

Information Booklet



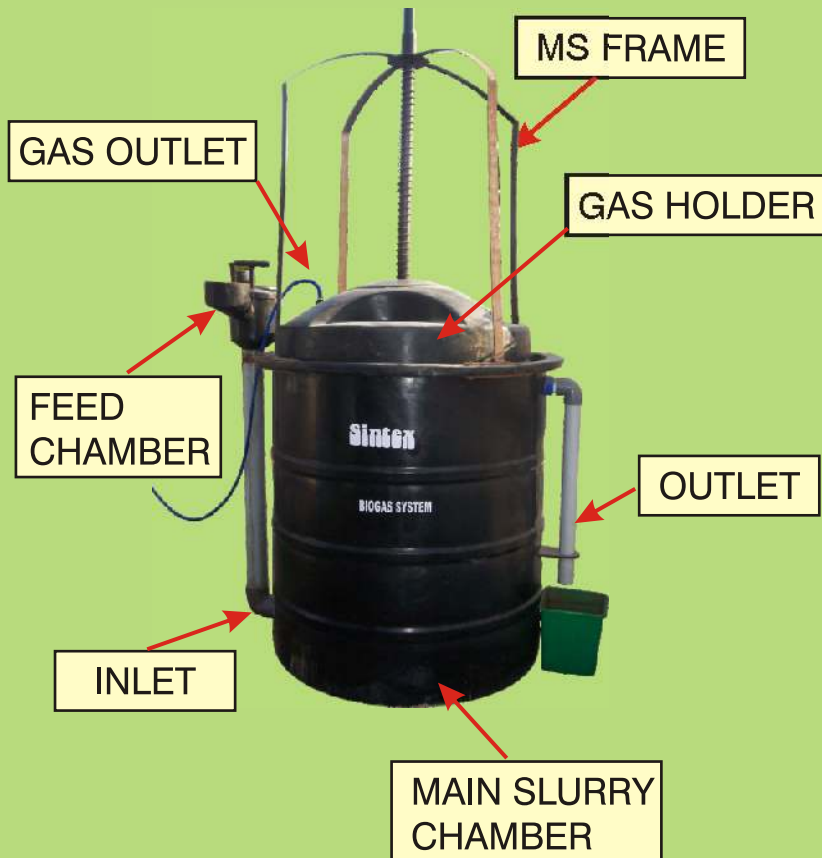
Sintex

floating type BIOGAS plants

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Components of Floating Type Biogas Plant



Sintex

floating type BIOGAS plants

Forward

In recent years, biogas systems have attracted considerable attention as a promising approach to decentralized rural development. Biogas is one of the sources of renewable energy. It forms naturally in humid environments with no air or oxygen and can be obtained artificially by fermenting animal or plant waste in a basin known as a biodigester or 'Biogas Plant'. Biogas plants do more than producing gas, their effluent can be used to fertile soiled based crops and therefore improve agricultural yield.

Developed and developing countries and several international organizations including UNESCO have shown an interest in biogas systems with respect to various objectives: a renewable source of energy for cooking fuel, conversion of manure into an improved fertilizer, waste recycling, rural development, public health and hygiene, pollution control, environmental management, appropriate technology and technical co-operation.

The manual developed by Sintex on the design and maintenance of family size biogas plants illustrates the importance of adapting biogas technology to ensure that it works in the local setting, and that its use can be sustained. Our plant has contributed locally towards the reduced use of firewood for cooking and other activities, leading to a reduction in greenhouse gas emissions. Vegetation as been under less pressure, especially in the target villages, as a result of the decreased use of firewood.

Message

Preface

We believe Sintex, a name synonymous with Water Tank needs no further introduction. We have been in the forefront of innovation, bringing not only products but total solution to various domestic and industrial applications for more than 30 years. We are also pioneers in the field of developing range of products for various applications of Solid Waste Management.

The pressure of rapid urbanization and increasing population has reduced India's forest to a few scrubby tree way out on the horizon causing extreme fuel shortage in the country. Acute shortage of fuel has not only increased the cost of traditional fuel sources, but also put terrible burden on middle class families across the country.

Sintex, for the first time in the world had taken this problem as an opportunity and has come out with portable ready-to-use Biogas Plants in the most successful 'Floating Type' designs.

Sintex Biogas Plants are the first portable and ready-to-use plants anywhere in the world; moulded in tough piece by state-of-the-art moulding process manufactured from grade of polyethylene material conforming to the requirement of IS 10146–1982; non toxic, free from any contamination, chemical resistant, blended with stabilizers, anti corrosive and anti acidic, absolutely smooth and sanitary, designed specially for semi urban and rural areas to produce gas from organic waste (Kitchen Waste/Garden Waste / Cow/ Buffalo Dung).

