

## Optimising Settings for First Incineration

### THESE ARE GUIDELINES ONLY

**Although in principal, incineration is a simple process, you will need to perform test burns in the early stages of your learning curve to ascertain the most appropriate batch size and burn temperature so you optimise efficiency and have the cleanest emissions. Combustion is a process requiring heat, fuel and oxygen in the correct quantities, and waste streams can affect the combustion results.**

**Air** - Black Smoke is usually caused by a lack of oxygen during the combustion process. Increasing the air settings on the air regulator (located on the side of the burner) will provide better air to fuel ratio and will also increase the burn rate (This assumes you haven't overfilled the chamber with waste). Increase the air regulators slowly though so you don't have too much oxygen, and not enough fuel or heat.

**Fuel** - You are supplying fuel to the combustion process through the burners but also through the waste loaded into the chamber. You may find that the preheated refractory concrete will cause the waste to automatically ignite, but if not, have primary burner(s) on, only for a short time, to ignite waste. Once the waste starts to burn itself, you can turn primary burner(s) off. This will help you to obtain better combustion conditions, and also to save fuel.

**Temperature** - In the case of very flammable materials (which is very often the case with medical waste or waste containing plastics), try preheating to a lower temperature i.e. 500°C, as this will prevent all the waste material from flashing instantly, causing too much energy to be released in a very short time.

### Achieving optimal batch size

- 1 Preheat using both burners with low air settings during preheating (main burner air regulator on 3 – 3.5) to 500 – 550°C.
- 2 Turn off primary burner and load small quantity of waste initially.
- 3 If temperature starts to increase, this means the waste has ignited from the heat in the refractory achieved at pre-heat, so leave the primary burner off and increase the air settings on the primary burner air regulator to 7 – 8.
- 4 If you don't see a quick rise in temperature, re-start primary burner only for a short period of time (i.e. 1 minute), and increase air settings on the air regulator on the main burner to 7 - 8. When waste ignites, you can turn off the primary burner.
- 5 After a period of time (dependent upon waste type and amount), you will notice the temperature starting to drop. This indicates that the waste has been mostly burned, and you can load another batch.
- 6 If the first batch burned with clean emissions, for the second batch, increase the batch size and repeat as above. Continue in this manner, gradually increasing batch size whilst maintaining clean emissions. Black smoke will