Operation Manual FSM AFWTU

Rohingya Refugee Camp Balukhali II, Camp 19

Content

Introduction

The AFWTU system, located at Camp 19 / Rohingya Refugee Camp near Cox's Bazaar, is a multi-stage treatment process system, containing mechanical, biological and chemical methods in order to treat the communal wastewater / human waste in the refugee camp Balukhali II.

For a normal operation shift of the AFWTU not more than two people people are required: A shift leader (skilled) and a second person. The desludging teams are considered separate.

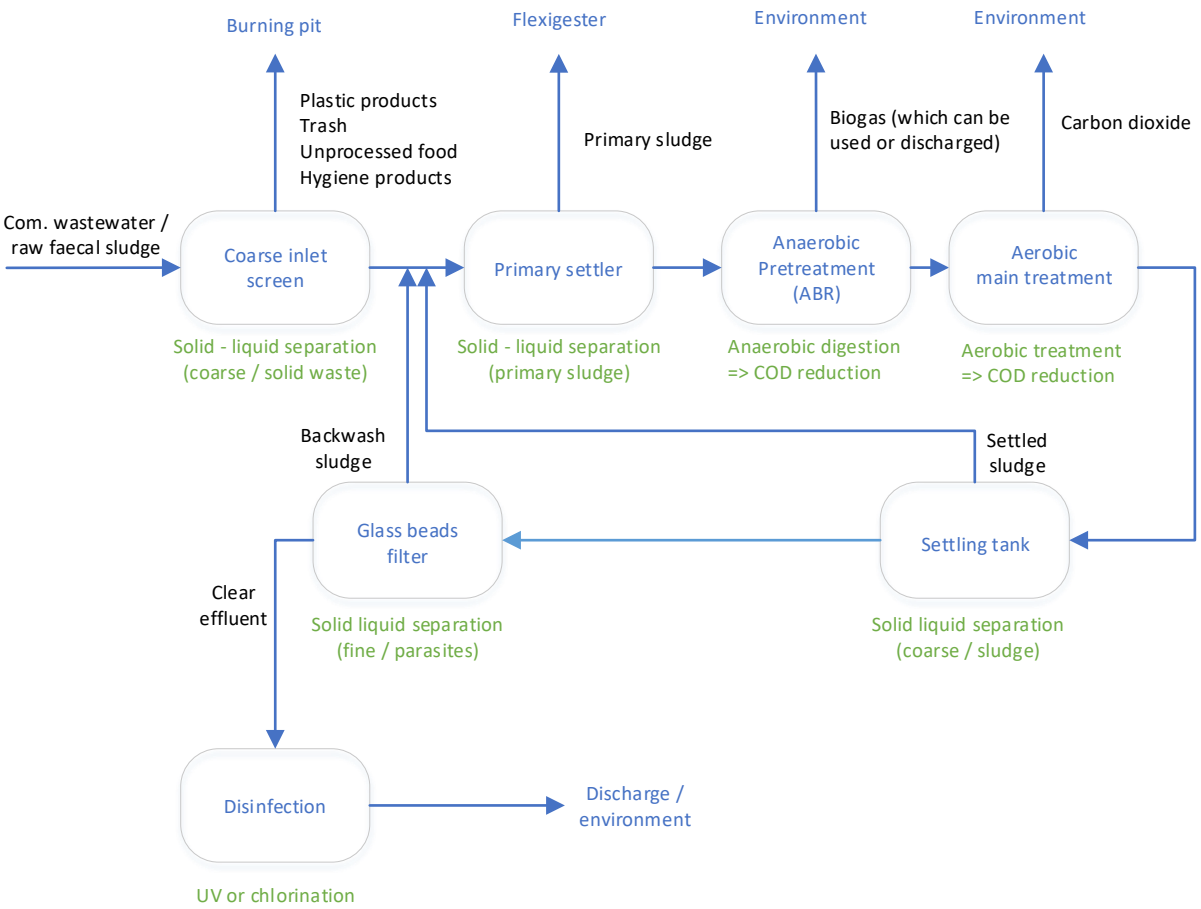
While the chemical and mechanical treatment steps can be process-wise easily started and controlled, the biological steps are more delicate and sensitive. If the active microorganisms die, it will take up to one month to re-start the system again until it reaches full treatment capacity.

