

# Flexigester

The Black Clean and Green  
way to sustainable  
community development in  
the Global South

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# Flexigester

## Introduction

The Flexigester System has been developed to provide one simple solution to address many of the challenges facing communities in the Global South.

### **Sanitation**

Communities need access to better sanitation in order to prevent human waste becoming a source of disease. This is also a wasted resource.

### **Agriculture**

Rural farming and conservation agriculture urgently need access to plant nutrients and organic matter in order to sustain fertile soils and increase food production.

### **Fuel sources**

Many communities have no choice but to use wood for fuel. Population pressures and climate change are just two reasons why wood fuel substitution is needed.

### **Rural employment**

A significant part of the development story has to be the creation of employment. The Flexigester System is one tool that can help to provide a focus for self-help and self supported development within the community.

**The Flexigester System is the first rapid deployment anaerobic digestion system with a capacity of 10 tonnes and above.**

## Flexigester V10 System

The Flexigester System is a complete anaerobic digestion system delivered to you in a box. It is small enough and light enough that it can be delivered by air from the UK to your closest town. It will fit into the back of an estate car yet the Flexigester V10 has the capacity to treat up to 28 buckets (10L capacity) full of waste per day.



Once unpacked all that is required is a few simple steps and the Flexigester can be ready for use within a day. The installation needs only simple hand tools, no power and no waiting for concrete or cement to set.

**The Flexigester V10 System enables you to start building a better world in a matter of weeks**



# It's Black Clean & Green

## What is it?

The Flexigester V10 is an innovative anaerobic digestion system that can take materials such as animal manures, waste food, human waste and plants and convert them, over a period of several weeks, into natural Biofertiliser and Biogas.

The Biofertiliser contains plant nutrients, including those found in artificial chemical fertilisers, which can be used on the land.

The Biogas can be used as a fuel for cooking. A cleaner and more sustainable alternative to wood or charcoal.

The waste materials are not exposed to the atmosphere which prevents flies and vermin living and breeding on them.

## Installation

The Flexigester V10 System can be installed in a few hours. A shallow trench (18 m long 1.5 m wide and 0.5 m deep) is lined with the base membrane and the Flexigester body is unrolled into it. The gas pipe is cut to the required length and is used to connect the Flexigester to the Gas pressure regulator and then to the Biogas storage bag using the push and clip fittings provided. The Flexigester is then ready for use.



## Operation

Waste materials are added to the digester by gravity feed or using a simple roller pump. Two separate input pipes allow different types of waste to be introduced into the Flexigester. The waste may be blended with water prior to addition to make them pourable.

Once the digester is full, the level is maintained as the Biofertiliser output pipe acts as an overflow. The material that comes out of the digester may either be piped to another location by gravity or held in the Biofertiliser collector depending on the local circumstances.

The Biogas collects in the Biogas storage bag and from here it can be piped directly to the kitchen for use.

## Operating parameters

Waste input	Type	Kitchen waste, animal manure, human sewage
	Amount	Up to 280 L/day, 28 buckets full
Retention time	Minimum time	30 days
Biofertiliser output	Amount	Up to 101 t/yr
Biogas output	Amount	Up to 8 m <sup>3</sup> /day
	Equivalent to	Up to 9-17 kg wood/day

**Note** Output figures are dependent upon amount and composition of waste input and retention time and are given as a guide only



# Community Benefits

## Environmental protection

The Flexigester System contains the waste put into it in a totally enclosed environment.

Unlike the materials used in other systems the Flexigester is made from butyl rubber which is impervious to both liquids and gases. This stops waste water soaking into the ground and polluting soil and water courses and controls odours from rotting waste.

## Crop yield improvement

Most of the worlds soils are suffering from nutrient depletion and loss of organic matter resulting in declining crop yields. The Flexigester System creates a Biofertiliser by capturing the nutrients that were present in the waste inputs and returning them to the soil helping to increase crop yields and sustain fertile soils.



## Health gains



The Biogas produced by the Flexigester System is a smokeless fuel which does not cause smoke-related respiratory problems, as well as giving a cleaner kitchen and reducing the time needed to cook meals.

Treating waste in the Flexigester System prevents flies and vermin living and breeding on the waste which then reduces the spread of disease.



# Community Benefits

## Employment opportunities

Owning a Flexigester System can turn you into “business entrepreneur”. Depending on the community needs there may be opportunities to sell any excess biogas or biofertiliser, accept other peoples waste for treatment or even start a service to collect waste. The possibilities extend as far as the owners imagination.



## Water reuse

Waste water from kitchens and from latrines is often disposed of in pits where the water soaks into the earth and is lost. The Flexigester System retains all the water added to it allowing it to be put back on the land as liquid biofertiliser.

