

A New Kind Of Intelligence

Brick By Brick

Earlier this summer, Boral Bricks Inc., the nation's largest brick manufacturer and distributor of masonry products, announced its Terre Haute, IN manufacturing facility had received LEED (Leadership in Energy and Environmental Design) Gold certification from the U.S. Green Building Council (USGBC).

Each rating system requires buildings to meet criteria in five specific categories, including: sustainable site development, energy efficiency, water efficiency, materials and resource selection, and indoor environmental quality.

IMPO recently spoke with Greg Camp, plant manager of Boral Bricks' Terre Haute facility, about the motivations behind this daunting undertaking in sustainability.

What were the primary reasons behind attempting the LEED certification? What was Boral hoping to address?

Boral as a company is determined to be a leader in responsible environmental stewardship. It only made sense that the newest flagship facility be constructed and operated in such a way as to be a leadership beacon. If, as a company, Boral was not focusing on creating and maintaining a sustainable business in regards to the community and environment, then we would be failing to do our jobs.

Describe some of the biggest hurdles in the process.

It has really been a two sided coin in many respects. On one side, from inception we knew this project would have a goal of LEED certification, so some things were already planned and set. Others, in regards to material selection, component selection, and working relationships with energy providers, required some additional research, planning, and negotiating. In a lot of ways, the compromise to obtain the best possible balance of efficiency, cost, and adherence to environmental principles required some proficient hurdling.

On the other hand, creating a workforce culture to sustain the operation of the facility with the highest standards in regards to LEED and sustainability is a constant and ongoing process—one we have to be quite diligent with.

Explain some of the most notable results. Were there unforeseen benefits from an operations standpoint?

For one, definitely the use of a green energy source from the landfill has allowed us to operate with some reduced energy costs. The creation of a workforce culture that cares about being sustainable also cares about doing an excellent job. The education level and culture are the biggest benefits from an operations standpoint.

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Published on Industrial Maintenance & Plant Operation (<http://www.impomag.com>)

Boral is something of an energy efficiency leader. Discuss some of the ways the plant has been able to attain a zero waste status.

We have to work daily at this. The general waste streams normally associated with our business had to find another use or outlet. We reuse all raw materials for making a green brick; they immediately go back into the feed stream. Process water is reused as well, and we have a closed loop liquids system that allows for this. In cases where direct reuse is not possible, we had to find other outlets. We use fired brick bats to make road bases for our mining operations, for example.

The downturn has created an uphill climb for suppliers to the residential build market. How has Boral navigated this? What do you anticipate for the future of the company?

With the decline in the residential housing market, Boral, like other building product manufacturers, has taken its share of lumps. The facility in Indiana did not hit full stride and Boral has adapted quickly. Marketing of our products to builders of LEED certified construction and other environmentally concerned projects has been a priority; as has been structuring our sales efforts to best meet the local demand. Recently a paradigm shift in how we do business is occurring. A focus on “lean principles” is paramount to allow us to adjust to the fluctuating financial environment.

For more information on LEED, visit the U.S. Green Building Council website at www.usgbc.org [1].

Bottle Maker Manages Compressed Air Use, Energy Costs

Saint-Gobain Containers is the world’s largest building materials company, and a global leader in the production of high-performance materials and glass containers. Among its products are wine bottles and other containers for the food and beverage industry. The bottle-making process requires use of compressed air, in some fashion, on or around every piece of production equipment.

Leaks, a frequent problem in compressed air systems, create inefficiencies that add to manufacturing costs. Saint-Gobain Containers set out to find an effective approach to detect system leaks that did not require a large capital investment in monitoring and management equipment.

In complex or large systems, leakage monitoring and detection systems can be costly and time consuming. Knowing this, Greg Rhames, an energy engineer at Saint-Gobain Containers’ Madera, CA plant, set out to find a low-budget way to discern and reduce energy waste from three 1,250 horsepower compressors that run 24/7.

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Rhames decided to pursue what he describes as monitoring from “an equipment-based perspective.” This runs contrary to the more common method in the industry of placing large meters of varying types close to the supply side of a compressed air system. Rather than monitoring total system output, he sought to analyze performance of individual pieces of equipment, pinpointing problems at their source through measurements taken with data loggers.

“Instead of looking at this from 300,000 feet, we were looking at it from 1,000 feet,” he says. “You can get solid results by going to the equipment and working your way back versus monitoring at the supply side. From the supply end, you have no resolution on issues causing the leaks downstream.”

Rhames devised a monitoring system that uses an Onset HOBO® Energy Logger, a portable data logger which includes snap-in “FlexSmart” modules that convert signals from nearly any type of sensor. The 15-channel data logger can measure compressed air, gauge pressure, kilowatt-hour output, voltage, current, air velocity, temperature, and a range of other parameters. For Saint-Gobain Containers’ purposes, Rhames needed the data loggers to measure the CFM consumption of every piece of equipment in the plant that uses compressed air. To accomplish this, Rhames installed compressed air flow meters from CDI Meters, the 5200 Series with remote displays, which he connected to the FlexSmart modules.

