Hankin Fluid Bed Incineration System

Hankin Fluid Bed Furnace

Fluid bed combustion systems have been used successfully for more than 40 years to burn many different types of materials. The Hankin Fluid Bed Furnace is designed for efficient and complete combustion of sludges generated from both municipal and industrial wastewater treatment processes.

Efficient combustion requires a controlled residence time, high temperature, and turbulence. These "three T's" of combustion are all present in the Hankin Fluid Bed Furnace. Fluidizing air is introduced into the bottom of the bed, passes through the bed and freeboard. The products of combustion leave the furnace through an exhaust duct located at the top of the furnace. This provides uniform control of residence time. High temperatures are produced by the combustion of the waste material and maintained by the fluid bed itself, which acts as a heat sink. Turbulence is provided by the violent mixing of solids and gases in the fluidized bed, which also creates even bed temperatures with rapid and uniform combustion reactions.

A Hankin Fluid Bed Sludge Incineration System provides an environmentally sound and practical method of reducing wastewater sludges to a sterile, inert ash. A volume reduction of 95% from the incoming feed to the inert ash is typical.

Exhaust gases meet all local, state and federal air pollution control requirements.

Furnace Exhaust Duct and Heat Recovery Boiler, installed at Ocean County, Bayville, New Jersey.

Fluid Bed Operation

A fluid bed furnace is a refractory-lined, steel cylinder divided horizontally by an air distribution plate or hearth, which is located directly above the windbox. The air distribution method employs individual tuyeres that are mounted in a steel plate for a cold wind box or a refractory hearth for a hot windbox.

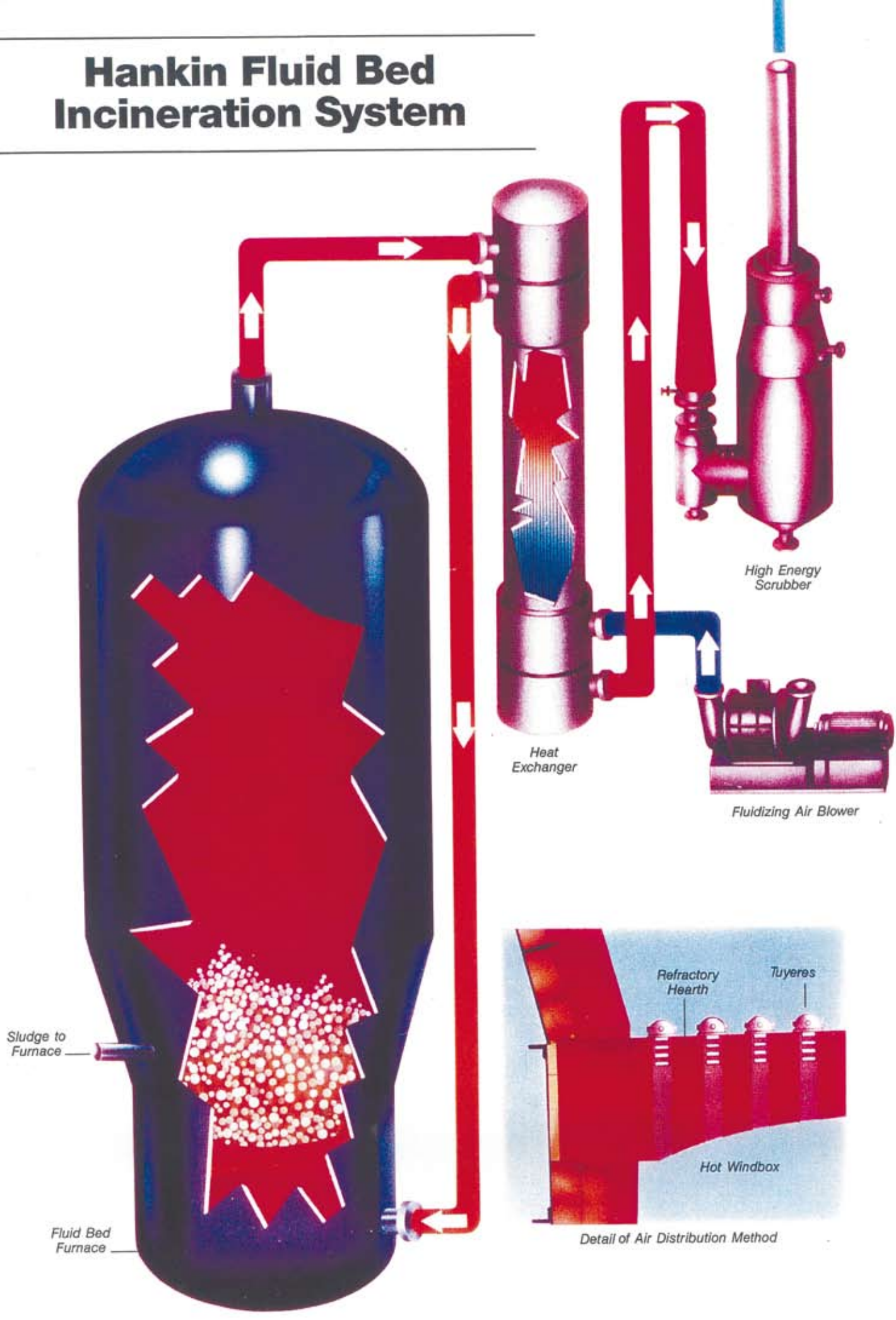
Operation begins when air is introduced into the windbox and passes through the tuyeres into the bed. This results in an increase in gas velocity causing the bed to be lifted, expanded, suspended, and finally fluidized by the gases. The fluid bed actually resembles the action of a boiling liquid in that it obeys most laws of fluid dynamics.

