

# BioFusion™

## Integrated Single-Compartment Anaerobic Digester

***“Simplifying Waste-to-Energy for Sustainable Communities”***

### Technology

BioFusion™ is an innovative single-compartment anaerobic digester engineered to efficiently process organic solid and liquid waste from households, agriculture, and food industries. Unlike traditional multi-stage digesters, BioFusion™ integrates all four biological stages of anaerobic digestion—hydrolysis, acidogenesis, acetogenesis, and methanogenesis—into a single, compact reaction chamber, greatly simplifying construction, operation, and maintenance.

The digester features a durable dual-layer structure consisting of an inner PVC bag and an outer polyester-coated vinyl tarp that provides strength, UV protection, and chemical resistance. Designed to operate across both mesophilic and thermophilic temperature ranges, BioFusion™ ensures optimized methane yield and low maintenance operation. Locally manufacturable and cost-effective, this innovation offers a sustainable, decentralised waste management solution suited to African conditions, reducing reliance on imported systems while enabling clean energy generation.

### Market need

Organic waste streams from households, agriculture, and food industries represent a major environmental and disposal challenge. Conventional digesters often require complex compartmentalised systems, imported materials, and high maintenance, which increase costs and reduce accessibility in African contexts. There is a growing demand for affordable, durable, locally manufacturable digesters that can process waste efficiently while producing renewable energy in the form of methane biogas, supporting both environmental sustainability and energy independence.



### Features

- Single-compartment design
- Two-layer material system for UV, chemical, and abrasion resistance.
- Supports mesophilic (20–45°C) and thermophilic (50–65°C) operations.
- Reduces reliance on imported materials, cutting costs and supply delays.
- Ease of cleaning.



### Benefits

- Single-compartment design reduces complexity and costs
- Locally manufacturable, supporting regional economic development
- Dual-layer construction for strength, UV resistance, and chemical durability
- Operates in mesophilic and thermophilic ranges for efficient methane production
- Easy to maintain and clean, suitable for smallholder or industrial use



## Industry

Biotechnology

## Possible Applications

- Agricultural, household, and food industry waste treatment
- Renewable biogas production for cooking, heating, and power generation
- Off-grid or rural energy solutions
- Small- to medium-scale community energy systems

## Creators

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## Stage of development

Early stage

## Intellectual property

Patent Protection

## Desired relationship

Co-development Investor