

# SIKCO Portable Floating Dome

## Biogas System (BioS)

**SIKCO** is manufacturer of fix dome biogas plant and strategic partner of SINTEX for all India promoting floating dome biogas products and accessories. **SIKCO** have wide range of biogas products (up to 1000 kg per day) suitable for everyone's need.

### About Feed Stock:

Only 10 Kg of solid feedstock (Cattle dung, Poultry waste, Kitchen waste, food waste, fruit waste etc.) with required bacteria culture (Cow dung) shall produces about 400g LPG equivalent methane (01 hour cooking) per day, and the reaction is completed within 20-25 days in anaerobic condition and continuous regular feeding provide daily output throughout year.

It shall be an extremely user-friendly system, because it requires daily only a couple of kg feedstock, and the disposal of daily just equal liters of effluent slurry.

Methane burns with a blue flame, without producing any smoke or soot. It is therefore an environmental friendly cooking system. In rural India, women generally burn traditional fuel such as agro waste, woody biomass and cattle dung in their cook stoves. These fuels produce pollutants in the form of smoke, soot and carbon monoxide.

Farmers always have rain damaged or insect damaged grain, spoilt fruits, and rhizomes and tubers etc. that can be used as feedstock in this biogas system.

Vegetable wastage also good feedstock for this plant. Cowdung is a good culture for starting a biogas plant initially.

### Calculations of Waste to Biogas:

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**SIKCO biogas plants are available from 01 kg to 120 Kg solid waste (50:50 =solid waste:water) per day capacity. For higher capacity multiple plants are suggested to be in series or in parallel.**

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2 Cattle / 16 human excrements / 10 kg food waste gives 1 Cu. Meter Biogas = 600 ml Kerosene = 3.5 kg fire wood = 1.5 kg charcoal = 400 gms of LPG = 4.7 Units of Electricity.

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## FIX DOME PORTABLE BIOGAS PLANT (Bios)

The Biogas Plant consists of following parts and accessories –

### Construction:

1. Digester
2. Inbuilt Gas Holder
3. Inlet Points
4. Cleaning Manhole
5. Drain Point
6. PVC Piping (Optional)
7. Biogas stove (Optional)

