WASTE TO ENERGY

INTEGRATED SOLUTIONS FOR THE THERMAL TREATMENT OF TOXIC AND NON-TOXIC WASTE
Our proprietary Waste-to-Energy technology portfolio offers a solution for thermal treatment of different types of solid, liquid and gaseous waste, allowing power and heat production from the safe incineration of industrial, medical or other hazardous waste.

Whether it be as a general contractor, consortium partner, technology provider or engineering partner, our profound knowledge of fuel waste as well as its effects on plant design or operation is crucial for the successful implementation of complex Waste-to-Energy plants.

Depending on the nature and characteristics of the waste, our HELIOSOLIDS® fluidized bed and TURNOVER® rotary kiln incineration technologies are designed for safe waste destruction and maximum energy recovery.

WASTE TO ENERGY: FROM DESIGN & BUILD TO OPERATION & MAINTENANCE

WASTE TREATMENT

In spite of all efforts to reduce, recycle, recover and reuse waste, there will always be waste products of industrial activities. While HELIOSOLIDS® fluidized bed incineration is particularly adapted for the staged combustion of sludge, oily sludge and slurries as well as shredded waste, our TURNOVER® rotary kiln is specially designed to treat mixes of solid, liquid or gaseous industrial, hazardous as well as hospital waste.
“A ONE-SIZE-FITS-ALL SOLUTION FOR A WIDE RANGE OF INJECTED WASTE STREAMS”
SLUDGE INCINERATION

Bio-solids like municipal sludge, industrial sludge and fine solids can be incinerated with the advantage of eliminating the organic matter. Depending on the calorific value of the sludge being incinerated, pre-drying of the sludge, pre-heating of the combustion air as well as the use of an auxiliary fuel may be necessary. Energy from the incineration process can be recovered as green energy source for thermal sludge drying.

HELIOSOLIDS® fluidized bed incinerator

The HELIOSOLIDS® fluidized bed reactor is a fluidized bed furnace for the staged combustion of wastewater sludge, bio-solids, industrial sludge and fine solids. The reactor features integrated heat recovery, a stable fluidization and combustion process, and integrated flue gas cleaning.

FLUIDIZED BED INCINERATOR

A fluidized bed is a sand bed through which air is blown vertically from bottom to top at a speed that keeps the individual sand particles floating. The HELIOSOLIDS® fluidized bed reactor is a so-called bubbling bed, which means that the fluidization air speed is such that the particles are not carried away with the air. The sand bed behaves like a boiling liquid.

Sludge is introduced in the reactor just above the bed. The fluidization air is injected in the sand bed using a specially designed distributor plate that has to guarantee an even distribution of the air in the bed, and to avoid that sand flows back in the air duct. The organic solid fraction of the sludge is thermally oxidized generating a high temperature, while the remaining water in the sludge is evaporated. The inert solid fraction of the sludge is elutriated with the combustion gases, and will be captured in the flue gas treatment.

APPLICATIONS HELIOSOLIDS®

- Municipal and industrial WWTP sludge
- Oily sludge and slurry
- Spent grains
- Paint and paint sludge
- Shredded wood and pellets
- Biosolids
- Meat and bone meal (MBM)

ADVANTAGES HELIOSOLIDS®

- Total destruction of sludge
- Energy recovery from combustion process
- Flexibility in operation and injected waste streams
- Perfect combustion
- High ROI
- Low flue gas emissions
“A ZERO TOLERANCE SOLUTION FOR TREATING HAZARDOUS & MEDICAL WASTE,”
MEDICAL AND HAZARDOUS WASTE

Waterleau has developed an incineration technology designed to treat specific waste flows that cannot be treated in a grate or fluidized bed furnace. For the treatment of hazardous waste, Waterleau has designed a TURNOVER® rotary kiln. The slowly rotating kiln allows a continuous mixing of its waste content and a perfect combustion of solid and liquid hazardous waste. Higher concentrations of sulphur and chloride in these types of waste require a more sophisticated flue gas cleaning, designed by the Waterleau Air treatment engineers.

