

SUTCO® REFERENCE.

MECHANICAL BIOLOGICAL TREATMENT (MBT)

LOCATION: KIELCE, POLAND

CONSERVING RESOURCES THROUGH
INNOVATIVE ENVIRONMENTAL TECHNOLOGY.



GENERAL DESCRIPTION: PROCESS OF MECHANICAL AND BIOLOGICAL WASTE PROCESSING

Waste processing starts at the ZOK Acceptance Hall where problematic waste (large pieces of construction waste, metal waste and large-size waste) and hazardous waste are pre-selected automatically from the mixed municipal waste. Next, waste is provided to the sorting cabin through the bag-tearing machine where the entire stream of waste is placed on 2 sorting conveyors where hazardous, large-sized waste, plastic films/cardboard boxes as well as glass packagings and large-sized elements, which might interfere with the sorting process, are separated in a preliminary manner.

Next, the entire stream is directed to the screening system on 3 rotary drums and one flip-flow screen to divide the stream of waste into individual fractions according to the particle size before feeding them onto the processing line for further recovery of materials.

Oversize fraction, i.e. above 300 mm is returned for calibration <300 mm to a box separated in the HOZOK hall and is next directed to a preliminary crusher and fed again onto the sorting line.

Fine fraction, i.e. 0-50 mm, which, after separating ferrous metals and after being divided into 0-15 mm and 15-50 mm fractions on the flip-flow screen, reaches the fermentation preparation station going previously through the organic fraction optical sorter and a ballistic drum separator which separates the mineral fraction from the organic one. After the fermentation process, the organic fraction will be directed to the stabilization process in the dynamic BIOFIX system.

Medium fraction, i.e. 50-300 mm, the most important one from the point of view of the recovery of materials, is first directed to the plastic optical sorters;





separated plastics are then fed to 2 ballistic separators where they are divided into the light and flat fraction, i.e. 2D and the light-heavy rolling fraction, i.e. 3D. The 2D fraction separated by the ballistic separators is directed to two optical sorters for films that positively separate plastic films which are then transported to the material cleaning cabin for further cleaning and sorting into individual colours. The 3D fraction which was separated on the ballistic separator undergoes further opto-pneumatic separation the so-called NIR cascade which consists of 3 separators that successively separate 6 fractions of materials: PET divided into 3 colours, PE/PP and Tetrapack which are then provided to the material sorting cabin for further cleaning.

The fraction remaining after the separation of plastics on the sorter is directed to 2 optical sorters for paper. The positively separated paper fraction is further cleaned in the sorting cabin. The waste remaining after the paper fraction separation is transported to the RDF separator using the system of conveyors after prior separation of non-ferrous metals on the non-ferrous metal separator. The high-caloric frac-

tion is transported to the storage device and next to the alternative fuel preparation station. The remaining waste is directed to the organic fraction optical sorter. The positively separated organic waste is fragmented and then transported to the fermentation input preparation station.

After the completed fermentation process, the fraction is automatically transported to the dynamic composting station in the BIOFIX system.

In the biological hall, the processing is automatic - turning, aeration and hydration, which allows for the most effective stabilization or composting of the waste. The process takes place in composting channels which prevent the mixing of organic waste from a separate collection with the fraction separated from mixed municipal waste. After the end of the process, the material is automatically unloaded from the hall using the conveyor system and delivered to the maturation yard. Depending of the composition of the input material, the dynamic tunnel composting system allows for the creation of top quality compost or biologically stabilized mass which can be used for remediation.

SPECIFICATIONS OF THE MBT SYSTEM FOR KIELCE

The MBT system for PGO in Kielce was constructed as part of the project entitled "The design and construction of a Waste Disposal Facility for the City of Kielce and the Kielce District in Promnik near Kielce within. The basic aim of the project is the achievement of applicable waste disposal and storage standards resulting from EU directives and also the reduction of economic and social differences between European Union citizens.

