



## Muffin Monster protects pumps, enhances productivity in biogas application

### Problem:

Low production and high maintenance in biogas production facility due to problem solids, viscous nature of sludge and a solids content exceeding 8 percent dry solids (DS)

### Solution:

30004-B150 Muffin Monster

### Harnessing the power of biogas energy

Anaerobic digestion offers an efficient, cost-effective process for green energy development, while also providing a sustainable solution for the disposal of animal by-products. In a typical biogas processing operation, manure, wastewater solids, agricultural residues and food scraps are delivered to a digester system. The process uses microbes to break down the organic material through a fermentation process under controlled conditions, resulting in clean biogas and digested material. That digested material is then used to make fertilizer, compost, soil amendments or animal bedding. The raw biogas is further processed, and water, carbon dioxide and other trace compounds are removed, leaving mostly methane and other trace gases. The processed biogas is then distributed and used for producing electricity, heat, and fuel, or injected into natural gas pipelines. Biogas provide a clean, repeatable source for energy and fuel, while also making use of organic materials that might otherwise end up in a landfill.

Organic feedstock also comprises tough, large pieces of inorganic debris, like metals and plastics. This material, if left uninhibited, can clog the pumps and pipelines within the digester and cause the system to breakdown. Operators have to dismantle the pumps and build them back together, a time-consuming and costly process. In 2013, a biogas application facility in Catalonia, Spain was experiencing these very problems. They worked with Protech Continental, the exclusive JWC International distributor in Spain, to devise a long-term solution that would keep the system running smoothly.

The biogas facility relies on feedstock from local industrial (dewatered sludges) and agricultural (manure and slurry) sources to produce biogas, which they then use to generate electrical power. In the process, the dewatered sludges are fed into the system, along with the slurry and cow manure, typically with 8-12 percent dry solids (DS) — a typical feedstock combination in the Spanish biogas market. Dewatered sludges at 25 percent DS are mixed with quantities of manure at 5-8 percent DS, to give a resulting mixture of around 13 percent DS which can be pumped and still has a high organic content, rather than diluting or watering the thick sludge down.

The liquid manure is used to dilute the dewatered sludge to reduce the viscosity to around 3000-5000 cPs (3000-5000mPa-s), which is similar in viscosity to syrup or molasses. This ensures it is easily pumped and still able to sustain the process without diluting the organic content available for digestion.

The customer found that the imported loads included many inorganic problem solids, including metal pieces, plastics, tools and ropes which caused significant problems for the in-line chopper pump. Eventually the chopper pump was replaced with a progressive cavity pump supplied by Protech.

# CASE STUDY

## SPANISH BIOGAS FACILITY

The pump performed exceptionally well, sucking the slurry up and out of the mixing tank and into the process. However, the tough inorganic solids eventually caused undue wear and weekly maintenance issues, resulting in the first stator replacement after just six months of operation. Protech worked with the engineers on a more durable, reliable solution for the tough waste, and suggested an in-line Muffin Monster. The dual cutter stacks are equipped with exceptionally sharp, stainless-steel teeth, ideal for slicing through incredibly tough debris.

Since incorporating the Muffin Monster, the system hasn't experienced any downtime due to material clogging, and the maintenance crew was able to wait 19 months to replace the stator.

By installing the PC pump with the Muffin Monster for protection, the customer gained operational hours due to reduced maintenance, spare parts savings, and also reduced downtime and failures in the plant. The addition of the grinder is the only upgrade/addition to the facility since it was built and the grinder has extended the stator repair interval offering savings of approximately €500 (\$546.62 USD) per stator change, and has further increased the maintenance and repair intervals to keep the plant operating at peak performance.



Since its founding in 1973, JWC Environmental has become a world leader in solids reduction and removal for the wastewater industry with its Muffin Monster grinders and Monster Separation Systems for screening, compaction and washing. JWC also solves challenging size reduction and processing problems in commercial and industrial applications through its Monster Industrial division. JWC Environmental is headquartered in Santa Ana, California, and has a global network of representatives, distributors and regional service centers to provide customer support. For more information, visit JWC Environmental at [www.jwce.com](http://www.jwce.com).