Therefore, a few tasks are necessary to be carried out on a constant basis.

a. The aerobic bacteria in the aerated tank need oxygen to live and grow. Every stop of the **HydrO2** (aerator) longer than two hours will kill a certain percentage of the bacteria. Therefore even at night at least one **HydrO2** (aerator) has to run minimum every two hours for minimum half an hour. The better choice is to run all aerators 24/7. A small generator is sufficient (2 kW) for minimum operation at night. The energy requirement of the **HydrO2** is approximately 1.5 kW).
    i. If daily intake exceeds 5.000 L fecals sludge, one HydrO2 has to run permanently at night
    ii. If daily intake exceeds 10.000 L fecals sludge, two HydrO2 has to run permanently at night
    iii. If daily intake exceeds 20.000 L fecals sludge, all three HydrO2s have to run 24/7
b. The **Oloid** (mixer) makes sure that the aerated tank is mixed continuously, the oxygen is distributed equally and heavy particles are continuously stirred and do not sink down to the ground. The energy requirement is 0,25 kW. The **Oloid** should run permanently (24/7). If that is not possible, it has to run together with the **HydrO2**, also at night.
c. If the system is operated correctly, no bad smell appears. Always watch out if there is any bad smell and report the smell to the supervisor.
d. In order to make sure that the system works correctly, once every month samples have to be taken, tested and analyzed by the IFRC FSFL laboratory, located in Cox's Bazaar.
    - Inlet sample
    - ABR outlet sample
    - Effluent before chlorination
    - Effluent after chlorination

The following manual is for daily use. Every step mentioned has to be carried out on a daily basis, every day of the operation.

Flow Chart
IFRC – FSM - Camp 19 – Project
Cox's Bazar / Bangladesh



Black:	Solid, liquid or gaseous matter that is being transported or processed
Blue:	Locations of process or final destinations (reactor, environment)
Green:	Explanations and options

Safety at the workplace

Working at a wastewater treatment plant and desludging operation are activities that contain certain dangers.

Fecal sludge and wastewater is contagious and can cause significant harms to the human health and environment. The vast majority of diarrheal episodes is caused by microorganisms, transported and transmitted by human or animal feces (hand to mouth, poor water quality, vectors, poor food hygiene etc.).

At all times, personal hygiene has to be maintained at the highest possible level. Personal protection equipment has to be used whenever contact or potential contact with human feces can occur (desludging process, transport, emptying of the barrels and storage of the empty barrels).

The following personal protection equipment (PPE) has to be worn at all times described above:

- Safety goggles
- Butyl or rubber gloves
- Face masks
- Overall
- Rubber boots

At the beginning of shift breaks and at the end of the shift all PPE has to be cleaned and disinfected properly and stored away safely for the next day use. Handwashing, personal hygiene and disinfection of the hands is equally essential. The necessary facilities are provided by the BDRCS (s. picture 1)

Picture 1: Personal hygiene area

Furthermore, the same kind of precaution applies during the disinfection (chlorination) step of wastewater treatment. Chlorine is a highly aggressive, corrosive and harmful chemical agent. Therefore, the complete PPE is to be worn during the complete process of handling the chlorine until it is diluted in the disinfection / chlorination tank at the end of the wastewater treatment process.

For further information, please refer to the MSDS of the chlorine agent.

Visual inspection

Before you start any kind of operation at the beginning of a working shift, you start with a visual inspection of the whole site.

