

Precious Metal Recovery

Technology
for a
Sustainable Future

Application

Asahi Holdings in Japan, formerly in partnership with a UK metal technology specialist, recover precious metals from printed circuit board and similar type wastes. The ERG Group of companies were able to supply a complete waste concentrating system which included the furnace, thermal oxidiser and flue gas cleaning. The process achieved 100 % thermal oxidation of any toxic components while maximising the recovery of the valuable precious metals from the waste.

The technology employed was from:

- ERG's Beverley range of furnaces and high temperature thermal oxidisers
- ERG's APC range of flue gas cleaning technology

System Description

The printed circuit board or similar waste is loaded on a batch basis into trays which are placed via side entry doors into the furnace. The control system incorporates a series of adjustable 'pre-sets' for each waste type, which ensure that the furnace is fired up and held under controlled air conditions at the appropriate temperature throughout the pyrolyzing process.

This process vaporises the non-metallic components of the waste producing a hydrocarbon laden gas stream and leaving metal rich ash residue in the trays. This concentrated waste is then suitable for further processing to recover the valuable precious metals.

The off-gases then pass into an oxidiser chamber where gas burners add heat and combustion air to ensure thermal oxidation of the volatile organic compounds (VOCs).

This fully oxidised flue gas contains sub-micron metal oxide particulate and halogenated gases and so is then drawn into the wet flue gas cleaning train for further treatment.

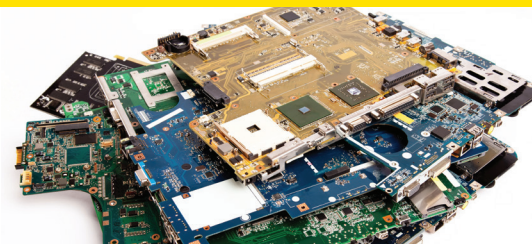
The flue gas is initially quenched in a refractory lined wet wall quench vessel which adiabatically saturates the gas reducing the temperature to 80°C. This rapid quenching prevents the formation of Dioxins and Furans.

The quenched gas is then treated in a variable throat high energy venturi scrubber which captures >98% of the sub-micron oxide particulate from the gas into the acidic scrubbing liquor.

This liquor is continually filtered through a hydraulic press which removes the captured particulate to produce a valuable metal rich dry cake which is then added to the concentrated ash residue from the furnace.

The partially treated flue gas is then treated in an alkali dosed packed tower scrubbing column which absorbs and neutralises the acidic contamination from the gas. This alkali scrubbing liquor is continually cooled and so sub cools the exhaust gases to 40°C condensing water vapour from the gas.

The treated gas which complies with the relevant emission regulations is then exhausted to atmosphere via a 20m stack.



Circuit boards containing precious metals



Concentrator trays in brick lined chamber



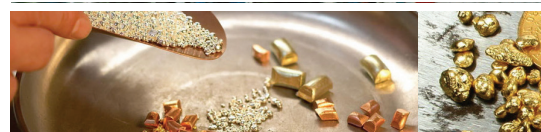
Concentrator chamber and control system



Oxidiser chamber



Flue gas treatment



Precious metals recovered

ERG's PRECIOUS METAL CONCENTRATOR SYSTEM

TO MEET YOUR ENVIRONMENTAL REQUIREMENTS FOR AQUEOUS AND GASEOUS EMISSIONS