Rhames placed two data loggers in one of the centralized equipment control panels. During installation, he performed a ten minute logging test and gathered the results to verify all components were operating correctly. He then redeployed the logging devices and left them to record for 24 hours. He recorded the air flow measurements every two seconds.

Using Onset’s HOBOWare® Pro graphing and analysis software package, he set a baseline measurement, studied the effects of various corrective actions, compared historical records, and established benchmarks. Most of the machinery cycles between 2-15 seconds, depending on what’s occurring. By stretching the data out over the course of the day, anomalies in the system became apparent.

The individual pieces of equipment should lose no more than 2-10 CFM. If there is a loss of more than 10 CFM, he says, “you should analyze the equipment and see where you’re losing air. Find it, fix it and bring it back down to tolerance.”

“The data so far shows we’re losing 20 to 30 CFM because of leaks,” he added. “It’s amazing how much waste occurs on one piece of equipment.”

Using the energy logging equipment, Saint-Gobain Containers identified the worst compressed air leaks, resulting in a 10 CFM decrease in compressed air waste. As a result, he says, “the savings could be huge—possibly tens to hundreds of thousands of dollars annually.”

To learn more about data loggers, please visit www.onsetcomp.com [2].

Hazard Concerns Motivate Green Gas

It has long been an accepted fact of life in the propane business that the purging of propane storage or transport tanks—whether for their maintenance, refurbishment, end-of-life disposal, or after an accident—results in small amounts of propane either escaping, being burned off, or venting into the atmosphere. However, as the price of propane continues to escalate and the regulatory eye of such bodies as the U.S. Environmental Protection Agency (EPA) focuses more and more on the venting process, propane handlers and retailers are looking for economical ways to recover and reuse these vapors. One way to contain and control these fugitive vapors is an enhanced vapor-recovery system.

“What we’re seeing is that when the price of propane spiked, it increased the interest in vapor-recovery systems,” explains Mark Wenik, Product Manager, Plant and Industrial Equipment for Ray Murray, Inc., a distributor of propane-gas equipment and appliances headquartered in Bensalem, PA. “At \$2 a gallon, there’s more incentive to invest in a recovery system than when it’s less than a dollar a gallon. With the economy the way it is, every dollar saved is significant and every gallon recovered is another gallon you don’t have to buy.

“Also, what we’re seeing is that a lot of bulk plants were originally in industrial or commercial areas with very few neighbors. Now, there is an encroachment of industries and businesses around the bulk plants. Before, a marketer could vent gas without issue. Now, the neighbors complain about smelling gas when a tank is being vented or blown down and they’re concerned about it being a hazard.”

One of the companies that has taken note of the shifting landscape in regards to propane emissions and also identified the inherent value in recovering vapors is Hydrostat, Inc., Rice, MN. In business since 1999, Hydrostat is a hydrostatic tester and re-qualifier of industrial cylinders with the capability to inspect, test, and recondition a wide variety of cylinders, among them propane. In the wake of a recent plant expansion, and knowing that continued propane emissions could not be tolerated, Hydrostat turned to Ray Murray for a solution to the propane it was losing during the tank-reconditioning process.

The decision was made to install a 10-rack vapor-recovery system that features LB Series Reciprocating Gas Compressors from Blackmer®. The oil-free compressors are perfect for the job because they have been designed to deliver high efficiency in handling propane and are ideal for vapor-recovery applications. Following this upgrade, rather than blowing gas into the atmosphere and wasting it, the recovered propane is now transferred into a 1,990-gallon tank that’s piped right into the facility’s makeup air and heating system. This now allows Hydrostat to use the recovered propane to help heat its headquarters.

Recovering the propane and reusing it for heating purposes was such a unique aspect of the project that it was deemed an environmentally friendly “green”

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project by Benton County, MN, the home of Hydrostat. This allowed the company to qualify for a state grant that covered 50 percent of the project's cost.

"The county approached us and said it had grant money available for recycling," explains Stacy Schraut, Owner of Hydrostat. "They reviewed our application, I made a presentation to the board and told them, No. 1, this helps the environment, No. 2, we're recycling propane and, No. 3, we're conserving energy because we won't be using natural gas to heat the building. After that, they came back and said the project qualified for the grant money.

"The entire project for us, overall, was really a no-brainer," Schraut continues. "We had all these cylinders coming in with product left in them. We crunched the numbers and found that we could pay back the system in just 18 months based on our recovered natural gas. With the grant from Benton County, the actual payback is now less than 12 months."

For more information, visit www.blackmer.com [3].

Source URL (retrieved on 12/26/2014 - 9:30am):

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[1] <http://www.usgbc.org>

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