



## MacroBurn Incinerators Without Filtration Brochure

Macrotec's Incinerators with no filtration offer an efficient way to dispose of a wide range of wastes while reducing the environmental impact.

Our incinerators have been designed to reduce every possible threat to the environment, while providing a reliable and cost effective solution. We make use of advanced designs in our combustion plant, which regulates the combustion rate, temperature in the different chambers, turbulence, gas velocities and supply of oxygen.



## Lowest Emissions

All our incinerators are optimized to minimise emissions, with large combustion and settling chambers, high velocity combustion air, and high output burners. See our Incinerators with Filtration for units that comply to EU emission regulations.

## Quality

Our objective is to design and manufacture Quality Incinerators, that are robust, easy to operate, and with low maintenance requirements.

## Certification

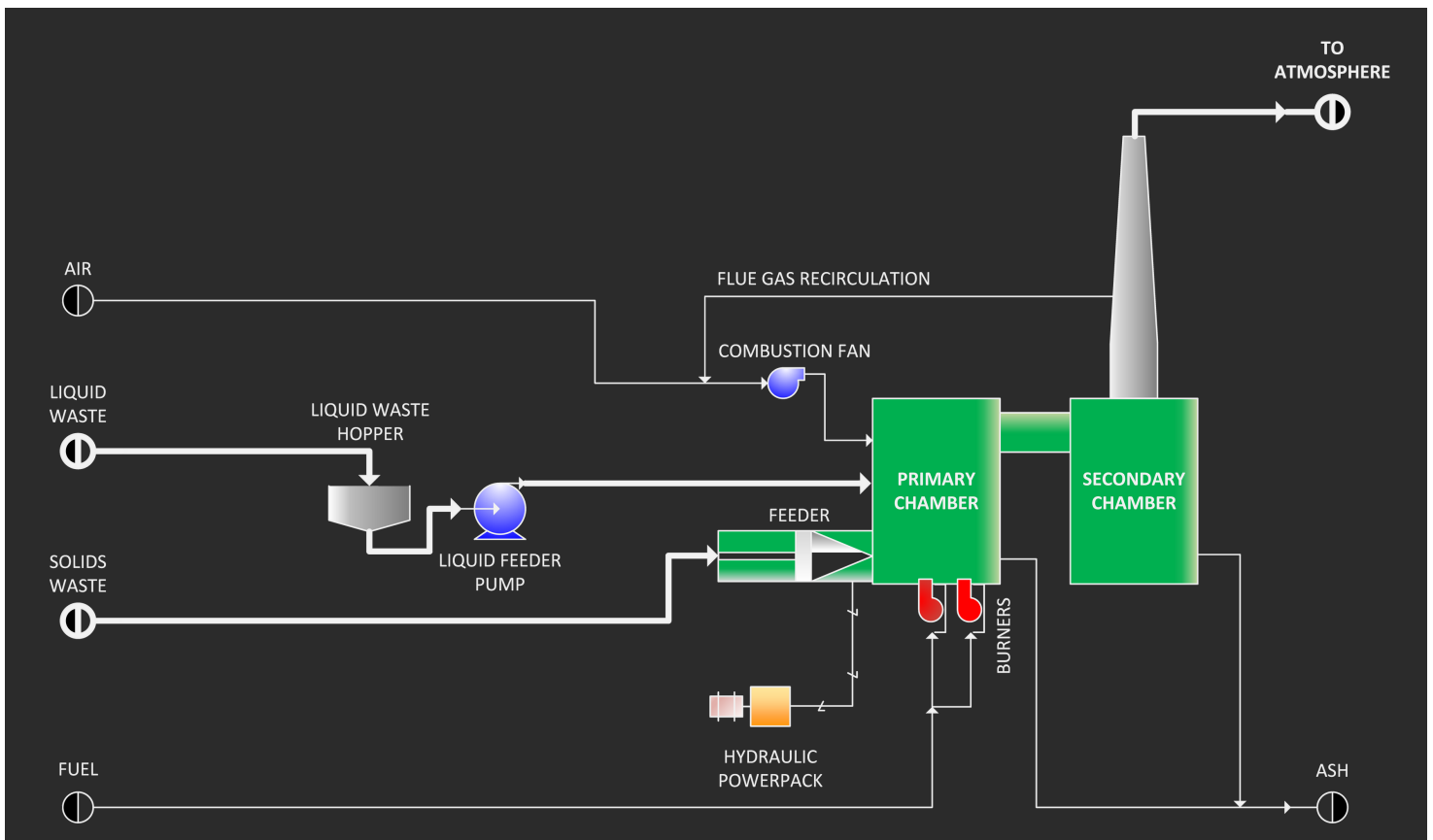
Macrotec is certified to the following standards:

- ISO 9001:2015 | Quality Management Systems
- ISO 14001:2015 | Environmental Management Systems
- ISO 45001:2018 | Occupational Health & Safety Management



## Design

Our Incinerators are two chamber units, with auxiliary burners, combustion air fans, manual or auto feeder, and a stack.



## Incinerator

All our incinerator models have two chambers, with a large hearth to help distribute the waste, and a large secondary chamber to promote settling of particulate matter (dust). The chambers are also sized for a two second reaction (retention) time.

