BIOTIM® DRY AD

TURNING ORGANIC FRACTION OF HOUSEHOLD WASTE INTO NEW ENERGY
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Waterleau has developed a specific solution for the treatment of Organic Fractions of Municipal Solid Waste (OFMSW). Its heterogeneous and seasonal composition requires a very specific treatment. Waterleau has designed a state-of-the-art BIOTIM® Dry AD reactor, capable of treating this type of waste.

ORGANIC FRACTIONS OF MUNICIPAL SOLID WASTE

In regions with a strong public awareness for the need to separate different types of waste (Europe, USA, Hong Kong, …), municipal waste is collected and sorted in dedicated plants into different fractions. The Organic Fraction of Municipal Solid Waste (OFMSW), is often problematic. OFMSW is present in large volumes and not suitable for incineration nor landfilling. OFMSW is often heavily polluted by non-organic substances.

Due to the significant presence of garden waste (wood, soil, sand) and pollution, the organic content is limited to approximately 47% to 55% (on DS), versus 85 to 90% (on DS) for kitchen & restaurant waste. As a result, after a ‘natural’ anaerobic biodegradation, the remaining material (and anaerobic biomass) in the anaerobic digester is quite dry compared to wet AD systems: 25% DS up to 35% DS. It behaves like a semi-dry pasta. The BIOTIM® Dry AD system is especially designed to handle OFMSW.

BIOTIM® anaerobic reactor range: from wastewater to very concentrated organic waste
BIOTIM® DRY AD

The organic fraction of household waste is very heterogeneous and contains quite some impurities. An adequate pre-treatment to remove these impurities is thus necessary. The typical pre-treatment consists of a mechanical size reduction and an adequate screening to remove packing material. The oversize fraction contains most of the plastics, pieces of wood and big metal pieces. After pre-treatment, the screened material is transported to the heart of the system: the thermophilic BIOTIM® dry AD digester.

The thermophilic BIOTIM® Dry AD system is a 2-step system: the BIOTIM® Hydrolysis pre-digester is followed by the main BIOTIM® Dry digester.

PRE-TREATMENT

The BIOTIM® hydrolysis reactor is equipped with a horizontal mixing/propulsing system. The screened input waste is mixed with recycled active anaerobic bacteria coming from the BIOTIM® dry digester. The incoming waste receives a first hydrolysis step as preparation for the main BIOTIM® dry digester. The substrate is turned into a homogeneous mass for easier pumping, reducing the required energy. BIOTIM® Hydrolysis pre-digesting guarantees higher flexibility. The mixing, hydrolysis and heating can be adjusted independently and externally from the main digester.

FEATURES BIOTIM® DRY AD

1. FLEXIBILITY: SEASONAL FLUCTUATIONS
   In the summer, the OFMSW contains a high ‘wood & garden’ as well as a ‘grass’ fraction. These fractions are biodegrading slowly and tend to increase viscosity and dry solids. During winter, the grass and ‘wood & garden’ fraction is substantially lower. The overall % DS decreases in winter. In addition, it rains more in the winter, so if necessary, structure materials can be added.

2. FLEXIBILITY: VARYING DEGREE OF POLLUTION
   Even after pre-treatment, sand as well as smaller pieces of plastic and wood are present. The BIOTIM® dry Digester is suited for this type of material: the sand and remaining pollution are retained in the semi-dry anaerobic “pasta” and flow through to the system towards the output. The mixing, transportation and pumping systems are adapted in dimensions and material to handle this ‘pasta’.

3. A STABLE OPERATION
   In general, the higher the sand, soil and garden fraction is in the input, the higher the percentage of DS in the digester (between 22% and 35% DS in the reactor).
POST-TREATMENT

There are 2 options for post-treatment:

1. The semi-dry pasta coming out of the BIOTIM® Dry AD reactor can be mixed together with green waste ('structure material') to ensure the maturation of the biomass in an aerobic composting facility.

2. Or the semi-dry pasta coming out of the BIOTIM® Dry AD reactor can be dried in a Waterleau HYDROGONE® dryer and turned into a valuable dry organic fertilizer.

BIOTIM® DRY AD: A SOLUTION TO RETROFIT EXISTING AEROBIC COMPOSTING PLANTS

Today, there are still many aerobic composting plants. Organic Waste is turned into a compost (or a soil amendment) with a typical dry matter content of 70% by aeration. High amounts of electric energy are consumed to mineralize the organic matter and release $\text{CO}_2$ into the atmosphere.

By installing a BIOTIM® Dry AD System as a pre-treatment before the existing aerobic composting plant, a maximum of green energy is recovered from the organic material resulting in a much more sustainable solution.

The digestate (semi-dry ‘pasta’) of the BIOTIM® Dry AD reactor will be stabilized in the existing aerobic composting plant. Typically, the dry matter content of the digestate of a BIOTIM® Dry AD system is 25 - 35%. To compost this digestate, the digestate is mixed with structure material (such as shredded garden waste) just in front of the aerobic composting process.
BIOTIM® DRY AD FOR ORGANIC FRACTION OF MUNICIPAL SOLID WASTE

RETROFIT OF EXISTING AEROBIC COMPOSTING PLANT PLANT

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We all have the responsibility to handle our natural resources in a careful and sustainable way. Waterleau develops environmental technologies and offers sustainable solutions for water, air and waste treatment, as well as for energy recovery. As an EPC contractor and operator, Waterleau counts more than 1000 references for municipal and industrial clients around the world.

BIOTIM® DRY AD: A TURNKEY SOLUTION FOR BIOGAS PRODUCTION FROM THE ORGANIC FRACTION OF MUNICIPAL SOLID WASTE

PROTECTING THE 4 ELEMENTS

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