

Powering The Power Plants

By Tom Stone

Established in New Jersey's Chemical Corridor, Fuel:Bio Holdings looks to bring greener pastures to the Garden State in the form of biodiesel. With a business plan to market large quantities of this cleaner-burning fuel at more economical prices for power plants, the company has been operational since May 2007.

The company uses proprietary technology and processes to produce ASTM D6751-certified biodiesel in accordance with industry specifications, helping to ensure proper performance. Planted on 2.5 acres along the Jersey shore, the facility was designed by employees. Current annual plant capacity is 50 million gallons with an on-site storage capacity of roughly 1 million gallons.

Most of our customers are in the testing phase. Since this is a relatively new product for them, they are concerned about how to integrate it into their current system, states John Borruso, Fuel:Bio government affairs liaison. However, a test using biodiesel in a power plant can consume a tremendous amount of fuel. You're talking about one test using about a week's worth of production.

Even though Borruso can't go into specifics on how many plants are currently testing its biodiesel, he was able to elaborate on one already publicized test. Princeton University conducted a test with Fuel:Bio's biodiesel to see how its campus energy plant boilers and gas-turbine co-generation system would perform.

The test ran 100 percent biodiesel in the university's system. The numbers that came back have been great, adds Borruso. The reduction in emissions and the increase in efficiency have been marvelous. The idea behind this for Princeton is to reduce its emissions across the board. By using biodiesel in their generators, they can reach this goal.

Key to the success of any biodiesel production facility is the quality of finished product. Biodiesel can be produced by nearly anyone, but ASTM D6751-certified biodiesel is specified for tests being conducted by Fuel:Bio at various power plants throughout the market. To produce a product at this quality level, the correct equipment must be in place and performing as expected. An important element one critical to the company's biodiesel production success is pumping.

Early in the plant's design phase, Fuel:Bio knew implementing the proper pumping equipment would be crucial. The company went to its mechanical contractor, Mobil Welding, who contacted its local equipment distributor, ALEDco, for advice on the proper equipment for each application. Chris Manganiello of ALEDco consulted with Blackmer regional manager Todd MacGregor—the two knew Blackmer sliding vane and centrifugal pumps could be the right fit for many specific biodiesel applications. Now Fuel:Bio's facility currently houses seven System One® centrifugal and four NP Sliding vane pumps.

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The Blackmer pumps are ideal for biodiesel in several ways, notes T.P. Harnanan, Fuel:Bio plant manager. They are more durable and provide the reliable flow rates needed for our process. If you end up with an incorrect ingredient ratio, your formula will be messed up.

Fuel:Bio's facility uses System One® Frame LD17 and Frame S centrifugal pumps. Designed around the seal, where 90 percent of pump failures occur, these pumps offer a stiff shaft and large bearings to result in the widest operational window off the best efficiency point. The Frame S delivers capacities to 450 GPM (102 m³/hr), while the LD17 reaches capacities of 1,400 GPM (320 m³/hr) and features the stiffest shaft in the industry, reducing seal and shaft failures. The company also chose Blackmer's 2 and 3 NP sliding vane pumps, which grant biodiesel producers high volumetric efficiency and low slippage, thereby requiring less horsepower and energy.

Even though Fuel:Bio is happy with its current plant and production capabilities, the company looks to grow. We plan on eventually increasing our production capacity at this plant. We can easily do that by increasing the size of our Blackmer pumps, along with a few other minor adjustments, states Harnanan. Along with increased production, the company plans to bring more feedstocks into the fold for a higher return on investment and a better overall approach to biodiesel production with lower emissions. In essence, production would consist of a closed-loop system that grows feedstock from the emissions produced by the power plant.

"Algae is very exciting for us right now. We have identified six strands to focus on, explains Borruso. "We see a tremendous amount of potential to integrate the algae with the reduction of additional CO₂ from power generation. We can grow the algae at any location in vertical tubes that can be built as high as you deem fit, and the growing process can still be paired with the power plants in running those emissions through the algae, allowing it to feed off the CO₂ as it grows.

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