We use a high temperature alumina-silicate refractory, with a cold crushing strength of 80Mpa and service temperature of 1,500°C to cast our incinerators. The refractory is acid resistant with very high abrasion resistance. We also insert 100mm of low-density insulation, giving an incubator a typical R-value of 1.54m<sup>2</sup>K/W, minimising heat loss for lower fuel consumption and a safer working environment.

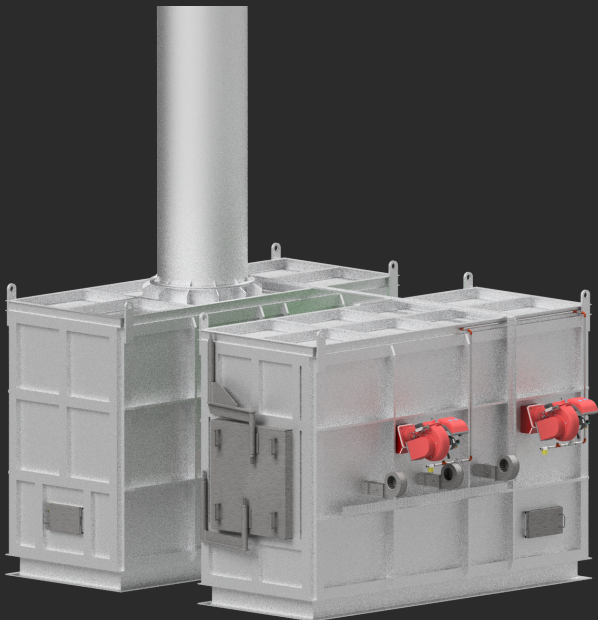
All our incinerators operate on a continuous feed basis. This entails waste being loaded on fixed intervals with ash being removed from the rear without the need to stop. Due to not stop and starting as you would with a batch incinerator, fuel consumption is improved (no preheat required), and emissions are also improved due to a more controlled combustion process.

### **Auto Feeder (Optional)**

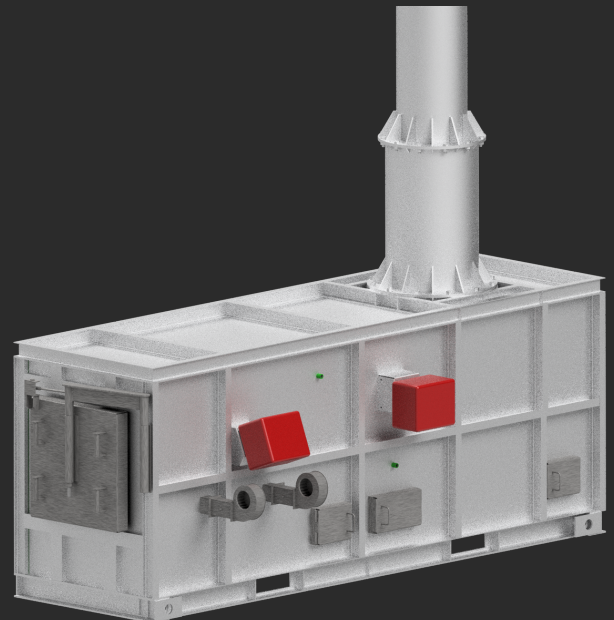
Our incinerators also have the option for a fully automated feeder. The auto feeder is as the name suggests completely automated, with the operator only being required to load waste into the feeder. Once the feeder is loaded, and safety button engaged, the system will determine when to feed. This prevents over feeding by operators and increases safety around the incinerator feeder.

### **Manual Feeder (Optional)**

Our incinerators come with the option of a manual feeder. The manual feeder provides a cost-effective solution for safer and more controlled feeding, with the operators pulling the feeder back, placing the waste into a hopper, and then pushing the waste into the incinerator. During this process the operator is not exposed to direct heat from the incinerator.



Isometric View: MacroBurn V330



Isometric View: MacroBurn V100



## Stack

The standard stack height on our incinerators ranges from 7m to 15m, depending on the model size, with taller stacks optional. Our stacks are taller than most of our competitors for good reason, the increased height increases the draft, increasing the velocity of the flue gas releasing it at greater height resulting in better dispersion.

According to EPA (Environmental Protection Agency – USA), Good Engineering Practice for stacks is calculated as  $H + 1.5L$ , where H is the height of the building itself or any significant nearby structure or structures and L is the lesser of the projected height or width of the building in question. If this is applied to the typical building in a remote setting, away from larger buildings, a minimum stack height of 7m would be recommended. This needs to be calculated on a site-by-site basis and might require a taller stack.

## Combustion Air

Our incinerator combustion air is designed to optimize turbulence and mixing in the primary chamber, by blowing in the combustion air at high velocity over the waste. This promotes combustion and also increases combustion efficiency by ensuring that combustion gasses are adequately mixed with oxygen for the oxidation of combustible gasses.

## Burners

Our incinerator combustion air is designed to optimize turbulence and mixing in the primary chamber, by blowing in the combustion air at high velocity over the waste. This promotes combustion and also increases combustion efficiency by ensuring that combustion gasses are adequately mixed with oxygen for the oxidation of combustible gasses.



# CFD Simulations

CFD (computational fluid dynamics) simulation is done on each incinerator we design to optimize the design and operation. We use CFD to optimise:

- Chamber sizes and dimensions to help reduce cold spots and shortcuts
- Burner placement to optimise the distribution of thermal energy
- Fan placement to optimise mixing of oxygen and flue gas and overall turbulence