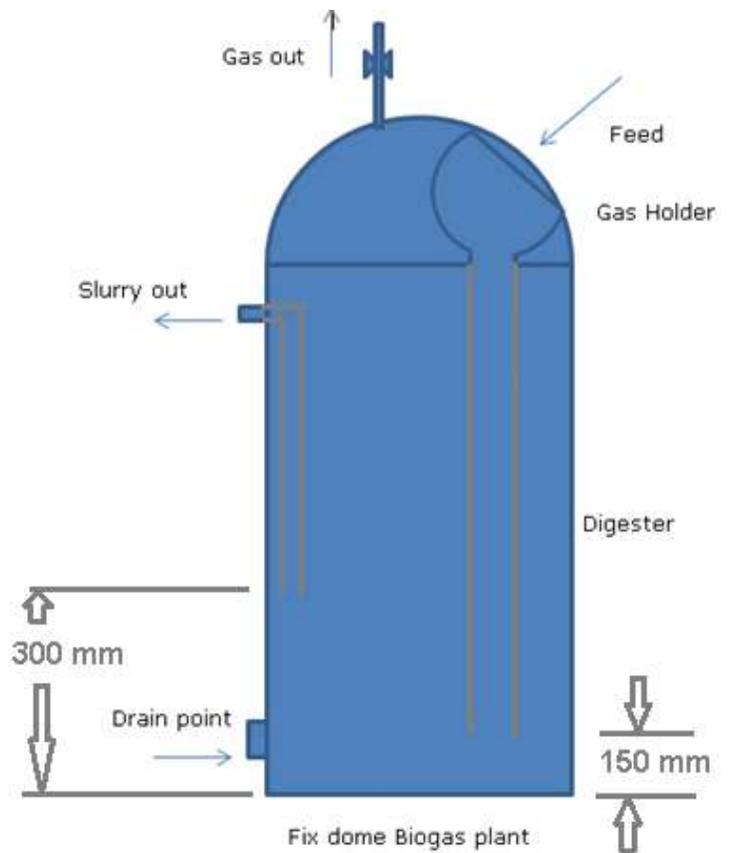


SIKCO BIO1001

### Mechanical parts



SIKCO BIO1001



## FLOATING DOME PORTABLE BIOGAS PLANT

The Biogas Plant consists of following parts and accessories –

### Construction:

1. HDPE Digester
2. Inbuilt HDPE Gas Holder
3. Inlet Points
4. Gas outlet
5. Spring spider supports
6. HDPE/ PVC Piping
7. Biogas Stove



SIKCO BIO1005



SIKCO BIO1004

SIKCO BIO1007

### Biogas plant (Bios)

Floating dome BIOGAS plant (Bios) is designed for handling and processing the biodegradable waste materials generated in kitchens in a decentralized manner. These plants serve following purposes.

1. Environment friendly disposal of biodegradable waste, which is need of hour considering mass pollution everywhere.
2. Generation of fairly good amount of fuel gas, which will definitely support the dwindling energy resources.
3. Generation of high quality manure, which would be weed-less and an excellent soil conditioner. This is very important for replenishing fast decreasing resources of productive soils.
4. It would reduce the menace of street dogs and other nuisance animals and pathogens, as major portion of biodegradable waste on dumping yards would no more be available for their feeding.
5. Reduction of man hour to waste disposal cycle
6. Environmental protection by helping in maintenance of elemental cycles in the nature

### **Bio wastes that can and cannot be processed in SIKCO BIOGAS plants**

The biodegradable waste that can be processed in the BIOGAS plant includes:

- Stale and unused portion of cooked food from households, hotels and industrial canteens
- Vegetable refuses either from vegetable markets or kitchens
- Shredded paper
- Abattoir waste especially the cattle intestinal materials
- Gobar, night soil
- Leaves, algae or plant materials recovered from water bodies like lakes, rivers or wells

Certain materials are to be strictly avoided. They include -

- Coconut and egg shells

- Coconut coir
- Feathers, hair
- Green twigs, wood
- Lemon or citrus material
- Large hard bones

The straw and sugarcane bagasse can be processed but only if effective grinding is available. These materials will have to be chopped very finely before processing.

SIKCO provide best of quality SS crusher / Pulpuriser as required by end user.

Design of BIOGAS plants may be classified under following two categories depending on segregation of waste received and its quality:-

#### **SEGREGATED AND CONTROLLED**

Under this category the material delivered would contain more than 85-90% of the bio-degradable material and remaining 15-10% waste would be manually segregated. Among the bio-degradable material, more than 80% of material would either be cooked waste or the green leafy vegetables which would require no extensive chopping or disintegration. The plants built for this category of material would employ nominal manual segregation and a simple low duty mixer to prepare the slurry. Probable sources for this type of MSW are hotels, vegetable markets and directly collected segregated waste from the residences in the vicinity. **It is suggested that 500 gms cow dung shall be fed for the first 14-21 days into the plant which use veg or food waste.** This will work as plant culture.

#### **SEGREGATED BUT UNCONTROLLED**

Under this category the material delivered would contain more than 85-90% of the bio-degradable material and remaining 15-10% waste would be manually segregated. The bio-

degradable material would not be controlled and may have all types of material like fruits, hard vegetables like jackfruit, white gourd, sugar cane remains etc. The plants built for this category of material would employ nominal manual segregation, but would employ elaborate chopping and disintegration equipment in addition to mixer to prepare the slurry. Probable sources for this type of MSW are vegetable markets, food processing industry wastes etc.

The three steps of Biogas production are as follows; 1) Hydrolysis 2) Acidification and 3) Methanogenesis. Various bacteria are involved in these processes.

