

BRICK & CLAY RECORD: Taking Advantage of Waste

by Christine Grahl

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Logan Clay Products Co. in Logan, Ohio, has always been in the waste business—wastewater, that is. For more than 100 years, the company has produced the high-quality clay sewer pipe specified by municipalities from New York to Chicago to the Carolinas.

Waste in its manufacturing facilities, however, is a completely different matter.

The company prides itself on having an environmentally friendly product and efficient manufacturing process; 100% of Logan Clay's internal manufacturing waste is recycled in the factory, and the energy required to manufacture its clay pipe is substantially less than the energy required to manufacture other kinds of sewer pipe, especially polyvinyl chloride (PVC), one of clay pipe's main competitors. But to a company focused on continuous improvement, "substantially less" just isn't enough.

"We're constantly evaluating our operations to determine where additional improvements might be needed," says Plant Manager Bill Heft.

Plant 2 Revamp

Several years ago, those evaluations turned up an outdated, unreliable burner on the tunnel kiln preheater in Plant 2 at the Logan site. Logan Clay turned to Lawrence Bauer at SBL Kiln Services Inc., Bridgeville, Pa., who recommended a revamp of the plant's waste heat system.

"We had already been using waste heat in the plant, but not to its full capabilities," explains Heft. The waste heat from the kiln was directed either to one of the plant's two continually cycled drying rooms or to the tunnel kiln preheater, depending on where it was needed. Additional burners in the preheater and on top of the dryers were used to help supplement the heat. Besides using more fuel than necessary, the system was unstable and unsafe. "The preheater burner was an accident waiting to happen—we simply had to replace it," says Heft.



The ductwork in Plant 2. The expanded section is the "Torpedo."



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Floor space in Plant 2 was limited, so the new control panel was nestled alongside the kiln.

Logan Clay planned the revamp for downtime it had already scheduled in late 2003 to reduce inventory levels. SBL's design involved removing the preheater burner and installing a new Maxon burner in the waste heat duct, along with new controls and positive sealing dampers to more effectively direct the waste heat from the kiln. SBL subcontracted Danser Inc., Parkersburg, W.Va., to install the new inline burner in the insulated "Torpedo" (see Figure 1). The entire project took one month to complete, but the results were evident almost immediately.

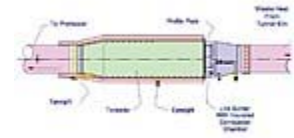


Figure 1. A schematic of the "Torpedo" design.

"We expected to save 40-50 thousand cubic feet (mcf) of fuel per day as a result of the upgrade. Once we got the plant back up and running, we started adjusting the heat flow and turning off burners. We just kept backing things off and shutting off burners we didn't need, and we found that we had more than enough waste heat coming off the kiln to do operate both dryers and our preheater," says Heft.

Within weeks, Logan Clay was saving 100 mcf of fuel per day. "We can now direct the heat to go to the dryers more efficiently or to the preheater, wherever it's needed, and we're not throwing heat away like we used to," says Heft.

According to Bauer, both the burner itself and the way it was installed directly in the duct were key to the project's success. "The design is fuel-efficient and provides excellent burner turndown, stability and reliability," he says. "The system doesn't require a combustion blower, which is another area of energy savings, and it doesn't create hotspots on the ductwork. Maintenance has also been minimized with this design."

The upgrade paid for itself within three months-and that was with fuel costs at \$6/mcf. "The safety of the system was our primary concern at the time," says Heft. "However, with natural gas as high as \$8-10/mcf now, we've seen some tremendous fuel savings from that project."

Additional Upgrades

More recently, Logan Clay has turned its attention to its five batch dryers in Plant 1. In early 2006, SBL revamped one of the dryers by replacing two large burners, which used 2 million BTU of natural gas combined, with one Maxon burner, which requires 1 million BTU; installing a drop ceiling; and changing the airflow.

"We're still fine-tuning the system and working on some programming, but the bottom line is that we're saving anywhere from \$900-1000 in natural gas each cycle," says Heft.

Heft expects the payback on this upgrade to take a bit longer-a year and a half to two years-but he points out that even slight improvements can have a big impact on a company's overall efficiency. "As we continue to make Logan Clay more efficient, the payback numbers are going to be harder to achieve because that window of opportunity is going to be smaller. The project on our tunnel kiln [in Plant 2] addressed a major problem. In Plant 1, we have four more dryers on which we're gathering data to find out how efficient or inefficient they are, and then deciding whether they warrant a rehab. As we continue to go down the line, we'll see smaller improvements incrementally."

However, in a highly competitive market such as sewer pipe, an efficient operation can be a significant advantage. "Clay pipe is a challenging market. But it is somewhat of a selling point to bring people through the plant and let them see that we're keeping up with industry and operating with state-of-the-art equipment. When municipalities pay for the product, they know that they're not paying a lot of excess overhead for inefficient operations. We want to make sure we stay as efficient as possible," says Heft.

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SIDEBAR: Benefits of Inline Duct Design

- No combustion blower required
- Very fuel-efficient
- Excellent burner turndown and stability
- No hotspots on the ductwork
- Extremely low aldehyde emissions
- Low maintenance
- Excellent reliability
- No floor space required

Source: SBL Kiln Services, Inc., Bridgeville, Pa.

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