First task every morning is a visual inspection

- Does the area smell unusual? Does it smell bad?
- Are the solar panels clean? Dirty solar panels, covered with dust, have only an output of 50% of the maximum capacity. (s. picture 2)
- Is the **coarse inlet screen** empty (if not, empty screen to burning pit)? (s. picture 3)
- Is the connection from **primary clarifier** to **ABR** inlet free and where is the water level? (s. picture 4)
- Are there objects floating on the surface of the **primary clarifier** (if yes, remove)? (s. picture 4)
- Is water coming out of the **ABR** – outlet? (s. picture 5)
- Are the **Oloid** and the **HydrO2** – aerators running properly? (s. picture 6)
- Is there excessive foam floating on the surface of the **aeration tank** (if yes, suppress with water)?
- Are there any leakages anywhere?
- Is the **Flexigester** inflated? (s. picture 7)
- Is there oil in the **pressure regulator**? (s. pictures 8a+b)

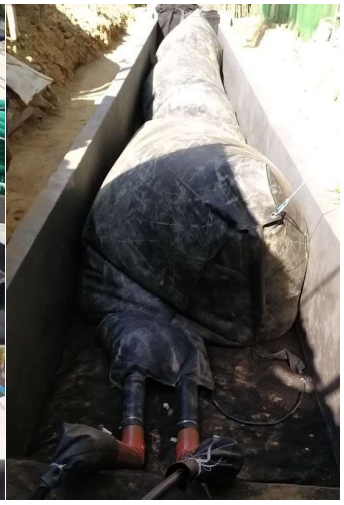
Picture 2: Dust on the solar panels

Picture 3: Dirty inlet screen

Picture 4: Screen, surface, water level

Picture 5: ABR outlet

Picture 6: Normal foam, running Oloid and HydrO2



Picture 7: Inflated Flexigester

Picture 8a+b: Pressure regulator and close up on oil filling

If all the above are in order, you can start the daily operation.

Equalize the water levels from aerated tank and settling tank

In order to take on new fecal sludge from the pit latrines, an equal amount of wastewater has to be discharged from the system. Therefore, start the daily operation with the opening of the **connection valve** (gravity valve) between the **aerated tank** and **settling tank** (s. picture 9).

After the levels are equal, close valve again. Now, you can start with the intake of new fecal sludge. Do not open the valve again until next morning. The incoming fecal sludge has to be processed for several days inside the **ABR**, the **ABR** effluent has to be treated inside the aeration tank for one day.

The water in the **settling tank** has now to rest and settle for two to three hours. During the two to three hours, activated sludge (brown colored flocs) will sink down and settle at the bottom of the **settling tank**. From there, they will be recirculated to the **aerated tank** via the **sludge pump** (the lower hanging pump).

During the two to three hours, the three filters will be backwashed, one by one (s. “Backwashing”)

Start with operating the **borehole pump** and fill up the **backwash tank** completely.

Picture 9: Gravity valves

Intake of new fecal sludge

Allow desludging teams discharge of barrels into **coarse screen filter** of the primary settling tank inlet (s. picture 3)

Control Inlet **Coarse Screen Filter** after every fecal sludge intake. Empty and clean the filter whenever necessary. Transport the large objects to the burning pit on site and burn it.

Fill out Daily Operation Sheet, keep record of the number of barrels emptied.

Make sure that the desludging team is aware of the imminent danger of contamination spread. Personal hygiene has always to be maintained at the highest possible level.

Picture 10: Emptying of barrels

Always control the water level at the connection between **primary settling tank** and **ABR inlet** (s. picture 4). If the water level is high, there must be water coming out of the **ABR outlet** (s. picture 5).

If the water level is high and there is no water coming out of the **ABR outlet**, there must be a blockage. Check if **ABR inlet** pipe is clean.

**Mechanical desludging preferable*

Operation of glassbead filters

The system contains three **glassbead filters** (s. picture 11). The piping system makes it possible, that one of the filters can be backwashed, even during operation of the other two filters.

