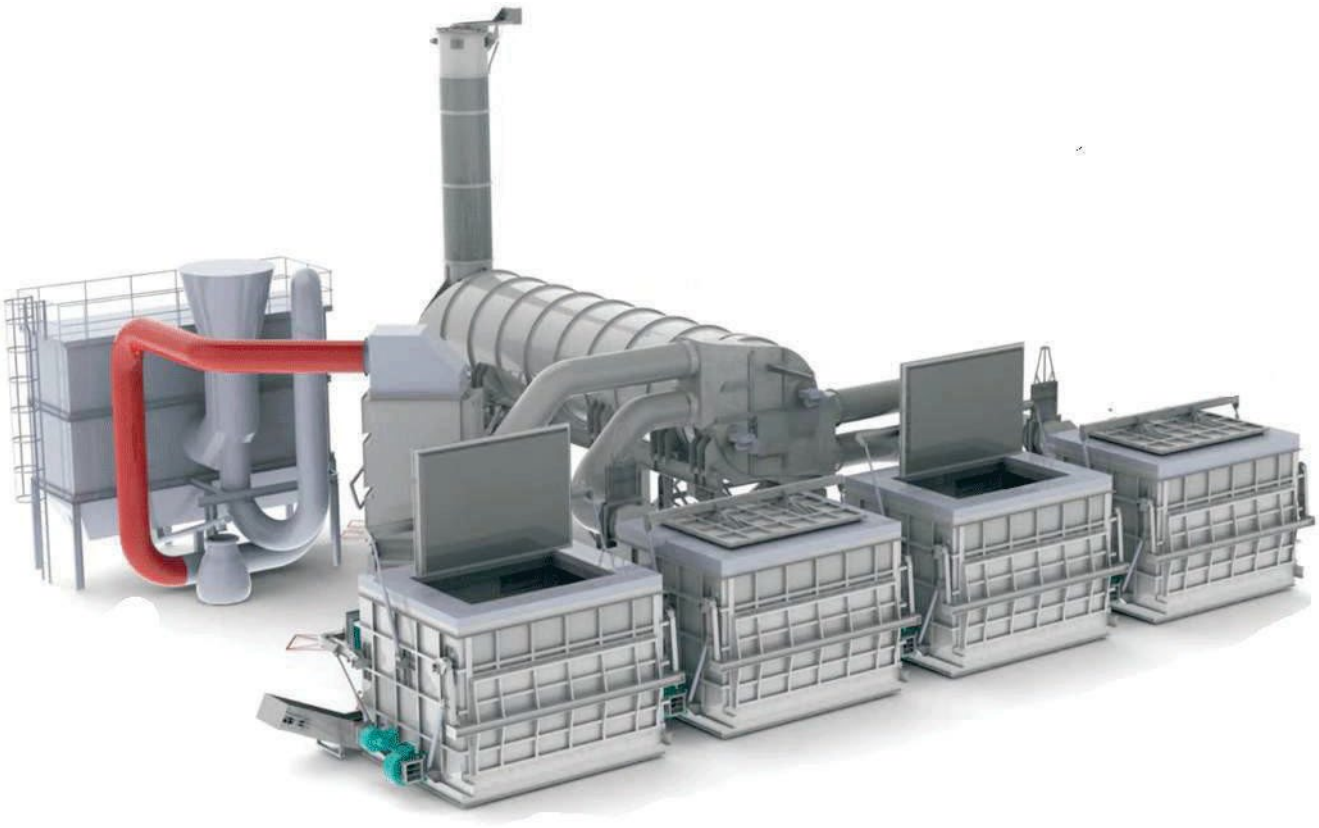
Batch Oxidation System (BOS)™



OVERVIEW

The BOS™ was designed as a low emission and low labour approach to small and medium-scale solid waste disposal. The BOS™ utilizes a gasification process which thermally converts waste products into a high value synthesis gas (syngas). This two-stage process provides the lowest possible emissions and is the most environmentally sound method for waste disposal. The unique modular BOS™ allows for flexibility of design, easy installation, and ease of operation. With capacities from 1 to 180 tonnes per day of waste processing, the BOS™ is ideal for small municipalities and private industries. By adding thermal recovery equipment, the hot effluent gas from the BOS™ can be used to produce steam and electricity

KEY FEATURES

- No expensive preparation of the waste: it goes into the BOS™ just as it comes off the waste collection truck.
- Gasification reduces waste to an inert ash with a weight reduction of up to 95%
  Modular construction of units handling from 1 tonne to 180 tonnes per day
- Low temperature gasification in sealed units produces syngas economically and minimises fly ash and NOx.
- Wide range of waste materials acceptable including tires.
- High temperature secondary oxidation ensures clean emissions in compliance with statutory legislation.