## Conserves wood resources

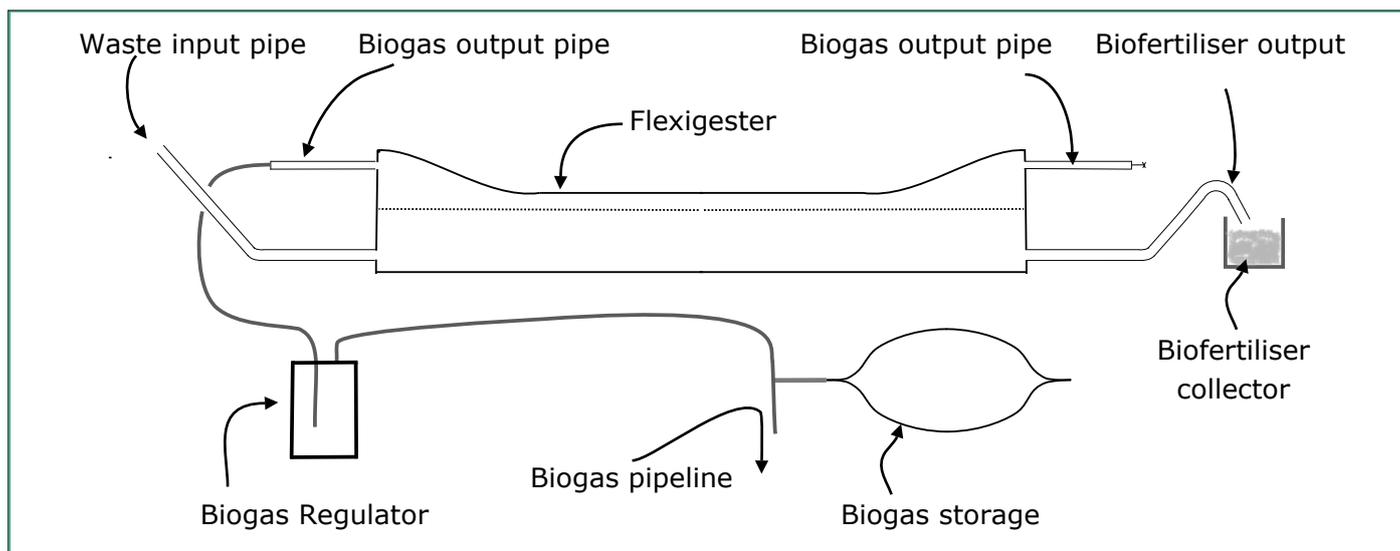


A product of the Flexigester System is biogas which is an alternative fuel for cooking. By using the biogas to cook a family’s meal the cost of buying or collecting wood, charcoal or kerosene can be saved.

# Flexigester Technical details

## Flexigester V10 System

The Flexigester V10 System is more than just a biogas digester. It contains everything needed to start treating waste and using the products it makes. Some additional items may be needed for some applications, such as a biogas stove and additional pipe but these are normally available locally or they can be supplied if required.



## Components

<b>Flexigester body</b>	the anaerobic digester for the treatment of waste with 2 input pipes, 2 biogas output pipes and 2 biofertiliser output pipes	Capacity 10 t Length 12 m Diameter 1.33 m Material Butyl rubber
<b>Biogas storage bag</b>	for the collection and storage of the biogas prior to use	Capacity 3.4 m <sup>3</sup> Length 3 m Width 2 m Material Butyl rubber
<b>Biogas Regulator</b>	to maintain a set pressure in the Flexigester	Size 20 x 40 cm Material Butyl rubber
<b>Biofertiliser collector</b>	for the collection and storage of biofertiliser prior to use	Size 120 x 80 x 47 cm Material PVC lined wooden crate
<b>Base membrane</b>	to line the trench under the Flexigester to protect it from sharp stones	Size 20 x 2 m Material Geotextile
<b>Gas pipe and fittings</b>	to connect the Flexigester to the Biogas regulator and storage bag	Length 10 m
<b>Feed collar</b>	to aid manual input of waste into the Flexigester	
<b>Complete system</b>		Packaged dimensions 120 x 80 x 47 cm No. crates 1 Approx. weight 135 kg

# Flexigester In use in Malawi

## Background

A Flexigester S14 System was installed in Namisu Children's Village in Malawi, near Blantyre in February 2014.

Namisu is a residential and day care centre and school for over 200 orphaned children. It is funded and run by the UK charity Aquaid Lifeline.

The Flexigester S14 was flown to Malawi and delivered to the village in the back of a pickup truck. Two days after it arrived on site the first waste was put in it.



## Current situation

The Flexigester is connected directly to a latrine block with pour-flush toilets used daily by the children. Waste from the kitchen and animal manure is also added to the Flexigester.

The Flexigester is producing Biogas which is transported to the kitchen where it provides the fuel for the Biogas stove used to cook meals for the children.

The Biofertiliser is being applied to compost heaps where it is improving the nutrient content of the compost. This compost will be used to fertilise the fields before planting.

The Manager of Aquaid Lifeline has reported that there have been no unpleasant smells, flies or vermin associated with the Flexigester and that it is simple and easy to use.





# Team details

## The Flexigester Team

Flexigester Systems have been designed and developed by Sustainable OneWorld Technologies C.I.C. (SOWTech) in joint partnership with Butyl Products Ltd who manufacture and distribute the systems.

### **Butyl Products Ltd**

[www.butylproducts.co.uk](http://www.butylproducts.co.uk)



**Butyl Products Ltd.**

Butyl Products Ltd are manufacturers and international suppliers of specialist liquid storage and distribution equipment and geomembranes.

They have been working with Global Aid Agencies, International Relief Agencies and National Governments since 1965, in emergency/humanitarian aid situations and as part of planned infrastructure development projects. They manufacture a range of supply, storage, treatment and water distribution systems and sanitation equipment including kits especially manufactured for emergency aid use and development.

### **SOWTech C.I.C.**

[www.sowtech.com](http://www.sowtech.com)



Sustainable OneWorld Technologies (SOWTech) is a Community Interest Company established to bring practical solutions to low and middle-income countries and aid and development situations in the field of sanitation and waste management.

With many years experience in organic waste management in both the UK and worldwide they design and develop products and processes with the advantages of western technology but which are practical for use in low and middle-income countries and in aid situations.

## Contact details

If you would like more information about the Flexigester V10 System or other Flexigester products please contact:

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