### **Hydrolysis**

In the first step (hydrolysis), the organic matter is enzymolyzed externally by extra cellular enzymes (cellulase, amylase, protease and lipase) of microorganisms in the pre-digester tank. Converting solid waste into liquid form in the mixer stimulates this step. Bacteria start decomposing the long chains of the complex carbohydrates, proteins and lipids into shorter parts. Proteins are split into peptides and amino acids. Simple carbohydrates and proteins are degraded completely.

### **Acidification**

Acid-producing bacteria involved in the second step convert the intermediates of fermenting bacteria into acetic acid ( $\text{CH}_3\text{COOH}$ ), hydrogen ( $\text{H}_2$ ) and carbon dioxide ( $\text{CO}_2$ ) in the pre-digester. These bacteria, of the genus bacillus, are aerobic and facultatively anaerobic, and can grow under acidic conditions.

To produce acetic acid, the bacteria use the oxygen dissolved in the solution or bonded oxygen. Hereby, the acid-producing bacteria reduce the compounds with a low molecular weight into alcohols, organic acids, amino acids, carbon dioxide, hydrogen sulphide and traces of methane. The pH of the raw slurry falls from 7.5 to about 4.5 to 5.5 in the pre-

digester. It appears that in the pre-digester, various zones are formed and different bacteria dominate these zones.

Addition of hot water helps in eliminating the mesophilic bacteria and selection of thermophilic bacteria. But these thermophilic bacteria can operate at lower temperatures also. Hence hot water added even once a day should be sufficient for maintaining the pure consortium. However if it is possible to maintain the temperature in the range of 50-55oC throughout the day, the performance will definitely be better and the holding time may be further reduced. The hot water helps in hygienization of the slurry by killing the enteric bacteria that may be present in the waste. Some Gram negative Enterobacteria and Coliform bacteria have been isolated in the raw slurry. However in the second zone these bacteria are totally eliminated. From the pre-digester tank, the slurry enters the main tank where it undergoes anaerobic degradation by a consortium of archaebactereacea belonging to Methanococcus group. These bacteria are naturally present in the alimentary canal of ruminant animals (cattle). They produce methane from the cellulosic materials in the slurry. The undigested lignocellulosic and hemicellulosic materials are then passed on to the settling tank.

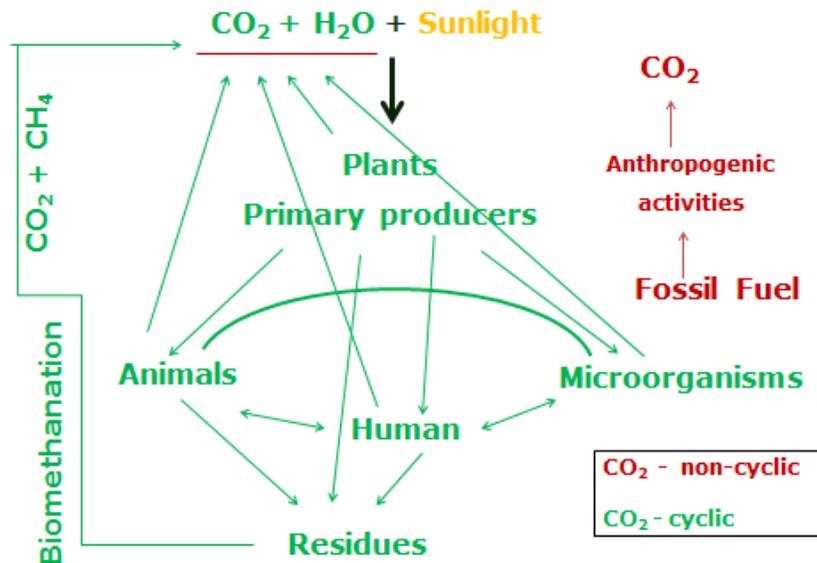
After about a month, high quality manure will be out from the settling tanks. There is no odour in the manure and the organic content is high, which can improve the quality of humus in soil. Manure preparation pit can be made if space is available.

