description	Origin
Glycol	Used antifreeze	From vehicles and equipment maintenance shops
Used Oils	Used lubricating and hydraulic oils, including synthetics	From vehicles and equipment maintenance shops
■ Semi-Solid Waste	Description	Origin
Sewage Sludge	Dry filter cakes	From sewage treatment plant dewatering equipment
Kitchen grease, oils	Solid kitchen fats, grease, used cooking oil	Kitchen grease traps, fryers

Eliminating Waste

our technology

EWS has field-proven advanced waste management solutions, in mobile and fixed packages, and innovative waste-to-energy applications. We address the needs of large and small populations, and have provided solutions for global armed forces, communities and resource industry operations.



■ Cleaner Burning:

- **Best Available Technology:** utilizes 2-second retention at 1832°F (1000°C) for maximum pollution control
- **Tested, Proven and Verified:** Air emissions tested by accredited independent laboratories including Environment Canada, with verification under the ETV (Environmental Technology Verification) program
- **Air emissions meet US EPA Standards** with lowest levels of Dioxins & Furans
- Ash residual meets US EPA TCLP standards: non-toxic, non-hazardous, non-leaching
- Waste input is reduced by over 90% to safe, inert residual

■ Better Built:

- **Simple to use:** 1 button operation, automated operation does not require oversight
- No special handling/pre-processing of waste
- Robust, heavier grade materials, and few moving parts for long equipment life
- Easy in-field maintenance
- **Proven in-the-field, reliable with maximum uptime**
- Strict quality control standards
- ISO 9001:2008 certified manufacturer

■ More Advanced:

- **Patented in the US, Canada and EU:** process designed to achieve the cleanest possible emissions commercially available today
- **Award-winning** company recognized for world-leading clean technology
- Modular design is **scaleable** to meet a range of capacities, without the need for lengthy on-site construction projects
- Innovation: **4th Generation Control Technology** (PLC based, real-time remote monitoring, graphic interface with touch-screen)
- Innovation: **Mobile/Containerized system:** Modular Concept evolved to meet NATO standards including EU-compliant air pollution control package, continuous emission monitors all in a rugged, "plug & play" containerized design with special base-frame to minimize infrastructure (eliminates need for a concrete pad)

batch process overview

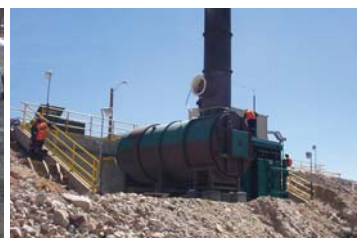
Batch processing involves the conversion of waste materials as a single batch load without disturbance to the waste bed and without adding more waste until the completion of the cycle. This design produces a much cleaner emission and removes the need for constant attendance to the process which is fully automated after loading and starting the machine.

The EWS batch feed system technology utilizes a starved-air (pyrolysis) combustion process to burn the waste. In the first stage a burner is used to elevate the temperature of the Primary Chamber, to the point of sustained combustion at 600°C-850°C (1200°F -1560°F). In this stage, which is designed to utilize minimal oxygen levels, the process becomes self-fueling and continues until the original waste volume and weight is reduced by over 90%. The original solid waste is gasified (converted to gas) while the non-combustible portion remains as residual ash which is non-hazardous, non-leaching and essentially inert.

As waste burns in the Primary Chamber, the gases generated, enter the high temperature, richly oxygenated and turbulent conditions of the Secondary Chamber for cleansing. This stage of the process is complete after the gases are retained for two seconds at an internal temperature of 1000°C (1832°F). EWS' proprietary control system ensures a consistent, thorough processing and the cleanest possible thermal treatment. The process is fully automated and does not require an operator in attendance to oversee the complete cycle once in progress.

After the completion of the burn and cooling cycles, residual materials are removed by manual or automated means and the complete process is repeated.

These packages may require an Air Pollution Control (APC) system, or Scrubber, to meet local environmental regulations. All EWS systems can be outfitted with an APC to further cleanse and neutralize exhaust gases to ensure compliance with local air emission standards.