Picture 11: Glassbead filters

Picture 12: Filter operation valve

Every filter has two possible water sources to choose from:

- Dirty water (for filtration) from the settling tank or
- Clean water (for cleaning / backwashing) from the backwash tank

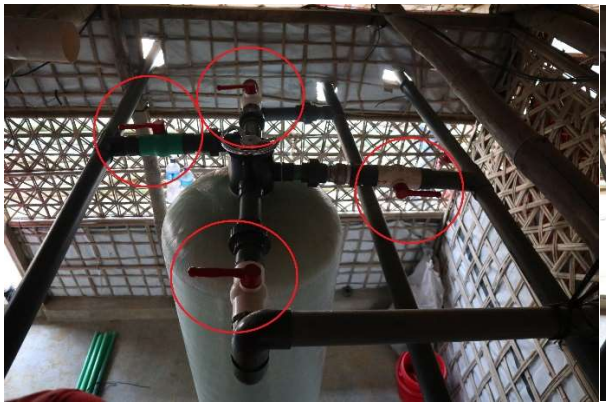
Therefore, every filter has two valves for the incoming water: Dirty water (white valves) and clean water (green valves). The **filter operation valve** will be set accordingly to “Filter” or “Backwash” (s. pictures 12, 13,14).

Pictures 13+14: Operation valve set on filtration or backwash

The general rule is:

Both white valves CLOSED, both green valves OPEN, filter operation valve “Backwash”: Backwashing (s. picture 14 + 15)

Both white valves OPEN, both green valves CLOSED, filter operation valve “Filter”: Filtration (s. pictures 13 + 16)



Picture 15: Valves set on “Backwashing”

Picture 16: Valves set on “Filtration”

Backwashing

Apply the following procedure (s. pictures 14 + 15):

- Choose a filter for backwashing (1, 2 or 3)
- Close WHITE filtration valve slowly
- Close WHITE dirty water valve slowly
- Open GREEN clean water valve slowly
- Open GREEN backwash valve slowly
- Set Manual Valve (top of filter) to position „Backwash“ (s. picture 12)
- Run backwash Pump for 5 minutes
- Observe the water coming out of the backwash pipe. It should turn from brown to colorless and from dirty to clean.
- Make sure that water comes out of the Backwash Pipe in a strong stream of a diameter of 5 cm, wait 5 minutes, turn slowly to position „Rinse“, wait 30 seconds, turn valve slowly to position „Filtration“, wait 30 seconds.

- Turn off backwash Pump
- Close GREEN clean water valve slowly
- Close GREEN backwash valve slowly
- Open WHITE filtration valve slowly
- Open WHITE dirty water valve slowly
- Check water level of backwash tank (the level of clean water may have been decreased due to previous backwash procedure), eventually, start borehole pump and fill the tank again before you start backwashing the next filter.

You can carry out this procedure at any time, whenever you feel one filter is stuck or blocked.

After backwashing, the filter should be free again and produce a high flow.

Recirculating sludge

After 2 – 3 hours of settling time and backwash procedures, start the **Recirculation Pump** (lower pump inside settling tank) and pump settled sludge from settling tank back to aerated tank.

Observe outlet. When outflow turns from dark-turbid to brown-clear, turn off the **Recirculation pump**.

If the amount of sludge settled gets too much over time (filtration process becomes difficult, filters get stuck after only a few minutes), direct sludge recirculation hose directly to primary clarifier. Let the sludge settle there, sludge at the bottom of the primary clarifier will later be conducted to Flexigester.

Filtration

S. pictures 13 +16.

- Open WHITE filtration valve slowly
- Open WHITE dirty water valve slowly
- Run **Effluent Pump** (upper pump in settling tank)
- Make sure that there is filtered water coming into the **Reaction Tank**.
- Water stream should have a diameter of at least 5 cm. If not: Report to WASH Officer.
- Add 2,5 teaspoon of **chlorine agent** in the water stream when filtration just started, 2,5 teaspoon after the **Reaction Tank** is ¼ full, 2,5 teaspoon when the tank is ½ full, 2,5 teaspoon when the tank is ¾ full (10 teaspoons in total)
- The exact amount of chlorine will be determined by the WASH officer in cooperation with the FSFL and may change over time according to the lab findings
- Whenever the filtration water stream gets thinner than a diameter of 2 cm, stop **Effluent Pump** and start the **Backwash** procedure again.
- When the water level inside the **Reaction Tank** reaches a level of 30 cm below the dome or 2,5 cm below the overflow discharge outlet, stop **Effluent Pump**
- Wait for 1 hour (reaction time in order to kill all pathogens)
- Open **Discharge Valve** and let the water flow into the creek
- When the **Reaction Tank** is empty, close **Discharge Valve** again
- Repeat all steps until settling tank level is at effluent pump. The exact amount may vary on the daily intake plan and can be altered by the WASH Officer.