After this bed is fluidized and preheated to a selected temperature by an auxiliary fuel, such as oil or gas, the waste material is introduced into the furnace. The heat transfer rate and turbulence within the bed causes very uniform incineration of the waste. The gaseous products of combustion, along with ash, leave the bed and enter the gas-solids disengagement zone or freeboard. In the freeboard, the gas velocity decreases and additional time is provided for complete combustion.

The ash-containing exhaust gas stream leaves the furnace and passes through an air-to-gas heat exchanger, which preheats the fluidizing air. Following the heat exchanger, particulate matter is removed by a high energy wet scrubber to meet all applicable air pollution control standards prior to discharge into the atmosphere. All of the inert material or ash present in the feed is collected by the scrubber and discharged from the scrubber as a slurry. The slurry may be dewatered prior to disposal.

Hankin Fluid Bed Furnace prior to installation at the Utilities Authority in Ocean County, Bayville, New Jersey.

Hankin Fluid Bed Incineration System



Advantages of the Hankin Fluid Bed Furnace

Efficient Intermittent Operation

The bed of hot sand is a heat sink which maintains a high enough temperature to permit immediate start up after shut-downs for up to 16 hours or longer. Temperature losses during a shutdown are approximately 10°F per hour.

Accepts All Feed Materials

Any proportion of sludge, grease or scum can be fed into the furnace until the unit reaches its thermal capacity.

Accurate Temperature Control

Automatic control of temperature, within 10°F, is accomplished by injection of cooling water, if required, during autogeneous operation or by fuel injection for non-autogeneous combustion.

Low Maintenance

No moving parts results in reduced maintenance while the isothermal conditions, which are inherent in the reactor during operation, start-up, or shutdown, help to prolong refractory life.

Heat Recovery

Heat may be recovered by a gas to air heat exchanger, which preheats the incoming fluidizing air, or by a heat recovery boiler. With a typical sludge and a reactor outlet temperature of 1400°F, as much as 45% of the heat contained in the feed can be recovered in the form of steam.

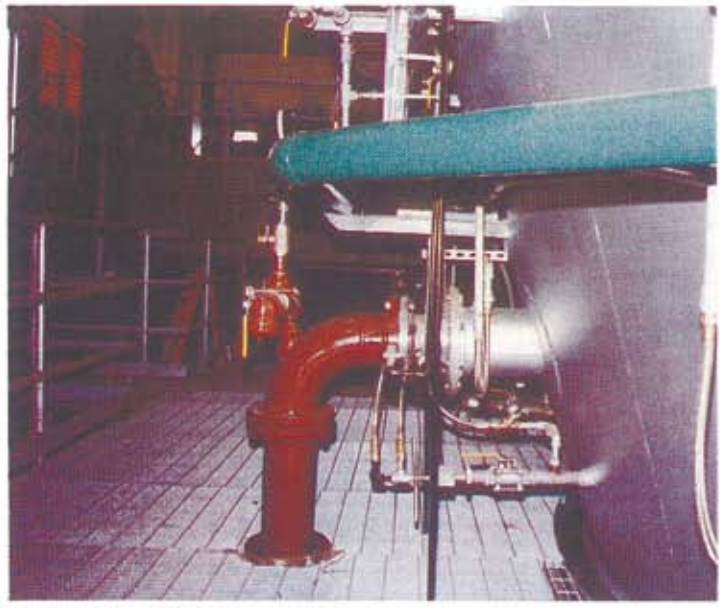
Hankin Fluid Bed technology is currently being used in William T. Field Memorial Pollution Control Plant, Watertown, New York • Ocean County Utilities Authority, Bayville, New Jersey • Somerset-Raritan Valley Sewerage Authority, Bridgewater, New Jersey and Two Bridges Sewerage Authority, Lincoln Park, New Jersey scheduled for operation in 1993.

Other Products & Services from Hankin

■ Multiple Hearth Furnaces
■ Shaft Kilns ■ Engineering Studies

Hankin is the exclusive licensee for the Nichols Technology

Local representative:



Sludge, fuel and air piping at SRVSA, Bridgewater, NJ.*

Wet Electrostatic Precipitator and Exhaust Gas Reheater at Somerset-Raritan Valley Sewerage Authority, Bridgewater, NJ.*

CSE global

Asia Office:
No. 2 Ubi View Singapore 408556
Tel: (65) 6512 0333 | Fax: (65) 6742 9179
Website: www.cse-global.com

Hankin Environmental Systems Inc.
One Harvard Way, Suite 6, PO Box 5759, Hillsborough, NJ 08844
Tel: 908-722-9595 Fax: 908-722-9514 E-mail: hankin@earthlink.net
Website: www.hankinenv.com