The supplementary objective is the economic effectiveness of the project connected with the optimization of the Waste Disposal Facility.

DESCRIPTION OF PLANT TECHNOLOGY

The proposed innovative plant technology involves the comprehensive multi-directional and advanced processing of municipal waste starting from the mechanical sorting area with a designated area for alternative fuel production and baling through fermentation up to biological stabilization and composting in a dynamic system.

THE FOLLOWING AREAS/INSTALLATION SYSTEMS CAN BE DISTINGUISHED WITHIN THE COMPREHENSIVE PROJECT:

- Installation for accepting and preparing waste for further processing.
- Installation for mechanical waste sorting based on automatic and a highly effective optical separation system combined with ballistic separation.

- Installation for alternative fuel production with pre-set parameters.
- Installation for packaging and baling raw materials.
- Installation for fermenting (not included in the scope of Sutco Poland's delivery).
- Installation for stabilization of the biodegradable fraction based on the automated dynamic BIOFIX system closed in a hall.

The processing line for the mechanical and biological processing of waste has been equipped with:

1 bag tearing machine, 3 sieve drums, sorting cabins, 3 ferrous metal separators, 2 non-ferrous metal separators, 12 optical sorters, 1 system for on-line RDF fraction analysis, 2 strip ballistic separators, 2 drum ballistic separators, 1 flip flop screen, 1 low-speed rotating crusher, 1 vibrating chute, 1 compressor station, 1 process control and visualization system, 2 automatic channel presses, automatic ballast loading stations, 1 RDF fraction crusher, 1 automatic compost turner, 1 input loading system and 1 unloading system for stabilized waste, 1 loading system for stabilized waste, 1 sludge transfer system, 1 system for transferring material for maturation, 1 system for feeding input to fermenters, 1 system of conveyors connecting individual devices.



MBT SYSTEM FOR KIELCE

SUTCO®'S COMPREHENSIVE AND STATE-OF-THE ART SOLUTION FOR THE PROCESSING OF MUNICIPAL SOLID WASTE.

CUSTOMER:

Waste Management Company Przedsiębiorstwo Gospodarki Odpadami, Kielce, Poland

LEAD TIME:

December 2012 - July 2016

INVESTOR/USER:

Miejskie Przedsiębiorstwo Gospodarki Odpadami Sp. z o.o. in Kielce, Poland

THROUGHPUT:

SORTING PLANT: 29 Mg/h mixed municipal waste
COMPOSTING PLANT: 25,000 Mg/a

SCOPE OF WORK:

Technological design, production, completion, delivery, installation, start-up, training, servicing, post-implementation assistance.

TYPE OF SYSTEM:

Europe's first innovative comprehensive MBT system which meets the required criteria and allows the objectives set for municipal waste management for the year 2020 to be met.

A multifunctional, fully automated system for sorting mixed and selective municipal waste from various collection systems with the automatic separation of raw material fractions at a level of over 90% of their content in the waste stream provided onto the line. A biological stabilization system with the dynamic BIOFIX system cooperating with the fermentation system.





CHARACTERISTICS OF THE MBT

A COMPREHENSIVE MBT SYSTEM PREPARED FOR WASTE MANAGEMENT OBJECTIVES:

- ▶ An **automated sorting plant** with the capacity of 100,000 Mg/a, integrated with the fermentation system and an automated biodegradable waste stabilization system in the BIOFIX closed system (25,000 Mg/a).
- ▶ **Maximum recovery:** even up to over 90% of the material fractions contained in mixed waste recovered as material fractions for recycling and as a high-caloric fraction with pre-set quality parameters.
- ▶ **Minimization of the amount of waste** sent to a landfill site after the MBT process.
- ▶ The system is adapted to potential further extension in the future **in accordance with the changing needs**.
- ▶ The best available MBT technology that has been tested on multiple occasions - it complies with applicable **legal requirements** and is recommended for medium-sized and large cities.



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