Extra tasks to be carried out once a month

Discharge sludge from first Anaerobic Pre-Treatment Baffled Reactor tank (ABR)

- Check with bamboo stick if there is more than 30 cm of dense/hard sludge at the bottom
- Use submersible sludge pump on a rope OR primary sludge pump (diesel) in order to remove dense sludge from the bottom
- Use bamboo stick in order to stir sludge if the pump cannot transport the sludge
- Pump sludge to **Flexigester**
- Remove and clean submersible pump

Discharge sludge from primary settling tank

- Check with bamboo stick if there is more than 30 cm of dense/hard sludge at the bottom
- Use submersible sludge pump on a rope OR primary sludge pump (diesel) in order to remove dense sludge from the bottom
- Use bamboo stick in order to stir sludge if the pump cannot transport the sludge
- Pump sludge to Flexigester
- Remove and clean submersible pump

Power generator

- Conduct visual inspection according to Power Generator operating manual
- Check oil level
- Check cooling water
- Check air filter

Solar power

- Check electronic and control panel of solar system for all functions

Required Maintenance for AFWTU

All imported components are robust, durable and low maintenance as they are difficult to replace.

The assumed lifespan and maintenance requirements for the imported components are as follows:

Oxfam tanks:	Oxfam tanks require no maintenance. However, it is recommended to keep the tanks clean and free from rust. The expected lifespan of the butyl rubber inliner is: • Without roof (protection from sunlight): 5 years • With roof (protection from sunlight): Minimum 10 years
SiLi glasbeads:	Glasbeads require no maintenance other than properly backwashing when the filter gets blocked. The expected lifespan is minimum 10 years.
Oloid 400:	The Oloid 400 requires an “annual small maintenance” and in addition every two years a “gearbox maintenance”. The spare parts kits contain ball bearings, sealings and gears. The price for the annual small maintenance kit is 250 EUR, the price for the gearbox maintenance kit every two years is 450 EUR. Assuming that the maintenance works are carried out on a regular basis, the expected lifespan of the Oloid 400 is minimum 10 years.
HydrO2:	]The HydrO2 requires an “annual maintenance”. The maintenance kit contains ball bearings and other small parts. The price for the annual maintenance kit is 350 EUR. Assuming that the maintenance works are carried out on a regular basis, the expected lifespan of the HydrO2 is minimum 10 years.
Local components:	The quality and lifespan of the locally purchased components is difficult to estimate. However, in case of a technical failure, the components can be repaired or exchanged on the local market.

The tools for the “annual maintenance” as well as the “gearbox maintenance” for the Oloid and the HydrO2 are already on site. No special tools are required. The wear parts, ball bearings as well as the sealings can be replaced with standard tools. In case that one of the ball bearings is stuck, a ball bearing pulling tool might be useful.

Troubleshooting AFWTU

Properly operated the AFWTU runs for several decades without causing many problems as pretty much all activated sludge wastewater treatment systems around the world prove. Given the difficult circumstances in an emergency context and the low level automatization of the Bravo System at Camp 19, some necessary corrections of operation may occur:

Bacterial growth in the effluent after chlorination

The first reflex is always to increase the amount of chlorine agent, but the desired result may not be reached. In most of the cases it is not a problem of the chlorine amount, but proper mixing and reaction time (one hour). Please make sure that the mixing procedure is carried out as described in the “Filtration” section. At later stages it can be considered to add a recirculation pump (inflow from the bottom of the reaction tank, outlet at the top) in order to constantly mix the reaction tank. This will minimize the amount of chlorine needed. Please work closely together with the laboratory to minimize the chlorine amount in order to save operational costs as well as protect the environment.