### **Methane formation**

Methane-producing bacteria, involved in the third step, decompose compounds with a low molecular weight. Under natural conditions, methane-producing microorganisms occur to the extent that anaerobic conditions are provided, for instance under water (in marine sediments), in ruminant stomachs and in marshes. They are anaerobic and very sensitive to environmental changes. In contrast to acidogenic and acetogenic bacteria, methanogenic

bacteria belong to the archaeobacteria group, a group of bacteria with a very heterogeneous morphology and a number of common biochemical and molecular-biological properties that distinguish them from all other bacterial genera. It is advisable to circulate the generated biogas back into the system using a small compressor. This would enhance the reduction of Carbon dioxide to methane and enrichment of methane fraction in the biogas.

The separation of two stages in methane production helps in improving the purity of methane gas, thereby increasing its fuel efficiency. However, the average composition round the year would depend on how effectively pre-digester temperatures can be maintained. It is taken through a GI pipeline to utility points. Drains for condensed water vapor are provided online. The biogas burns with a blue flame and is ideal for cooking. Alternately, it can be used to produce electricity in a dual fuel biogas-diesel engine.



**Biogas helps in maintenance of elemental carbon**

## Frequently Asked Questions

### 1. What is Bio Gas?

Bio Gas is the gas generated as a result of fermentation of biodegradable waste like kitchen waste, animal waste, human waste and other organic waste like agriculture waste, garden waste etc.

### 2. What is the use of Bio Gas?

Bio Gas is normally used for cooking, lighting, heating or running generators to produce electricity.

### 3. What is the advantage of Bio Gas?

Bio Gas is the cheapest and cleanliest option as a fuel for cooking, lighting, heating etc. It is very clean gas and generate no smoke hence completely environment friendly. It is not only an eco friendly alternative source of energy, but also a means to produce organic manure for enriching our soil.

### 4. Why Biogas plants are required ?

India has a large population of livestock. At present there are nearly 20 crore cows and buffaloes. This figure is expected to reach 25 crore in the near future. Biogas from cow dung is proven application and technology.

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### 5. Is it economical to produce energy?

Yes, Bio Gas plant is the most economical way to produce gas for domestic use and manure to enhance the fertility of soil. Compared to operation and maintenance cost of other options of energy, it is the cheapest option for fuel, which also addresses the burning problem of organic wet waste.

### 6. How much area is required for Bio Gas plant?

Total area required is given below :

Sr. No.	Code No.	Size (Cum)	Area		
			Length Mtr	Width Mtr.	Area (Sq.Mtr)
1	FTGB 20-01	0.2	1	1	1
2	FTGB 50-01	0.5	1.7	1.7	2.89
3	FTGB 100-01	1	1.7	1.7	2.89
4	FTGB 200-01	2	2.1	2.1	4.41
5	FTGB 300-01	3	2.5	2.5	6.25
6	FTGB 400-01	4	2.8	2.8	7.84
7	FTGB 1000-01	10	4.5	4.5	20.25

We recommend little space to be left around the plant for easy movement of person for feeding and cleaning.

**Note :** Gas burning is purely an estimate and it largely depends on the type of feed stock that we use on daily basis ( i.e in morning and evening ) feed stock needs to be slurry type and mixed well with water before feeding in plant.

**7. What is the operating cost of Bio Gas plant?**

The operating cost of Bio Gas plant is very less. All what required for Bio Gas plant is 25 Kg. of cow dung slurry for 1 Cu. Mtr. of Bio Gas plant or say 5 to 6 Kg. of kitchen waste / on dry weight basis.

**8. Does it create bad odour?**

No it does not generate bad odour.

**9. How to install Bio Gas plant?**

Sintex Bio Gas plant is easy to install and does not require civil work. Please refer to Installation Instruction Manual for successful Installation of Bio Gas plant.

**10. How much time does it take to generate Bio Gas after installation?**

It takes around 30-35 days to produce Bio Gas from plant efficiently. In small amount gas generation starts after 20-23 days.

**11. Can we relocate Bio Gas plant after installation?**

Yes, Sintex Bio Gas plant can be relocated and reinstalled at different location without any damage or further expenses.

