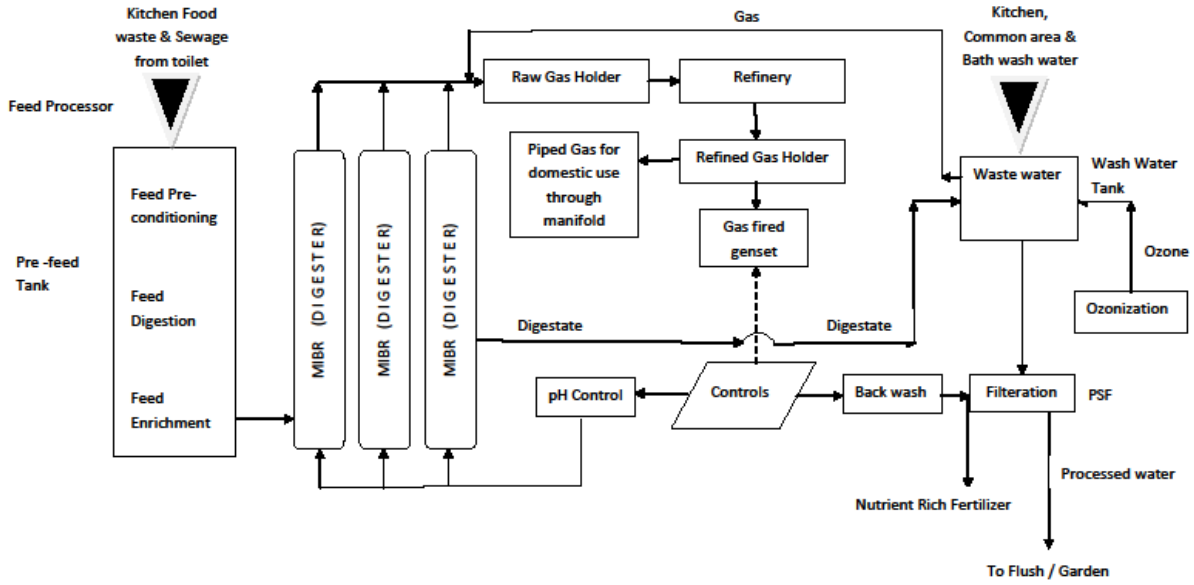
CO-DIGESTION PLANT FOR KITCHEN FOOD & SEWAGE WASTE

Technology

The plant uses a combination of the Bio-Methanisation process used in the Refined Bio-Gas plant as well as the conventional waste water treatment to process the solid organic waste as well as the waste wash water generated within the living spaces of a community. This technology is suitable for gated communities, hotels, etc without access to sewage treatment system or municipal sanitary connections. The technology is scalable and plant can be built to any size to handle all the solid waste & waste water generated within a community.

Process Flow Diagram

KITCHEN FOOD & SEWAGE WASTE CO-DIGESTION PLANT – PROCESS FLOW



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Process details

Toilet WC (Sewage water) from the rooms (houses, apartments, hotels, resorts) & staff toilets will be directly connected to the Pre-feed tank. Solid waste from every Kitchen after grinding to a paste in the feed processor will be directed to the same pre-feed tank. In the pre-feed tank pre-conditioning, digestion and feed enrichment occurs. The slurry is then pumped to MIBR (Bio-reactor) through proper connections, as shown in the flow diagram. Bio methanisation takes place in the bio reactor and the gas produced will be collected in the gas holder (crude gas).

The gas holder is made of a special combination of materials, poly amide coated with nylon fabric neoprene rubber and hyplon rubber. This to make sure that the product can withstand environmental condition including UV, attacks from pest and resistance to fire. The storage pressure of gas is less than atmospheric pressure, hence there are no safety problems and also does not require statutory approvals.

This (crude) gas will be further pumped through a de-moisturizer, de-sulphanator and refinery. The refinery removes the carbon dioxide content in the gas. The refined and purified gas has a purity, in the range of 85-98% methane depending on the type of refinery installed & purity desired. The refined gas will be stored in a refined gas holder. In this process the gas will be clean of all organic chemical substances like sulphur, carbon dioxide, phosphates, nitrates, ammonia and water. This (refined) gas can be used as pipe line grade natural gas (PNG) prescribed by the government for thermal applications also if required this gas can be filled in CNG cylinders and can be used for commercial thermal applications as well as automotive fuel.

The carbon dioxide separated in the refining process will not be let out to the atmosphere in this Plant. The carbon dioxide is re-used after converting to carbon monoxide and hydrogen in the carbon dioxide re-breather using a proprietary technology. This carbon monoxide will be taken back to the bio reactor which further enhances the anaerobic process and increase the gas production and methane content in the crude gas. In addition to this, the process makes sure that the sulphur content in the crude gas is less than 100 PPM by another proprietary in built technology.

However to reduce the sulphur content further a de-sulphonator is incorporated. This purified gas can be directly connected to any LPG stove and can be used just like the conventional LPG gas through a gas manifold.

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Depending upon the requirement of pressure at the user point, additional facility to maintain the line pressure with separate booster pumps can be provided. The gas received at the user point will be free from moisture content with required pressure.

The digestate from the outlet of the bio reactor will be taken to waste wash water holding tank. The bio reactor digestate, kitchen waste water and all other effluent from the complex will be connected directly to this tank. In this process further bio-methanisation of the bio degradable materials takes place and the gas produced so will be collected in the same crude gas holder.

The ozonisation of the waste water in the tank will be carried out using a ozonisation plant. The effluent from this tank after ozonisation will be filtered through a pressure sand filter to meet the effluent norms of State Pollution Control Board with respect to BOD, COD and particulate matter for disposal to land & sea.

The effluent can be further treated if required for process use & domestic consumption. The back wash process will generate nutrient rich fertilizer in slurry form which will be collected in a separate tank for storage and later use.

Technical Details:

The very high efficiency Bio-Methanization Waste Treatment Technology is a proprietary technology and has been the result of over 8 years of research and development. It has been designed to process any feedstock including food waste, kitchen waste, municipal solid waste, oil effluents, agricultural crops such as corn, slaughter waste, poultry waste, fish waste, animal dung, night soil, weeds such as water hyacinth, water lettuce etc. Based on the principles of multi-stage anaerobic digestion, it allows high yield gasification with high purity. The standardized configuration of the Technology allows quick and trouble-free construction and commissioning of the gas plant.

The advantages of Bio-methanziation Waste Treatment Technology are:

- A totally indigenous technology developed with over 8 years of research by the thought leaders in this space

- This technology produces 50-60% more gas compared to conventional technologies due to multi stage digestion, pure microbes and proprietary CO2 re-breather systems

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- The quality of the gas production is far superior compared to any other technology with methane content over 75% and H2S less than 100 ppm in the crude gas which can further enhanced to 98% purity

- The design of the plant is modular, fully automatic with SCADA control that supports high redundancy targeting near zero downtime.

- It is a zero discharge technology with no emissions (gas or solid) requiring no effluent management except liquid effluent which meets all Pollution Control specifications and norms.

- NPK rich fertilizer and high alkaloid pest repellent are the revenue generating by products from this technology.

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