



BRAZILIAN FARMERS BENEFIT FROM ANAEROBIC BIODIGESTERS THAT PRODUCE BIOGAS AND BIOFERTILIZER



Energy shortages in rural Brazil are fairly common. As a solution, the Brazilian government supports the construction of anaerobic biodigesters as an alternative energy source. With proper construction and appropriate treatment of effluent, an anaerobic biodigester:

- provides efficient utilization of animal and human waste products;
- reduces the emission of greenhouse gases and increases odor control;
- produces a highly effective biofertilizer, which significantly increases rural productivity;
- produces biogas, a renewable energy source, that can be used in place of natural gas or liquefied petroleum.

In 2008, Firestone EPDM Geomembrane was used in eleven projects on eight properties as both the lining and digester cover material. The digesters ranged in size from 27 m long by 10 m wide (88.58' long x 32.81' wide) to 54 m long by 5 m wide

Quick Facts

PROJECT SCOPE:

- Produce alternative energy through use of anaerobic biodigesters
- Create biodigesters for hog farmers and a local agricultural school
- Develop 11 biodigesters to combat greenhouse gases and odor problems

CHALLENGES FACED:

- Seek sloped locations to utilize gravity to carry the waste to retention ponds
- Prevent waste seepage to groundwater supplies
- Create tight lids to prevent interference with methane production

SOLUTIONS:

- Excavate locations to depth of 4.5 m (14.76') and desired length and width
- Line with 15.25 m by 30.5 m (50' by 100') Firestone EPDM Geomembrane panels
- Create airtight seal using Firestone EPDM Geomembrane as biodigester cover



Brazil Biodigesters – Sao Paolo, Brazil

(177.17' long x 16.4' wide). All units were 3.5 m to 4 m (11.48' to 13.12') high from the floor to peak of the digester at maximum capacity.

After the digester beds were excavated, a concrete beam was poured around the perimeter. Once the concrete set, EPDM panels were placed into the basin with the edges placed over the concrete beam. Panels were seamed together using the Firestone QuickSeam™ Tape System.

Another panel was then laid out for the cover. To ensure a completely anaerobic environment and prevent the membrane from shifting, the cover was fastened to the lining layer and concrete with galvanized steel termination bar and anchor bolts. It was finished with water block seal.

"Firestone EPDM Geomembrane makes an ideal dome for these biodigesters because of its amazing elasticity characteristic," stated Luiz Prado, manager, Ecosys Biodigestores, Sao Paolo, referring to the membrane's ability to elongate over 300 percent. "Together, the EPDM lining

and digester cover provide a secure anaerobic environment, which is necessary to produce methane gas from the waste material. If exposed to oxygen, the decomposition of organic matter will produce only carbon dioxide," he continued.

The anaerobic biodigesters treat an average of 25 m³ to 36.5 m³ (882.87 ft³ to 1288.99 ft³) of animal waste per day, depending on dimensions of the units. The resulting biofertilizer can be sprayed on crops as an organic liquid fertilizer. There are also indications that biofertilizer may help reestablish the level of humus in the soil and restore a healthy pH balance.

"I am very delighted with the outcome," said Marcio Pereira, owner of one of the hog farms in Sao Paolo. "The Firestone EPDM material was easy to install and maintain. Because of the membrane's black color, it is ideal for attracting the sun's heat and maintaining the high temperatures required to produce high amounts of biogas, while being resistant to damage from UV exposure."



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