

ECO facts

Eco-Tec's BgPur™ (Biogas Purification) Process Description and Control

The BgPur™ is designed to reduce sulfur dioxide emissions, equipment corrosion, and fouling by removing hydrogen sulfide (H₂S) from biogas. Eco-Tec's patented H₂S purification system offers cost savings, and greater energy recovery for use in multiple applications.

The following is a description of the process as shown in Figure 1.

Biogas Contactor (BGC) Vessel and System:

1. Biogas enters the unit boundary or it can be by-passed (not shown) to a storage/flare system provided by others.
2. Biogas and recycled biogas are fed to a blower, which operates at a flow rate at least 10% greater than the maximum actual flow rate, and at a pressure high enough to meet hydrostatic head and pressure losses, ensuring that no untreated gas can enter the discharge line.
3. In the BGC Vessel, biogas is intimately contacted with the proprietary absorption solution at a pH of about 7.9 to 8.1, which absorbs greater than 99% of the hydrogen sulfide and almost all carry-over particulates.

A pH meter is installed in the gas BGC Vessel, which shows when make-up chemicals should be added.

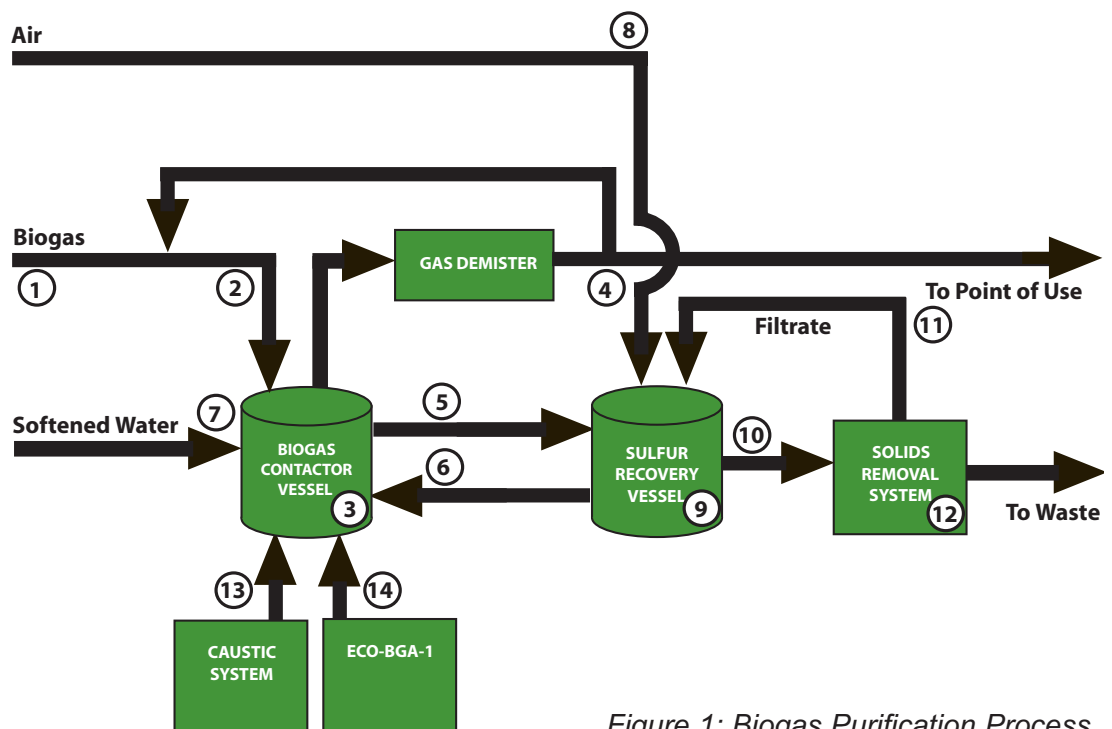


Figure 1: Biogas Purification Process



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4. Treated biogas exits this BGC Vessel through a mist eliminator. A portion is returned to the blower as recycle gas, the remainder being available for utilization at essentially the same pressure and flow rate as the supply gas. No pressure control system is required on the gas side with only a pressure gauge used to assist in trouble-shooting the performance of the contactor.

Absorption Solution Circuit

5. The H₂S rich absorbing solution discharges from the BGC Vessel over a weir and is fed to the bottom of the SRC Vessel through a 775 mm (30 in) water column gas seal.
6. The regenerated solution discharges from the bottom of the SRC Vessel and is pumped to the BGC Vessel for recontact with the biogas.
7. Make-up water is added into the BGC Vessel based on level control in a still well in the SRC Vessel, which is equipped with a level transmitter and controller.

Sulfur Recovery Contactor (SRC):

8. Air is added through a blower impeller-shroud system to regenerate the solution. By contacting the spent absorption solution with air, the solution is regenerated, and producing elemental sulfur.
9. The SRC, in addition to regenerating spent absorption solution, also acts as a floatation cell where the microcrystalline sulfur slurry froth floats over an adjustable discharge weir into a slurry chamber.

Sulfur Slurry Chamber:

10. Dilute sulfur slurry (about 5% solids) is discharged into the Sulfur Slurry Chamber, from which it is pumped to the solids removal system (typically a filter press). Slurry level is monitored in the Slurry Chamber and when it is within the desired level, pumps sulfur slurry to the solids removal system.
11. Filtrate solution from the solids removal system is returned back into the sulfur slurry tank where it is used to break up the sulfur slurry froth.

Solids Removal System:

12. The solids removal system is designed for either continuous sulfur removal or in the case of filter presses, to be typically opened every 24 hours.

Make-Up Chemicals:

13. Caustic Soda
14. Eco-BGA-1 chemical additive solution

The chemicals are fed into the standpipe of the BGC, using metering type drum pumps based on the pH in the BGC Vessel. Residual hydrogen sulfide measurements downstream from the unit are made periodically to evaluate system performance.

Note: The above is a general description that may change, depending on the application. A detailed Operating and Maintenance Manual will be provided on completion of an agreement to purchase an Eco-Tec unit.

Contact Eco-Tec for more details!

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