

Process Description

Human remains will be cremated in one of two Facultatieve Technologies Ltd FTIII Series cremators. The support fuel is natural gas. The emissions to atmosphere shall be abated to below the limits specified in PG5/2 (12) by the installation of a flue gas treatment system. Each system is dedicated to a single cremator and is designed to treat the waste gases from one cremator only.

Flue gases from the cremator(s) are cooled, by waste heat recovery, and treated using powdered reagent and filtration to abate levels of Hydrogen Chloride, Particulate Matter, Mercury, and Dioxins & Furans to achieve emission levels lower than those prescribed by the "Secretary of States Guidance for Crematoria, Process Guidance Note 5/2(12)". Emissions to atmosphere are via the existing masonry chimney tower that shall effectively contain four independent steel liners. Two liners will be used by each cremators emergency bypass arrangement, and two the abated gases from each flue gas treatment system.

The existing chimney arrangement was originally designed to disperse the emissions from at least two unabated cremators. It follows that the existing chimney height is more than adequate to cater for two cremators served by independent flue gas treatment systems given that the future emissions to atmosphere will be decreased significantly from earlier design levels.

Following cremation, the calcined residues are raked into stainless steel pans, and are treated in a Facultatieve Technologies High Speed Cremulator with Ash Transfer Cabinet. Dust extraction for this process is provided by a vacuum extraction system with bag filter. The filtered air extracted is discharged back into the room thus there is no external exhaust vent to atmosphere.

Scope of the Activity

In this context the activity comprises:

The receipt of coffins containing human remains:

The cremation of human remains:

The grinding or size reduction of the calcined residues from the cremation:

The receipt, handling, storage of materials and wastes relating to the activity.

Cremator Operation

The Facultatieve Technologies FTIII cremator is designed to cremate human remains, up to substantially larger than average size, and operates to the requirements of PG5/2(12) regarding minimum operating temperature, oxygen concentration and secondary combustion zone residence time.

The cremator(s) comprise of a primary chamber of generous proportions into which the coffin is inserted and within which the primary combustion takes place. The hearth comprises flat refractory tiles. To keep the primary chamber entirely separate from the secondary chamber and avoid bypassing of the flue gases the hearth itself contains no openings, this ensures that all materials are retained for combustion in the primary chamber. The waste gas produced from this phase of the process exits the primary chamber via transfer ports in the chamber sidewall, descending below the solid hearth into the secondary combustion zone in which the gas phase combustion takes place. The gases enter this zone and are then heated if necessary, by the secondary zone burner and treated by the introduction of additional air. The flue gases make numerous passes within the secondary combustion zone, where the temperature is maintained

above the required minimum combustion temperature of 800°C when operating through the abatement system, such that the two requirements of temperature and oxygen are met to ensure compliance to the local environmental requirements. The minimum temperature is automatically increased to 850°C in the event of unabated cremator operation, using the bypass flues installed. Feedback to the control system from an oxygen monitor, at the secondary combustion chamber outlet ensures close control is always maintained. The secondary chamber is a single path flue system situated underneath and to one side of the Primary chamber. The secondary chamber is equipped with a secondary burner and secondary air jets to ensure the temperature throughout is maintained above 800°C and a minimum residence time of 2 seconds is achieved in the generous 3.2m³ chamber volume. The cremator(s) charge door is interlocked with the secondary combustion chamber temperature to prevent charging until the temperature is above the minimum required. The temperatures of the main chamber, secondary chamber inlet and secondary chamber outlet and the secondary chamber outlet oxygen concentration are continuously monitored and recorded.

The cremator(s) are computer controlled to ensure combustion related emissions (Carbon Monoxide and Volatile Organic Compounds) are maintained at levels considerably below those required by PG5/2 (12).