

Thesis Title	A Study Design of Fluidized-Bed Sludge Incinerator
Thesis Credits	12
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Degree of Study	Master of Engineering
Department	Environmental Technology
Academic Year	1997

Abstract

The objectives of this thesis are to design and study the functions of a pilot-scale incinerator. This incinerator is designed using the characteristics of sludge from the Huai Kwang wastewater treatment plant. In this study the combustion and destruction efficiencies were investigated. However, it still allows for improvement of this incinerator for further research proposes.

The cylindrical incinerator was built with refractor concrete(Cast-13), with dimensions of 0.6 m. OD., 0.2 m. ID. at combustion zone, and 0.4 m. OD. at freeboard. Other auxiliaries included induced draft fans, a screw sludge feeder, a temperature/pressure system, an electronical control system, a cyclone, a preheat burner as well as a perforated distributor windbox (1 mm. ϕ with 30 holes/sq.cm.).

From varying conditions of combustion, the suitable conditions for sludge decomposition of this incinerator were found to be 4.35 kg/hr LPG flowrate, 7.5 m³/hr. premix-air for LPG, and 32 m³/hr. fluidizing air. The sludge feeding were, then, varied at 10, 15, 20, 25, and 30 kg/hr. The maximum combustion efficiency was found to be 95.62 % at sludge feeding rate 15 kg/hr. In the same manner, the maximum destruction efficiency was found to be 96.67 % at sludge feeding rate 10 kg/hr

Keywords: Fluidized-bed / Sludge Incinerator / Sludge / Incinerator / Fluidized-bed
Sludge Incinerator