**12. What about slurry generated from Bio Gas plant?**

Slurry generated from Bio Gas plant is rich manure for the plants and agriculture. It can be used as a rich manure after drying it in open area.

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**13. Can we use Bio Gas frequently?**

Yes, we can use Bio Gas frequently about three times a day with an interval of around 4 hours.

**14. How long does Bio Gas run continuously?**

1 Cu. Mtr. Bio Gas runs approximately 1 Hour and 30 minutes at a time.

**15. Does it require specific burner?**

Yes, it requires special burner to cook food with Bio Gas.

**16. Does it work in winter season?**

Yes, it also works in winter season; only efficiency decreases around 20%. Bio Gas plant is recommended to be kept in sun light area to ensure the inside temperature doesn't get too low which affects efficiency of gas production.

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**17. Why Sintex Bio Gas plant?**

**Sintex Bio Gas plant is**

- Ready to use and easy to install
- No leakage
- Requires very less maintenance
- It is cleaner than conventional system
- Easy to relocate, if required
- It maintains inside temperature even in winter for more efficient gas production

**18. What is the break even period for Sintex Bio Gas plant?**

Break even period is approximately 3 to 4 years if gas is used for cooking application. (1 cum capacity plant)

**19. What is the process of gas generation?**

Gas generation is basically a bio methanation process.

**20. Does it consume energy?**

No it doesn't require any energy.

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### **21. What kind of Bio Mass can be used as feed stock ?**

It can use Bio Mass like animal dung, kitchen waste, human waste, fruit peelings, rotten fruits, oil cake, left over from oil processing, garden waste, agriculture waste, leaves of fruits, vegetable pieces, cakes of non-edible oilseeds, waste grain, seed of any plant species as well as non-marketable or non-edible seeds (wild species of ficus, mango and banana), rhizomes of bananas, canna, nutgrass, left over food, flour collected from the floor of a flour mill, spoilt milk can also be used as feedstock.

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### **22. How much cow dung / kitchen waste is required to feed on daily basis?**

Kitchen waste is high calorie feedstock which contains starch, sugar, cellulose or protein. This material is capable of producing more quantity of methane per ton of feedstock (on dry weight basis). Care must be taken to ensure that kitchen waste like vegetable pieces, leaves, wheat roti / bread or solid left overs are converted in semi liquid form before feeding in the plant. This can be done either by using food crusher or keeping kitchen waste in bucket with water for 4 to 5 hours prior to feeding.

**23. How much gas it can generate on daily basis?**

One can cook three meals per day by using 1 CUM Bio Gas plant.

**24. How about safety ?**

Bio Gas is lighter than air so any gas leakage will rise upwards unlike LPG. Bio Gas also has a higher temperature of ignition than other conventional source of energy.

**25. Can I get the electricity from it?**

Yes, Sintex Bio Gas plant can be connected with special type of Bio Gas ( Dual Mode ) operated engine which will convert Bio Gas into electricity.

**26. What are the benefits of Bio Gas manure?**

- Bio Gas manure nourishes the soil with supply of essential nutrients
- It doesn't have bad smell
- Insects do not grow in it
- Water holding capacity of the soil increases which helps growth in plants
- It enhances the aeration of soil for root penetration resulting in better growth
- Bio Gas manure doesn't have any side effect
- Cost effective compared to other chemical fertilizers
- It can be used in Kitchen Gardens, Terrace Gardens, Horticulture

## Technical Data Regarding Use of Biogas

(A)		
Sr. No.	Particulars	Gas Consumption
1.	Single Burner Chulha	0.23 M3/hr
2.	Double Burner Chulha	0.46 M3/hr
3.	Biogas Lamp	1.14 M3/hr
4.	For Engine	0.42 M3/hr/Horse Power
5.	For Cooking	0.28 M3/hr/day

