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 *Greene Team Pellet Fuel Company*

How Greene Team Pellet Fuel Uses In-line NIR Sensors to Improve Process Control, Quality Control and Safety

Strategically placed moisture sensors from Process Sensors optimize efficiency throughout the processing plant



In an era of environmental consciousness and recycling, there are many industries that have been born out of necessity or opportunity—taking an item that was once considered trash and transforming it into another item that has value. Pellet fuel, and in particular wood pellets for residential use, is one of those industries. By utilizing saw dust and wood chips—natural byproducts from the milling of lumber and wood products manufacturing—the wood pellet industry repurposes material that was once dumped into our landfills and transforms it into a high-efficiency fuel.

Trash to Treasure

One such company that has been able to turn trash into treasure is the Greene Team Pellet Fuel Company, located at the site of an abandoned coal mine in southwestern Pennsylvania. Established in 2006 with wood pellet production beginning in 2007, Greene Team currently produces over 35,000 tons of wood pellets a year.

Their automated facility converts saw dust and wood chips from area lumber mills into a finished wood pellet product. But it wasn't always automated and their production numbers weren't always that high, says



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Operations Manager Andy Galis. “We used to do all of the quality control and process control procedures by hand—every 20 minutes we would pull a sample post-dryer and put it on a moisture balance. We needed to be sure we were at the right moisture levels before the material went into the press. And every 40 minutes we would pull samples of the finished product, to ensure we were meeting our moisture targets there as well. If you’re running three shifts, that’s a lot of manual labor in a 24-hour period to keep up with that.”

QC and Process Automation

Early on, as Greene Team explored options for automating their operations, they felt the first place they needed to start was at the end of their production line to check the quality of their pellets as they came off the line, ready for packaging and shipping. As the pellets came off the line into the cooling hopper, Greene Team needed to hit a moisture target of 4.5 to 6.5% for the pellets to burn at an optimum level and produce the ideal BTU for consumers. They explored a number of analyzer options to measure the moisture content of the finished pellets in the hopper and selected the MCT360 in-line moisture sensor from Process Sensors Corporation® (PSC).

The MCT360 could provide an accurate real-time moisture reading, with an accuracy range of $\pm 0.1\%$, so for quality control purposes it was an ideal solution. The MCT360 installed at the hopper also provided Greene Team with process control, as they could make adjustments upstream to increase or decrease the moisture as needed if they identified variations in the moisture content of the finished pellets. It also enabled them to make fewer manual moisture measurements post-dryer, saving them additional time and labor.



“Marty came to the plant to see how the line was set up and came back to us a couple weeks later with a sampling concept. We reviewed it with our operations team and some minor adjustments had to be made, and it took some time to actually build and implement it, but otherwise it was a great solution to do what it needed to do.”

More Automation; More Savings

As much as Greene Team relied on the MCT360 for QC and process control, they knew they could benefit from an NIR sensor post-dryer to identify moisture levels and further optimize their process efficiency. To make that happen, Greene Team reached out to their PSC sales rep Marty Peters to inquire about another analyzer. Marty recommended the MCT460-WP, the next generation in-line NIR sensor built specifically for the wood processing industry. As Marty assessed Greene Team's line, the primary challenge was to figure out how to automate the sampling process—pulling a sample to get the MCT460-WP enough material to obtain an accurate reading.

Continued Galis, “Marty came to the plant to see how the line was set up and came back to us a couple weeks later with a sampling concept. We reviewed it with our operations team and some minor adjustments had to be made, and it took some time to actually build and implement it, but otherwise it was a great solution to do what it needed to do.”

Once the sampling solution was in place, Greene Team worked to incorporate the data into their process control and tie it back upstream into the dryer control mechanism. If the moisture level post-dryer was too high, the dryer heat was automatically increased. If moisture was too low, dryer temps were decreased. This fine-tuning of the dryer enabled Greene Team to optimize their energy usage and realize immediate cost savings.

Quality Control, Process Control, and Safety

With two PSC NIR sensors now in place on their line, Greene Team was able to drastically improve the quality and process control of their operation which resulted in significant labor and cost savings. But there was still one more component of their operation that they felt they needed to address—fire safety.

Much of the raw material that Greene Team brings into the plant is from area saw mills. But they also started sourcing saw dust from local hardwood flooring plants which tends to have a much lower moisture level than the material coming from the saw mills. The first stop for these incoming raw materials is into the dryer to bring the moisture level down to where it needs to be for the press. If the moisture level of the raw material is too low, fires can break out in the drying area, causing a very dangerous situation for Greene Team personnel and the potential for severe damage to the plant and equipment.



“Marty and the team got us up and running with all three sensors, and it never felt as though he was trying to sell us something; he simply made every attempt to come up with a solution that works.”

Installing another MCT460 on the line at the intake allowed Greene Team to identify moisture levels of the incoming raw materials. Depending on the moisture readings at this location, Greene Team personnel can either adjust the temperature of the dryer or change the mix of the raw materials—specifically blending in an amount of saw mill material—to increase the moisture level to make it safe enough to pass through the dryer.

A Terrific Partnership

With the three PSC on-line NIR sensors now in place at the plant, Greene Team can optimize efficiency, ensure a high-quality product, and provide a safer work environment—all while running the line for three shifts at a pace that keeps the operation moving effectively and efficiently. The PSC products don't need regular maintenance, and the Greene Team personnel have implemented an automated monitoring system to ensure that the sensors and the real-time data they generate are always as accurate as possible. Should the Greene Team staff ever have questions or an issue with the analyzers, they know that Marty and the knowledgeable customer service personnel at PSC are just a phone call away. Says Galis, “Marty and the team got us up and running with all three sensors, and it never felt as though he was trying to sell us something; he simply made every attempt to come up with a solution that works. Now we've optimized our operations to the point where we have very little waste, saving us much time and money with our process. If we ever have an issue with the PSC sensors, we make a call and their experts are on it immediately. Marty even stops by to say hello and check on us if he's in the area, and that's a great feeling: to know that he cares about the success of our operation. You just don't see that these days, so we're thrilled that we made the choice to bring them on board. It's been a terrific partnership.”

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