

A MODERN TECHNOLOGY FOR MEDICAL WASTE TREATMENT BY PYROLYSIS SYSTEM “PyroMED”

ADVANTAGE OF TECHNOLOGY



This is complete solution for disposing of a variety Medical Waste:

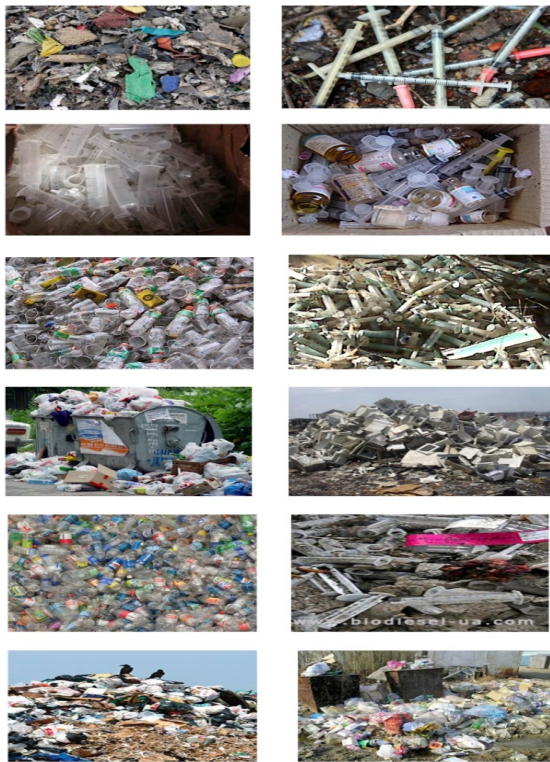
- **Environmentally Friendly – carbon neutral to slightly negative**
- **No air and surface water contamination**
- **Ultra-low emissions technology**
- **No pathogens, fliers, rodents**
- **Good public relation**

1T OF WASTE CAN PRODUCE

- **up to 4MW of heat**
- **or up to 1 MW electric energy**

Medical Waste Disposal Problems

For Today's Medical Waste Disposal Problems Laws and regulations imposed by local, state and federal agencies dictate that hazardous waste, contaminated with pathogen agents and infectious waste also known as bio-medical or regulated medical waste must be treated and disposed of in a safe and environmentally friendly manner.



Medical waste contains hazardous waste (for example plastics, textile, and rubber gloves, needles, pathological wastes from surgery and autopsy, and pharmaceutical waste).

Sharps - Contaminated hypodermic needles, syringes, scalpel blades, Pasteur pipettes.

Cultures and Stocks of Infectious Agents - Also called “microbiological waste”, this waste stream includes specimens from medical and pathology laboratories. Includes culture dishes and devices used to transfer, inoculate, and mix. Also includes discarded live and attenuated vaccines.

Human Blood and Blood Products - Also known as “liquid medical waste”, this waste stream usually encompasses waste blood, serum, plasma, blood products, and other potentially infectious materials.

Isolation waste - Generated by hospitalized patients isolated to protect others from communicable disease.

Contaminated Animals Carcasses, Body Parts and Bedding - Also called “animal waste”, this waste stream is relevant to animals or materials in contact with animals intentionally exposed to pathogens in research, biological production, or in vivo pharmaceuticals testing.

Existing technologies of the medical waste processing:

- Target use of certain components of sorted wastes, Warehousing on landfills
- Recycling by biological techniques
- Burning technique
- Buried
- Autoclave
- Pyrolysis – thermal processing in a hermetic reactor without or with the limited air oxygen feed
- Plasma pyrolysis

REQUIREMENTS to the ecologically safe, waste-free, and economically efficient technology of the complex recycling of the Medical Solid Waste

- Full transformation of the whole set of utilized wastes with a wide range of molecular weights with assurance of ecological purity of the resulting products;
- Maximum production rate of a reaction volume unit achieved by carrying out the pyrolytic reactions with maximum speed at the maximum yield of the output product.
- The ecological safety is the primary requirement imposed on modern technological processes of domestic MW processing. The adoption of the multiloop circulation pyrolysis principle in waste processing allows one to fulfill this requirement for the major part, in view of the deeper destruction of wastes. As a result, toxic high-molecular components are transformed into low-molecular ones, so that their toxicity reduces. Furthermore, toxic volatiles, which are present in the pyrolysis gas, are after-burned at a temperature of 1100–1200°C, so that provides dioxines and furanes completely decompose.