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 cleanest 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.

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	1.73	1.73	2.99
2.	FTGB 50-01	0.5	2.1	2.1	4.41
3.	FTGB 75-01	0.75	2.1	2.1	4.41
4.	FTGB 100-01	1	2.1	2.1	4.41
5.	FTGB 150-01	1.5	2.35	2.35	5.52*
6.	FTGB 200-01	2	2.5	2.5	6.25*

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

* To be installed underground

Frequently Asked Questions

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.

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.

Frequently Asked Questions

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.

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.

Frequently Asked Questions

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.

Different Sizes

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 to 3.5 Kg. + 2.5 to 3.5 Ltrs. water	0.5 Kg. + 0.5 Ltrs.	1 Kg. + 1 Ltrs. Water	50 Minutes
2	FTGB 50-01	0.5	5 to 6 Kg. + 5 Ltrs. water	1 Kg. + 1 Ltrs.	2 Kg. + 2 Ltrs. water	1 Hour
3	FTGB 75-01	0.75	8 Kg. + 8 Ltrs. water	1.5 Kg. + 1.5 Ltrs.	3 Kg. + 3 Ltrs. water	1 Hour & 20 Minutes
4	FTGB 100-01	1	10 to 12 Kg. + 10 Ltrs. water	2 Kg. + 2 Ltrs.	4 Kg. + 4 Ltrs. water	1 Hour & 30 Minutes
5	FTGB 150-01	1.5	15-17 Kg. + 15 Ltrs. water	3 Kg. + 3 Ltrs.	6 Kg. + 6 Ltrs. Water	1 Hour & 45 Minutes
6	FTGB 200-01	2	20 to 22 Kg. + 20 Ltrs. water	4 Kg. + 4 Ltrs.	8 Kg. + 8 Ltrs. water	2 Hours

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 (Duel Mode) operated engine which will convert Bio Gas into electricity.

Frequently Asked Questions

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

(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

Major Benefits of Installing Biogas Plant

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:

Please refer our manual & Do's & Don'ts for successful operation of Sintex Biogas Plant
The specifications and information given herein are in good faith but without warranty.

Major Benefits of Installing Biogas Plant

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.

- (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.

Packing List

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

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 underground

Area Required for Different Sizes

Sr. No.	Code No.	Size (Cum)	Area		
			Length Mtr.	Width Mtr.	Area (Sq. Mtr.)
1	FTGB 20-01	0.2	1.73	1.73	2.99
2	FTGB 50-01	0.5	2.1	2.1	4.41
3	FTGB 75-01	0.75	2.1	2.1	4.41
4	FTGB 100-01	1	2.1	2.1	4.41
5	FTGB 150-01	1.5	2.35	2.35	5.52
6	FTGB 200-01	2	2.5	2.5	6.25

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

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

Do's and Don'ts

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.

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.

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.

Comparison of Sintex 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

Referral Coupon (Customer's Copy)

CUSTOMER DETAILS :

CUSTOMER NAME :

ADDRESS :

TALUKA : DISTRICT :

STATE :PIN.....

CONTACT NO (M).....(R).....

EMAIL ID :

REFERRED TO :

NAME :

ADDRESS :

.....

CAPACITY INSTALLED :

Referral Coupon (Company's Copy)

CUSTOMER DETAILS :

CUSTOMER NAME :

ADDRESS :

TALUKA : DISTRICT :

STATE :PIN.....

CONTACT NO (M).....(R).....

EMAIL ID :

REFERRED TO :

NAME :

ADDRESS :

.....

CAPACITY INSTALLED :

SINTEX FLOATING TYPE BIOGAS PLANT

WARRANTY CARD No.:

Fill up the card with all the details and retain with you.

Customer Details :

Customer Name :

Address :

Taluka : District :

State : PIN.....

Contact No (M).....(R).....

Product Code:Size:.....

Invoice No.:Date:

Date of Installation:

Part Details in case of manufacturing defect:

Warranty Clause:

Warranty is given only for the manufacturing defect of the plant or part of the plant subject to following conditions.

- 1) Any sharp/ heavy impact load subject to the plant (All parts of the plant)
- 2) Improper weight/ load/ pointed load on the holder.
- 3) Plant must be kept on proper, clean & uniform surface as below:
 - (a) 0.2 to 1.0 M3 capacity plant over ground
 - (b) 1.0 to 2.0 M3 half or 70% under ground
- 4) Unanticipated hitting/ force on the digester or plastic body/ parts of the plant.

Dealer's Details & Signature:

(Signature of Client)

SINTEX INDUSTRIES LIMITED
PLASTICS DIVISION

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