

**BioMRF**

# **Tunnel Composting Systems**

Modularity allows  
for expansion

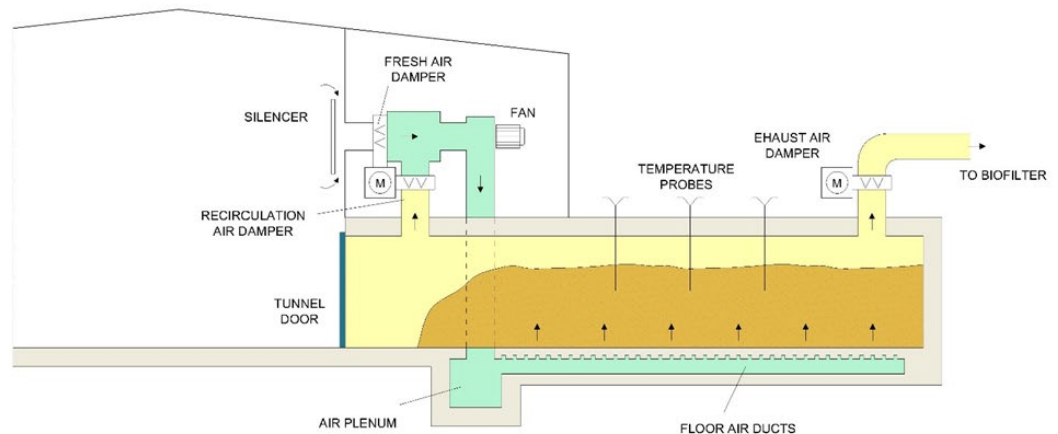
**Tunnel Composting Technology** is based on a modular in-vessel system, which can be used in a variety of applications:

- **Composting** of separated municipal organic waste, commercial food waste, yard waste, digestate from anaerobic digestion, biosolids from wastewater treatment and manure
- **Biodrying** of biosolids (weight reduction), green waste (biomass for renewable energy production) and mixed MSW (RDF, 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 tunnel includes a dedicated fan 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.

The temperature inside the tunnel 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. Due to these opposite reactions, an advanced PLC software is required to control the process.

The operator can follow the progress of the process in each tunnel on the monitor of the **supervision PC**, which stores the data relative to the variations of temperature of the treated material.

Controlled  
odor and  
run-off liquid

Temperature  
barrier for  
pathogens control



Successfully proven

Generally, the material to be treated requires to be mixed with a bulking agent, 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.

User-friendly interface

Wood does not degrade significantly in one process cycle (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 tunnels is mixed with air coming from the hall (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 process.

Outstanding weight reduction

Air biofiltration, a **natural process** requiring the addition of no chemicals, is very efficient in **controlling odor** 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 combination of advanced composting tunnels, enclosed halls and properly engineered biofilters is an **environment-friendly solution**.

Powerful and energy efficient



No internal moving parts