Excessive foam on the surface of aerated tank

Under normal circumstances the foam on the surface can just be sprayed down with a hose. At later stages the installation of 4 – 6 showerheads at the rim of the tank (as done at the Camp 18 Alpha System), fed with fresh water, can be considered. This installation saved a lot of operational manpower at the Alpha System.

If the foam can not be handled that way (which never happened at the Alpha System) there is too much solid matter in the system. Check the bottom of the primary clarifier for excessive sludge and conduct the Flexigester.

Excessive flocs and sludge in secondary clarifier (settling tank) and aerated tank

Over time, the amount of sludge and flocs will increase. Please proceed as described in section “Recirculating Sludge”. Re-route the sludge to the primary clarifier and conduct to the Flexigester.

Overflow of one of the tanks

The system is gravity flow operated, so pump failure cannot be a reason. Please check all the connections, pipes and valves downstream the overflowing tank.

Operation of the Flexigester

Please refer to the original Flexigester manual as well.

1.0 What does a Flexigester need

1.1 There are a few things that the Flexigester needs in order to perform well. A Flexigester is home for many millions of microbes who live within it. These microbes are like other animals. You need to feed them, make sure they are not fed anything they should not have, make sure they enough to eat but not too much, and keep them warm, You need to think of the digester as an animal which cannot find its own food so you have to feed it.

1.2 The microbes in the Flexigester can use as “food” most wastes that would break down naturally. Examples of good foods for a Flexigester are human wastes, left over food from the kitchen or plate, animal manures, plant materials such as grass, leaves, soft roots, wastes for the slaughter of animals and soft papers such as toilet paper. However very dry leaves and woody plant wastes break down too slowly to be used in as food in a Flexigester.

1.3 There are certain materials which should not be put into the Flexigester because the microbes cannot eat them. You would not feed an animal something which is could not use as food and so the same is true for the Flexigester. If the material will NOT decompose or rot, it should not be put into the Flexigester. For example

- No stones
- No soil
- No sand
- No plastics
- No glass
- No metal

1.4 In addition to the list of things which do not decompose, there are some which decompose so slowly that you do not want them in the digester. Examples of such materials would be woody material or vegetation which is very slow to break down, such as big leaves of maize plants or similar. These materials are best kept for decomposing by composting.

- No sticks
- No wood
- No large or dry leaves

1.5	Like most animals Flexigesters like to be fed on a balanced diet. If possible a mix of wastes will generally make your digester perform better. So a range of materials which includes some animal waste (including human) AND some food or vegetable waste will work well. If you have kitchens please add the waste food such that in the washing up water or from trimmings. Waste from plants can produce a lot of gas.
1.6	In technical terms feeding a mixture of plant and animal waste gives a good Carbon to Nitrogen balance.
1.7	It is very important that your digester is “fed” with waste otherwise the microbes will be starved and that will mean that they do not produce gas.
1.8	The Flexigester is robust, and the microbes if starved the microbes will not die but the gas production will slow down and stop if they do not have enough food.
1.9	It is better if the waste is fed into the Flexigester a little at a time and regularly. If possible some waste should be added to the digester every day.
1.10	The amount of waste which should be fed into a digester will be different for every Flexigester as the wastes available will be different. The following are guidelines.
1.11	For every cubic meter of Flexigester capacity, the amount of “waste” it can process is usually between 15 to 25 litres per day. So, for example, a Flexigester with an operating capacity of 10 m3, the daily input of waste should be between 150 to 250 litres. This is a guideline figure only as the nature and “strength” of any given waste will vary.
2.0	Over feeding the Flexigester
2.1	It is possible to put too much waste into the Flexigester and overload the microbes and their environment so that they stop eating and breaking down the waste.
2.2	If you think that your gas production has slowed down or stopped due to over-feeding there is a test described below which will help to tell you if this has happened.
3.0	How to check if the Flexigester has “acid” indigestion
3.1	If a digester has been fed too much waste over a period of time, then it can stop working properly because the microbes cannot break down the waste fast enough to remove certain acids which form during decomposition.
3.2	Take some liquid, about a cupful, from the outflow. Add one teaspoon of bicarbonate of soda to this liquid. If the liquid fizzes a lot then the digester is too acid and this is cause of the problem.