TURNOVER® rotary kiln

The TURNOVER® incinerator is of the rotary kiln type, i.e. a horizontally mounted, slowly rotating metal tube with an internal lining of refractory material. The incinerator is particularly adapted for the treatment of high risk medical waste and packaged hazardous industrial waste.

RO槟ARY KILN

One of the unique features of the TURNOVER® incinerator is that the incineration process inside the kiln takes place in a so-called reducing atmosphere. The waste is thus subjected to a gasification process with controlled addition of combustion air, so that the solid waste is converted to combustible gases (CO, H₂, ...) and solid ash. This gasification process allows for a higher efficiency and lower temperatures inside the kiln. The TURNOVER® rotary kiln can accept liquid or slurry waste and also toxic waste. The solid residues of the combustion process are evacuated by the bottom ash extractor equipped with a water lock, to avoid entry of outside air. The combustion gases are burned out completely in the post-combustion chamber (PCC) so that the gases reach the legally required temperature of at least 1100°C for at least 2 seconds.

APPLICATIONS TURNOVER®

- Mixtures of liquid, gaseous, solid wastes, sludges
- Toxic or hazardous waste including medical waste
- Small to medium capacity (250 kg/h to 6 TPH)

ADVANTAGES TURNOVER®

- Wide range of heating value: 3 to 45 MJ/kg
- Destruction efficiency >99,9999 %
- Low emission levels for CO, NOx, CxHy
- Efficient energy recovery w/wo air preheater
- Turn-down ratio of 1/3
THE MEDIPOWER® PLANT: SAFE INCINERATION OF TOXIC WASTE

Waterleau has built the MEDIPOWER® plant for Indaver in the port of Antwerp. This installation treats solid and liquid hazardous waste, and actively kills all pathogens and transforms the dangerous chemical substances into harmless components.

The MediPower® Plant, with a capacity of 30,000 tons per year, is capable of treating all specific medical waste generated in Belgium (approx. 10,000 tons per year). The rest of the capacity is filled with packaged hazardous industrial waste (metal or plastic containers up to 200 liter) and hazardous liquid waste (both high-calorific and low calorific waste).

In many aspects this project is very innovative:

- The waste to be treated is packaged and the packages are fed as whole, without, breaking them or opening them.
- Unique combination of treatment of different solid and liquid hazardous waste flows.
- The combustion process in reducing atmosphere (gasification).
- The flue gas cleaning using limestone (and not lime).
- Integration of the steam system in that of the two other incinerators on site.

The new incinerator in the Antwerp harbor is one of the largest in the world making use of the latest technology for hazardous waste treatment and featuring state-of-the-art air treatment design. Fully automated feeding lines reduce human intervention and contamination risks to a minimum. Hazardous waste is turned into energy in a proven-concept and absolutely safe design, meeting the requirements of waste producing industries by offering sustainable solutions and contributing to the green and recycling society.

INDAVER PLANT ANTWERP

- Plant capacity: 30 000 tpy
- Thermal capacity: 14 MW
- Power production: 2,3 MWe
- Steam flow: 15 tph
- Flue gas flow: 30 000 Nm³/h

1. Reception of waste
2. Elevators and boxfeeder
3. TURNOVER® rotary kiln
4. Post combustion chamber (PCC)
5. Steam boiler
6. Electrostatic precipitator
7. 2 stage scrubber
8. Dioxin absorption
SAFE AND CLEAN TECHNOLOGY FOR THE PRODUCTION OF GREEN ENERGY OUT OF INDUSTRIAL AND HAZARDOUS WASTE

DESIGN ENGINEERING CONSTRUCTION OPERATION MAINTENANCE

PROTECTING THE 4 ELEMENTS

We all have the responsibility to handle our natural resources in a careful and sustainable way. Waterleau develops environmental technologies and offers sustainable solutions for water, air and waste treatment, as well as for energy recovery. As an EPC contractor and operator, Waterleau counts more than 1000 references for municipal and industrial clients around the world.