Pyrolysis as Recovering Value from Medical Waste

Pyrolysis is the decomposition of organic materials during heating in oxygen-free atmosphere to produce gas, liquid and solids. Decomposition products of the pyrolysis depend upon the heat, pressure and time the material is held within the vessel.

The pyrolysis technology increases recycling rates to reach higher profitability, to address environmental concerns, and to achieve governmental targets.

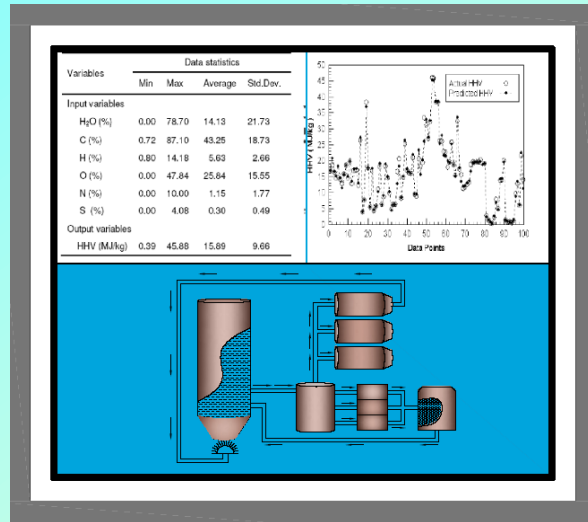
Increased possibility for recycling: a) Incineration: the only practical product is energy; b) Pyrolysis: gases, oil and carbonized materials. Gas, solid and liquid phases can further be used as a combustion fuel;

Emissions from pyrolysis are lower: most of the materials are recovered. Very little escapes into the environment. By displacing fossil-fuels, waste pyrolysis can help meet renewable energy targets, address concerns about global warming and contribute to achieving Kyoto Protocol commitments;

Pyrolysis systems could be developed for a wide range of capacities and a very wide range of wastes, recovering materials and energy from residues left from materials recycling, e.g. electrical and electronic scrap, tyres, mixed plastic waste and packaging residues;

Pyrolysis is the process that is relatively insensitive to its input material: It can accept e.g. unsorted MSW (Medical Solid Waste) and soil contaminated with dioxins.

Automatic Control Unit



The MWTP “PyroMED” control system is based on “real-time” microcomputer technology, guaranteeing high reliability and safe operation.

The main cycle phases and the machine’s actual parameters are displayed on the LCD panel during the cycle progress. The main physical parameters of the process, i.e. temperature, pressure, time and gas composition are controlled and displayed. The control system is easy to use and programmable.

Safety

Several risk situations have been analyzed that might occur during operation. Actions and technical solutions to be taken in such cases have been verified to eliminate or reduce risks in the most appropriate manner by adopting adequate protection measures

Operation

All control devices are clearly visible and the operating cycle has been designed to simplify and reduce as much as possible the need for operator's intervention. In terms of risk avoidance, the automatic operating system (automatic cycle selector) for the entire cycle guarantees maximum safety.

TECHNICAL SPECIFICATIONS

Thermal pyrolysis:	High temperatures and decomposed in the absence of oxygen
Heating method:	By clashes and friction of matter parts
Treatment cycle duration:	Continuous
Nominal waste disposal potential:	50-1000 kg waste/hour
Treated material aspect:	Different medial wastes
Humidity of waste	Up to 70%
Treated material final volume:	About 1% of initial volume
General control system:	Programmable logic controller (PLC)
Temperature measurement:	By resistance variation sensors
Dust abatement:	In humid environment
Electrical power supply:	Requires no external power supply

GENERAL VIEW OF THE INSTALLATION