Sr. No.	Code No	Size (cum)	Approximate feed stock Required per day			Daily running of gas stove
			Cow dung (Kg)	Mix Kitchen Waste		
				Minimum	Maximum	
1	FTGB 20-01	0.2	2.5-3.5Kg.+2.5-3.5 ltr water	0.5 Kg + 0.75 Ltrs	1 Kg.+ 1.5 Ltrs Water	50 Minutes
2	FTGB 50-01	0.5	5 -6 Kg.+ 5 Ltr water	1 Kg + 1.5 Ltrs	2 Kg.+ 3 Ltrs Water	1 Hour
3	FTGB 100-01	1	10-15Kg+10-15Ltr water	5 Kg + 7.5 Ltrs	7.5 Kg.+ 11 Ltrs Water	1 Hour & 30 Min
4	FTGB 200-01	2	25-40 Kg.+25 to 40 ltr water	15 Kg + 22.5 Ltrs	20 Kg.+ 30 Ltrs Water	2-3 Hour
5	FTGB 300-01	3	40-55Kg.+40Ltr water	25 Kg + 37.5 Ltrs	30 Kg.+ 45 Ltrs Water	4 Hour
6	FTGB 400-01	4	60-80 Kg.+80 Ltr	40 Kg + 60 Ltrs	50 Kg.+ 75 Ltrs Water	6 Hour
7	FTGB 1000-01	10	175-200 Kgs. + 200 ltr.	100 kg + 125 ltrs	125 kg + 155 ltrs water	12 Hour

**(B)**

**By using 1 M3 Biogas we can:**

- Cook for a family of 3-4, twice a day.
- Burn a 100 Candle Power Biogas lamp for 4 hrs.
- Run an engine of One Horse Power for 2 hrs.
- Save 600 gram coal, 400 ml petrol or 300 ml diesel.

**(C)**

Sr. No.	Particulars	Qty.(Approx.)	Gas Produced from 1 kg
1.	Animal Dung	10 Kg/day/animal	0.04 M3
2.	Human Excreta	0.4 Kg/day/human	0.10 M3

It is estimated by the Govt. of India, Ministry of Energy, that alternative sources of energy like bio-gas plants, wind mills etc. may reduce the dependence on conventional sources of energy by about 20% by the turn of the century, provided promotional efforts are continued. Presently, the cooking media in rural areas consist of burning dung cake, fire-wood and to some extent kerosene where it is available easily. The installation of bio-gas plants would directly replace the use of above three and in saving them, following gains would be made:

The benefits derived from bio-gas plants in terms of manure and useful energy are illustrated in Annexure 1 & II. The average NPK content of Farm Yard Manure (FYM) is about 0.5, 0.2 and 0.5 percent respectively and it may be observed that biogas slurry is rich in NPK by more than four times than ordinary dung when converted into FYM. When the country is faced with shortage of fertilizers and has to spend enormous amounts for its import, the application of bio-gas slurry can replace the chemical fertilizers to a large extent. Bio-gas slurry or FYM not only adds NPK but it proves the soil porosity and texture. These are established benefits.

### Packing List

No.	Items	Quantity
1.	'Sintex' made Biogas Digester	1 No.
2.	'Sintex' made Biogas Holder	1 No.
3.	Feed Inlet Assembly	1 No.
4.	Slurry Outlet Assembly	1 No.
5.	Single Stove Burner	1 No.
6.	Gas Outlet Pipe	10 Mtr.
7.	Outlet Ball Valve	1 No.
8.	Steel Support Frame	1 Set
9.	MS support	1 Set

- (i) Second major benefit is that rural people would gradually stop felling trees. Tree felling has been identified as one of the major causes of soil erosion and worsening flood situation. Government has started massive afforestation programme to tackle the erosion and flood situation. Continued deforestation has been causing ecological imbalances in the environment in which we live. Bio-gas plants would be helpful in correcting this situation.
  - (ii) In rural areas, kerosene is used for lighting lantern and cooking in a limited way wherever kerosene supply has been made possible. Whatever quantity is used can be replaced by bio-gas as it can be used for lighting and cooking. This would reduce the dependence on fossil oil directly and in saving foreign exchange.
  - (iii) Lastly, the most important social benefit would be that the dung being digested in the digester, there would be no open heaps of dung to attract flies, insects and infections. The slurry from digesters can be transported to the farm for application in the soil, thus keeping the environment clean for inhabitation. Also, gas cooking would remove all the health hazards of dung cake or fire wood cooking and would keep the woman folk free from respiratory and eye diseases which are prevalent in the villages.
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SIKCO BIO1006

