BioMRF Technologies Inc.

In-Vessel Fully Automated Tunnel Composting System

BIOMRF™
Technologies Inc.

Modularity allows for expansion

The **Ecomaster Biotunnel Technology** is based on a modular in-vessel system, which can be used in a variety of applications:

- **Composting** of separated municipal organic waste, commercial food waste, yard waste, digestate from anaerobic digestion, biosolids from waste water treatment and manure
- **Biodrying** of biosolids (weight reduction), green waste (renewable energy production) and mixed MSW (waste-to-energy)
- **Stabilization** of mixed MSW (mechanically sorted or unsorted)
- **Pathogens control** for organic waste and animal by-products.

Versatile in treating different materials

The main component of the biological reactor is a tunnel made of reinforced concrete with a sliding front door, an aerated floor and two vents. The system automatically provides the required amount of process air, which is an **accurate mixture of fresh and exhaust air**, to the biomass contained by the tunnels.

Tailor-made to suit your requirements

In addition to its air duct system, each biotunnel includes a dedicated blower and automated dampers for the metering of the flow of fresh, exhausted and recirculated air.

The process is static, thus there are **no moving parts inside the tunnels**, which would be subject to fatigue, wear and corrosion. The tunnels are loaded and unloaded by wheel loader, which makes the system simple to operate and very reliable.

With the tunnel loaded and the door closed, an intensive composting process is started by adding a metered flow of fresh air.

The process is maintained for the time necessary to reach the desired stabilization level of the organic material or, in biodrying applications, the moisture content specified for the product.

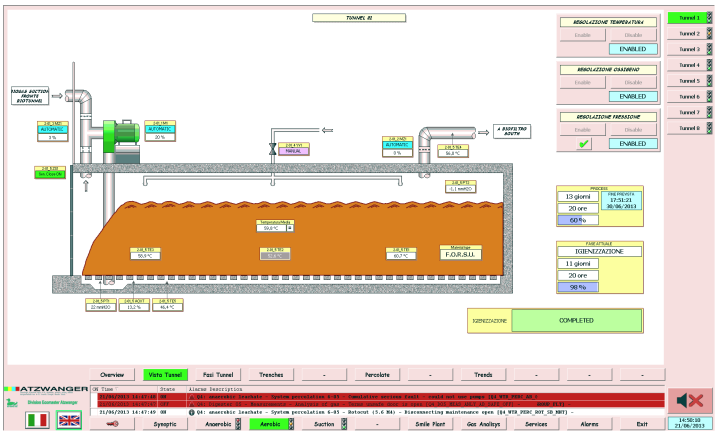
Controlled odor and run-off liquid

The temperature inside the biotunnel is maintained to the level set for each phase of the process by balancing the **self-generated heat** deriving from the biological process with the cooling caused by the evaporation of water.

Temperature barrier for pathogens control

In every aerated composting system, metering the flow of fresh air is extremely important because the addition of air causes conflicting effects: on one hand oxygen supports the **aerobic biological process**, which generates heat, while on the other fresh air cools the mass, mainly due to evaporation of its moisture. Due to these opposite reactions, advanced software is required to control the process.

The Ecomaster system uses a **proven software**, based on the FLC concept (Fuzzy Logic Control), which conducts a real-time analysis of the various process parameters (temperature, pressure, oxygen concentration, etc.) and operates the system based on a set of weighed rules. The software is a proprietary design.



Generally, the material to be treated requires to be mixed with structural material, such as shredded wood waste, to provide adequate **air permeability**. This is particularly necessary in the treatment of source-separated food waste (municipal or commercial) and biosolids.

Wood does not degrade significantly in one process cycle of the biotunnel system (typically in the range of 10 to 14 days), thus the greatest part of the **structural material can be recovered** at the end of the process and recycled for the preparation of a fresh batch.

Waste air exhausted from the biotunnel is mixed with air coming from the hall (always maintained in slightly **negative pressure conditions**) and processed in a centralized odor control system, typically consisting of one or more blowers, an air humidifier and a biofilter.

To reduce the size of the odor control system and **limit the electric energy consumption**, hall ventilation air is used as fresh air for the biotunnel process.

Air biofiltration, a **natural process** requiring the addition of no chemicals, is very efficient in **controlling the odors** generated by the composting process and does not require much electric energy, because of the low pressure drop of the biofilter bed.

Odor issues have often been raised by the nearby communities when the process is conducted outdoors using open systems.

The experience in Europe, where in-vessel composting systems have been used for decades due to the scarcity of land, proves that the combination of advanced biotunnels, enclosed halls and properly-engineered biofilters have changed the reputation of this **environmentally friendly process**.

BIOMRF™
Technologies Inc.

Proven in more than 100 units

User-friendly interface

Outstanding weight reduction

Powerful and energy efficient

No internal moving parts

BioMRF Technologies Inc.

10620 Treena St, Suite 230 San Diego, CA 92131

Tel. (858) 935-6070
Fax (858) 935-6001

biomrf.com

email contacts:
info@biomrf.com
sales@biomrf.com
service@biomrf.com