Waste to Energy BOS™ System with a capacity of 40,000 tpa and space to extend to 60,000 tpa

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Sequential Batch Process

While the BOS™ uses a "batch" process, rather than the continuous feeding of waste material, the systems is able to generate consistent and reliable amounts of syngas and heat, enabling it to generate electrical power continuously, 24/7.

As illustrated above, each BOS™ module is capable of processing 60- tonnes of waste per day, and consists of 4 Primary Gasification Chambers (PGC's) , each holding approximately 15 tonnes of waste. After being filled with waste, the chamber doors are sealed, and each chamber moves through its cycle of ignition, gasification, carbon reduction, and cool-down, completing this cycle in 24 hours.

By staggering the ignition of each of the 4 PGS's, this ensures that the module is at all times producing a rich flow of syngas, which is combusted in order to generate steam and electricity continuously. Where greater throughput or energy recovery is required, we simply build additional modules, each comprising of 4PGS's. Each of these modules has its own Secondary Combustion Chamber (SCC), its own boiler and Flue Gas Treatment System, providing incredible flexibility in terms of both operation and maintenance.

Sequential Batch Process

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Accepted Waste Types

Bailed Waste

Municipal Waste

Plastics & Rubber

Clinical Waste

Industrial Waste

Animal Remains

Oil Wastes

Chemical Waste

Wood & Paper Wastes

No other system is as flexible as the BOS™. Most combustible wastes can be accommodated, and there is rarely any requirement to pre-process the waste. The BOS™ has a proven track record with a wide range of non-hazardous and hazardous wastes, allowing the system to adapt easily to future changes in waste types and governing legislation.

BOS™ accepts most combustible wastes

- Municipal solid waste
- RDF, SRF & other MSW derivatives
- Industrial & commercial waste
- Construction & demolition
- Clinic & hospital waste
- Treated timber
- Confidential records
- Furniture
- Waxed cardboard
- Carpets
- Tires (whole or shredded)
- Fish and animal remains
- Wastewater bio-solids
- Particle board
- Pallets
- Railway ties
- Biomass crops
- Asphalt shingles
- Green waste
- Various hazardous wastes

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Flue Gas Treatment

The BOS™ is one of the cleanest thermal processes available, for the conversion of a wide range of hazardous and non-hazardous waste materials into valuable energy.

Unlike incinerators and other thermal processes, the BOS™ does not use a high temperature, turbulent processes to reduce the waste. The "quite", non-turbulent smouldering of waste during the gasification phase means that the production of fly-ash is almost eliminated, and the process does not suffer from temperature peaks and troughs, thus reducing problems with the formation of NOx and dioxins.

However, many waste materials contain chemical components which can cause problems in any thermal process. Acid gases and metals must be neutralised and or / removed, and dioxins, furans, and particulates must all be reduced to minute amounts in order to meet the stringent EU legislation and compliance requirements.

BOS™ achieves this by the use of a comprehensive Flue Gas Treatment (FGT) system through a dedicated Best Available Technology (BAT) program. The injection of sodium bicarbonate and activated carbon in a powdered form neutralises the acid gases and absorbs heavy metals and dioxins. Urea, injected into the Secondary Combustion Chamber, reduces NOx levels dramatically, and a bag-house filter system removes any last traces of particulate before the exhaust goes to atmosphere.

Note the unobtrusive emissions stack which extents only 6-metres above the ridge height of the building.

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Energy Recovery

HOW MUCH ENERGY CAN BE RECOVERED FROM ONE TONNE OF WASTE?

TYPE OF WASTE	CHARACTERISTICS	TONNES OF STEAM PER TONNE OF WASTE	KW HRS ELECTRICITY PER TONNE OF WASTE
Municipal	Household Waste	2.4 Tonnes	430 kW Hours
Municipal/ Industrial	50% Household 50% Industrial	3.6 Tonnes	650 kW Hours
Industrial	High CV Packaging Waste	4.7 Tonnes	850 kW Hours

Few people realise the enormous amount of energy, locked into municipal or industrial waste. Using the hot, exhaust gases from the Secondary Chamber, this energy can be converted into valuable steam, hot water, hot air or electricity.

The BOS™ uses tried and tested technology to harness this energy. Super-efficient boilers and steam turbines convert the hot exhaust gases into electricity and this process also generates large quantities of hot water, ideal for space heating, drying or chilling i.e. air conditioning.

As with any energy recovery system, the recovered energy is related to the fuel processed by the system: wastes with high moisture content and low calorific value will produce far less energy than those low moisture content and higher calorific values.

The chart (above) provides an indication of the amount of energy recoverable from one tonne of waste, although a full waste stream analysis must be undertaken to provide a complete waste characterisation in order to determine the true potential of the waste.

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Thank you for your interest in our product

For additional information please visit us at:

https://wwpllc.com/