3.3 If this happens, stop putting waste into the digester and just leave it. Retest the more liquid from the digester at intervals. After a period, and it may be many weeks, the Flexigester will start to produce gas again. Wait until gas production is strong before starting to feed again. If possible start to feed with a small quantity of waste and build up the amount of feed over a period of time.

4.0 Agitating the Flexigester

4.1 Causing the material to move by agitation, stirring or mixing will aid the breakdown of the waste and the release of the biogas from the waste.

4.2 The agitation tube is attached to one of the inflow pipes. It has a hand hold or handle at the end. This allows the tube to be lifted up and lowered.

4.3 The end of the agitation tube should be lifted as high as possible allowing the liquid in it to run back into the Flexigester. It is then lowered rapidly so that liquid flows back into it. This is repeated a number of times causing a wave action inside of the Flexigester which agitates the material in the Flexigester. This should be repeated at least twice daily

4.4 Before lowering the agitation tube check that there are no sharp objects or stones fallen into the trench that could puncture the tube.

5.0 The importance of temperature

5.1 The process of the Flexigester is dependant on the microbes being warm enough. The microbes that break the waste down evolved in the guts of animals like cows. They therefore like to live at body temperature. The best temperature for most microbes is around 37°C. If the temperature falls below approx 20°C then the process of gas production slows down considerably and will stop.

5.2 Heavy rainfall and waterlogged ground will reduce the temperature of the Flexigester by cooling the ground around it. If it is possible protect the Flexigester from heavy rain with a cover. Also if possible prevent the ground around the digester from becoming waterlogged, by digging a drainage ditch around it.

5.3 A transparent cover or tent over the Flexigester can also help with keeping the temperature high enough for best operation.

5.4 It is very unlikely that daytime sunshine will bring the temperature of a Flexigester high enough to be too hot for operation. Overnight cooling and the large volume of liquid in the Flexigester make this problem rare.

6.0 Using the Biogas

6.1 When there is a good supply of burnable gas it can start to be used for cooking with.

6.2 There are a number of gas bags in the kit. These can be filled by connecting them to the Flexigester, via the Gas Pressure Regulator. Always make sure that the taps are closed before disconnecting the Storage Gas Bags.

6.3 Never try to light a flame near to a gas bag. The gas bags should always be 5 m from a cooker or any other flame.

6.4 The bag which delivers gas to the cookers can be weighted down to provide enhanced gas pressure. Suitable weights for the bag would be old car tyres. The weights must not have any sharp or rough edges which could puncture the bag.

7.0 Using the Biofertiliser

7.1 Whenever waste goes into the Flexigester the same amount of biofertiliser will flow out at the other end.

7.2 This can be collected or treated in a number of different ways. These include:

- Stored in a tank or similar for direct use on land
- Piped directly to irrigation pipes or channels
- Stored in a tank or similar for removal off site for disposal.
- Piped onto a compost heap to provide nutrients and moisture

7.3 How the biofertiliser is best used depends on the project situation.

8.0 Daily checks

8.1 Check that there is no condensation in the gas pipelines. This can be removed by lifting the rubber pipe and allowing the condensate to run back into the Flexigester.

8.2 Check the Gas Pressure Regulator to ensure that the depth of liquid is correct. If there is too much water in the bag, empty some out until you have the correct depth.

8.3 Check the Flexigester visually for any damage or leaks. If any are found repair them. See troubleshooting section.

8.4 If the gas is not being used regularly for cooking it may need to be burnt off or vented to atmosphere to prevent the Gas Bags becoming too full. Ensure that the area is well ventilated and that there are no naked flames nearby when venting the biogas.

8.5 Check that there is no liquor in the overflow tank. Any significant liquor in the tank means that the Flexigester is too full and could indicate a blockage in the output pipe.

8.6 Observe the bubbles in the Gas Pressure Regulator. You will see over time a normal pattern of gas bubbling, and any significant changes to this will be an early indication of improvements or problems.