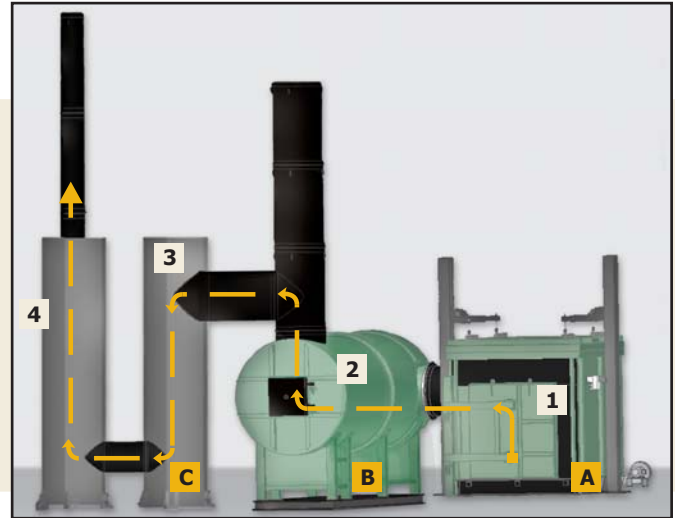


Eliminating Waste

ECO Model Process Overview

- A. Primary Chamber**
solid waste combustion
- B. Secondary Chamber**
combustion of gases from Primary Chamber
- C. Optional Air Pollution Control**
(Wet Scrubber Shown)
additional cleansing of gases if required

1. movement of gases to secondary chamber
2. high temperature and turbulent environment
3. rapid quench cooling gases
4. scrubbing of gases



batch models

ECO Model

The ECO Model is a custom-sized waste disposal system processing **from 1 to 10 tonnes per day**. The ECO Model features one or two large Primary Chambers that can accommodate unsorted waste including large bulky items.

The ECO Model operates in a **one-batch-per-day fashion**. The burn cycle is generally 8 to 12 hours followed by a 6 to 10 hour cool down. The complete process, including time for loading and ash removal, takes place over 24 hours. This model can be outfitted with various options to automate waste loading.

This model has an **extremely low labour requirement** as the Operator only interfaces with the equipment once a day. Once the ash residual from the previous day's waste is removed, the operator loads the entire batch to the system (the chamber is cold and not active). This process of ash removal and loading of waste takes less than 1 hour for most configurations.



ECO Mobile

The ECO Mobile combines the EWS patented process with the **transportability** of a skid-mounted incinerator package.

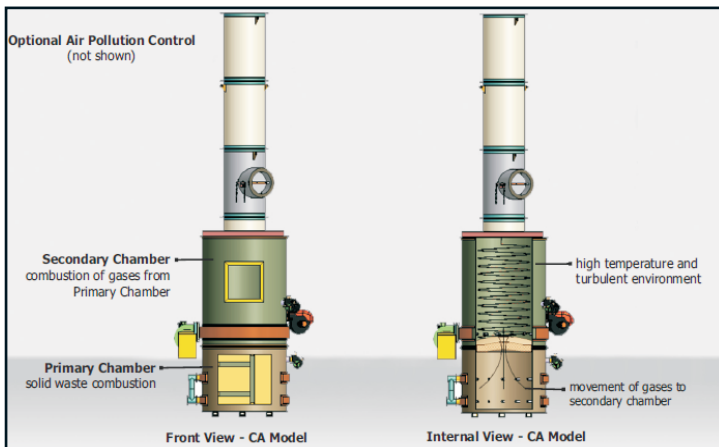
This pre-configured and pre-tested Eco Waste Oxidizer is permanently housed in a 20' or 40' ISO shipping container. The **"plug-and-play"** design allows the unit to be setup and operational with minimal assembly, within hours. After the utility hook-ups and stack assembly are complete, the unit is ready for operation. Similarly, this **self-contained** unit allows for easy disassembly and transportation to another location.

The ECO Mobile integrates all of the Eco Waste system components including the Primary Chamber, Secondary Chamber, Stacks and Main Control Panel. The ECO Mobile can include a fully containerized Scrubber or Air Pollution Control (APC) module to **meet any global air emission standard**. Other optional features such as batch or continuous waste loading devices, continuous emission monitoring systems (CEMS) and waste storage are also available as fully mobile containerized modules.



Batch Feed Systems

CA Model Process Overview



CA Model

The CA Model is similar to the ECO Model in function; however, it has a **smaller footprint**. The Secondary Chamber is stacked on top of the Primary Chamber to save space. This unit has the **same rugged construction** and all of the **advanced features** of the ECO Model. The CA Model is suited for smaller volumes of waste generated at a remote site such as an exploration camp or a seasonal project site. This model is available in three standard sizes.

This unit is manually loaded and has short batch times of 2 to 6 hours (depending on waste type). It is capable of processing multiple batches in a 24 hour period.