@ Tata Power, Bhira, MH

## Location & Size Selection

The following points should be kept in mind for selecting the site for installing Sintex Floating Type Biogas Plant

- The surface should be even
- The site where the plant is to be installed should be as near as possible from the point of gas utilization
- It should be at proper open place where sunlight is available for maximum time
- Select the size according to your waste generation, availability of area and use
- Keep the outlet of slurry as per your convenience to collect and handle the digested slurry for manure
- Provide some container/chamber to collect and use the slurry from outlet
- 1.5 Cum & 2 Cum plant should be installed under 3 to 4 feet underground

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## Installation Procedure

### Charging of Biogas Plant

- Charge Biogas with fresh cow dung for the process initiation only
  - Cow dung shall be mixed with water in the ratio of 1:1
  - It must be filled up to the marked line on the tank or ensure that the opening between digester and slurry tank remains under the slurry (cow dung)
  - If digested slurry available nearby it is recommended to use that for charging which will make the process faster
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### **Biogas Generation**

- Provide the gas valve and delivery pipe for the end use of gas
- Keep the valve in close condition to make the generation process fast initially
- Keep monitoring the slurry tank initially to check the gas generation
- It takes around 25-30 days to generate biogas, depends on the weather
- Summer is the best time to initiate the process as the temperature remains around 35 – 40 Degree C, which is ideal for biogas generation

## **Maintenance of Floating Type Biogas Plant**

Sintex floating type biogas plant is simple to operate and handle as far as the beneficiaries are concerned. The following simple guidelines for general care and maintenance will increase the operational life and working efficiency of the Biogas plant several folds.

The daily, weekly, monthly, yearly and five yearly care and maintenance should be done as per the schedule given below :

### **Daily**

- Please use Biogas regularly on daily basis
- Use proper slurry mixture
- Use clean feedstock, free from soil, straw etc.
- Feed Biogas plant with recommended quantity of Bio Mass

### **Weekly**

- Clean gas burners and other appliances
- Remove the gas pipe line from the burner to drain off moisture condensed in the pipeline

### Monthly

- Check the ball valve, gas outlet pipe and gas pipe fittings for leakage

### Yearly

- Check for gas and water leaks from pipe and appliances
- Repair the worn-out accessories
- Replace damaged or non-working accessories

### Five yearly

- Empty plant and clean sludge & organic material from the bottom of the plant
  - Give a through check to the entire gas distribution system for possible leakage
  - Repaint the walls of the digester and gas holder tank with black enamel paint
  - Recharge the plant with fresh slurry
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### Do's

- Select the size of the biogas plant depending on the quantity of dung available with the beneficiaries.
- Install the biogas plant at a place near the kitchen as well as the cattle shed as far as possible.
- Ensure that the plant is installed in an open space and gets plenty of sunlight for the whole day, all round the year.
- Feed the biogas plant with cattle dung and water mixture in the right proportion. Add 1 part of cattle dung to 1 part of water by weight to make a homogeneous mixture.
- Ensure that the slurry (mixture of dung and water) is free from soil, straw etc.
- For efficient cooking, use good quality and approved burners and gas lamps.
- Open the gas regulator cock only at the time of its actual use
- Adjust the flame by turning the air regulator till a blue flame is obtained, this will give maximum heat.
- Light the match first before opening the gas cock.

## Do's and Don'ts

### Don'ts

- Do not install a bigger size of biogas plant if you don't have sufficient cattle dung or any other feed-stock to be used for gas production.
- Do not install the gas plant at a long distance from the point of gas utilization to save the cost of pipeline.
- Do not install the plant under a tree, inside the house or under shade.
- Do not compact soil loosely around the plant. It may get damaged.
- Do not add more than the required quantity of either dung or water, doing so might affect the efficient production of gas.
- Do not allow soil or sand particles to enter into the digester.