Troubleshooting Flexigester

1.0 No biogas being produced

1.1 The Flexigester, Biogas pipes or Biogas Storage Bag has been damaged.

Look round the Flexigester, Biogas pipes and Biogas Receiver Bag for any visible holes or splits. Holes and splits in the butyl rubber can be repaired using the repair kit provided.

1.2 Biogas pipes not fully pushed into the connectors.

Push all biogas pipes firmly into their connectors. Check that all clamps connecting biogas pipes to connectors are tight.

1.3 To check for leaks

Make a solution of soapy water using washing up liquid or similar. Coat all biogas pipe connections with the soapy water using a brush, squeezy bottle, hand spray or by pouring on. Look to see if bubbles form. If they do there is a leak. Push the biogas pipe into connector or tighten clamp. Adheseal can be applied if leak continues.

2.0 Material in Flexigester is too acid

Collect a cupful of biofertiliser from the Overflow Tank. Add one teaspoonful of bicarbonate of soda. If it fizzes the Flexigester is too acid and needs wood ash adding to it. Add a shovel of wood ash each day and check to biofertiliser as above until there is no fizzing.

3.0 The Biogas tail pipe is blocked

Squeeze the Biogas tail pipe to see if it contain gas or liquid. If it contains liquid hold the tail pipe up and squeeze to push the liquid back into the Flexigester.

4.0 Water in the biogas pipe line

Lift up the section of pipe with water in it and allow it to drain into the Biogas Pressure Regulator or back into the Flexigester.

5.0 Temperature too cold

If the temperature in the Flexigester falls below 20oC gas production will slow down and may stop. It will restart when the temperature warms up.

6.0	Liquid overflowing into the Discharge Tank
	Biofertiliser is coming out of the Outflow pipe into Discharge tank/soak away/Pasteu Panel
	This is normal. Biofertiliser will leave the Flexigester when waste is going into it or when the pressure inside the Flexigester is high
6.1	Biofertiliser is coming out of the Output Tube into the overflow tank Check the level of material in the Flexigester.
	If the level is high and to the top of the digester check the liquid level in the Biogas Pressure Regulator and increase the depth of water in the regulator. See “Refilling the Biogas Pressure Regulator” for details of how to check and refill.
	Check to see if material is coming out of the outflow pipe. If not go to section 7.2 below
7.0	No material is coming out of the outflow pipe of the Flexigester
7.1	The level of material in the Flexigester is below the level of the output pipe.
	The Flexigester is not yet fully filled and will begin to release biofertiliser when it is full
	If the Flexigester is fully working check that there are no blockages in the Biogas tail pipe or Biogas pipe. Remove and blockages. If pipe are clear reduce the liquid level in the Gas Pressure Regulator.
7.2	The output end is blocked
	Remove the cap from the top of the Y-pipe at the output end. Gently poke down the output pipe with a long stick to dislodge any blockages.
8.0	Input Tube overflowing
8.1	The Input Tube is blocked
	Remove the cap from the top of the Y-pipe at the input end. Gently poke down the input pipe with a long stick to dislodge any blockages.
8.2	The Input Tube is set too low
	Make sure that the top of the Input Tube is above the level of material in the Flexigester. If not lift up the Input Tube and secure it higher than the Flexigester.
9.0	Liquid leaking from tubes
9.1	There is a hole or split in the butyl tube
9.2	Apply a patch to the hole or split - See “Repairing the Butyl rubber”.

10.0 Repairing the Butyl rubber

Clean the area around the hole to remove all dust and debris and if possible dry the area. Cut a patch of Butyl rubber supplied in the repair kit larger than the hole. Apply Adheseal (supplied in the repair kit) to the patch and press it firmly over the hole or split. Ensure that the Adheseal forms an air-tight/liquid-tight seal. Additional Adheseal can be applied round the edge of the patch.

11.0 Problems or concerns

11.1 You may have problems or concerns which are not dealt with in this section. When this happens we would like you to contact us. We expect problems and we are here to help with overcoming them. The best way to contact us is with an email, together with photos of the issue. Whatsapp is another good way to get in touch. Our contact details are below - please get in touch.

Contact information

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