## Comparison of Floating Type Biogas System

Sr. No.	Parameter	Sintex Floating Type Biogas Plants	Traditional Biogas Plants
1	Material of Construction	Polyethylene	Bricks, Concrete, Steel
2	Space Required	Very Less	More
3	Gas Pressure	Constant	Variable
4	Effect of Temperature	Very Less	More
5	Maintenance	None	High
6	Amount of Feed	Very Less	More
7	Investment	Less	High
8	Pay Back Period	2 Years	3-4 years
9	Installation	Very Easy	Difficult
10	Portability	Yes	No

## Trouble Shooting

In rare event of malfunctioning in your biogas plant, please go through this trouble shooting chart before calling the Sintex Dealer/Customer Service Center.

Problem	Reason	Remedy
Stoppage of gas production	Acidification of the medium	Pour few buckets of water through the inlet pipe to dilute the medium. Then mix about one kg. of calcium hydroxide with about 10 liters of water and pour it through inlet pipe.
	Leakage in the system	Check all joints by applying soap water to them. If leak is detected between the gas holder and valve, seal the leak by applying an epoxy compound with hardener at the joint.
	Leakage in the rubber pipe	Change the pipe.
Very low flame	Accumulation of water in pipe	Disconnect the pipe from the gas burner and let it fall on the ground, so that the accumulated water flows out of it.
	Less gas production	In winter season, gas production decreases slightly. Add hot water into the feed in order to increase the efficiency of the plant.

### DO'S AND DON'TS

#### **DO'S**

- The safety rules should be followed strictly. Anyhow exposing to limited methane is safe.
- Always examine the plant for any abnormalities around the plant for eg., leakage of methane gas, over flow of the water outlet etc.
- The waste for high capacity plant i.e., more than 2 kg/day, should be received at plant in installments to prevent stagnation of waste.
- The aesthetics of the plant is very important. At no stage SIKCO plant should even appear as waste disposal plant.

- The gas holder should be painted periodically to prevent rusting.
- Charging plant for first 03 weeks with 500 gms gobar / cowdung as a culture or suitable culture till methane gas is come out

#### DON'T'S

- Never aerate the main digester (anaerobic digester). It would instantly kill the culture.
- Do not handle the processed waste without wearing gloves and face mask
- Never inhale Methane Gas to avoid health hazards.
- Do not use water from the manure pit for cleaning purposes. It contains residual amounts of methane.

SIKCO Pre-Fabricated Biogas Plant					Ex. Works Kharghar
SN	Model	Specifications	Max. Solid feed /day	Supply Cost (INR)	Transport & Installation Cost (INR)
<b>Portable Biogas Plant - SIKCO Fixed &amp; SINTEX Floating Dome</b>					
1	SIKCO BIO1001 (Indoor)	Fix dome, HDPE, Gas Stove	1	9900	1450
2	SIKCO BIO1002 (Indoor)	Fix dome, HDPE, Gas Stove	3	11900	3950
3	SINTEX BIO1004 (0.2m3) / FTGB 20-01	Floating dome, HDPE, Gas Stove	5	18900	7450
4	SINTEX BIO1005 (1m3) / FTGB 100-01	Floating dome, HDPE, Gas Stove	22	24900	12450
5	SINTEX BIO1006 (2m3) / FTGB 200-01	Floating dome, HDPE, Gas Stove	60	39900	19950
6	SINTEX BIO1007 (3m3) / FTGB 300-01	Floating dome, HDPE, Gas Stove	85	59990	29995
7	SINTEX BIO1008 (4m3) / FTGB 400-01	Floating dome, HDPE, Gas Stove	130	85990	42995
8	SINTEX BIO1009 (10m3) / FTGB 1000-01	Floating dome, HDPE, Gas Stove	325	225990	112995

#### Note :

1. Ex. Stock Kharghar price. GST Extra.

