

SEALED WITH A GLASS FIBER ROPE

By Christine L. Grahl

Reprinted from Ceramic Industry

In the brick industry, competition is stiff and the labor market is tight, leaving little room for error on either side. As a result, today's plant managers have two main priorities: producing quality products and streamlining their production processes.

Ashley Turner had similar goals when he joined Boral Bricks about two years ago as plant manager of the Macon, Ga., facility. The 20-year-old plant produces about 48 million modular bricks per year for both the commercial and residential market. Product is conveyed through the dryer and the Swindell Dressler kiln on 121 kiln cars, each 15 ft wide. A lot of things can go wrong in a 20-year-old plant, and Turner was prepared for just about anything. What he didn't anticipate was that something as seemingly insignificant as a kiln car seal would pose such a big problem.



Each time a kiln car seal required replacing, employees had to cut several strips of 4- to 5-in. wide fiberglass mat, wrap it in chicken wire and then roll it up to fit the kiln car. Pieces of packaging strap were used to attach the seal to the car. "It was a laborious process putting it together, it was a very ineffective seal, and we couldn't perform enough maintenance on it," Turner said. "The only time we changed it was when it was absolutely destroyed. The seal was so inefficient that it really should have been changed every second cycle, but there just wasn't enough time or manpower to get it done."

The result: cold spots in the kiln, which caused some of the brick to be underfired, and an excess use of fuel in an effort to correct the problem.

THE SEARCH FOR REPLACEMENT SEALS

Turner knew he needed new seals, but he didn't know where to look. Then, in July of 1999, the solution arrived on his doorstep—literally. Turner opened a package to find a sample piece of 1 x 3 in. fiberglass rope, encased in stainless steel mesh.* At first glance, it looked like it was just what he needed. But Turner didn't want looks—he wanted results.



"I called the supplier and asked for some 15-ft-long samples of the seal. We then went through a trial period by running the sample seals through a couple of cycles," Turner said.

"We were really testing whether the seal would maintain some form of its size after compression between the kiln cars. A kiln car seal that is high in volume but lacks density flattens and remains flat as soon as the kiln cars are pushed together. Very few materials in our industry can withstand the kiln's heat and be light enough to maintain some sort of spring action, but maintaining a post-firing thickness is quite important," he said. According to Turner, the sample seals lost only about an eighth or a quarter of an inch during the first cycle of the trial, and then maintained their basic size and shape after that point. Turner was hooked. He placed



an order to cover all 121 of his kiln cars, spreading the delivery out over a four-month period to help alleviate the cost burden. “Like any good product, these seals weren’t cheap. But I thought they would be well worth the cost,” Turner said.

EVALUATING THE PAYBACK

It didn’t take long for the new seals to pay off. The main benefit was a savings in labor requirements. “Once all the kiln car seals were installed, the amount of time the employees spent installing and maintaining the kiln car seals was reduced by about 95%,” Turner said.

Turner was also impressed by the durability of the seals. In the year that they’ve been in operation, very few of the seals have needed to be replaced due to failure, and failures that have occurred were the result of impingement.

“If you mount them properly, make sure they stay in their place, and make sure you get a program of cleaning any brick chips or anything that might get wedged in the top, the life expectancy of the seals can be increased tremendously,” Turner said. “Most of our original seals from a year ago are still in place and performing well, and our cars do 1.05 cycles per week. That would indicate that those seals have successfully done 52 cycles, where the old kiln car seals probably should have been changed after 2-3 cycles.”

Yet another benefit of the new seals was the ability to maintain a constant kiln atmosphere. “In the pressurized parts of our kiln, we’ve reduced the amount of heat getting under our kiln cars, and in the negative parts of our kiln, we’re no longer sucking in great amounts of cold air. This has enhanced our product quality and also enables us to save on fuel,” Turner said. “We’ve also eliminated our cold spot problems, so we no longer have to worry about underfired brick as a result of inefficient seals.”

The fiberglass rope seals designed for Boral Bricks’ Macon plant aren’t for everyone. “If you have a very pressurized kiln, you’re obviously going to get a lot of heat on them; if you’re running sawdust, you’re going to get a lot of acids that could be detrimental,” Turner said. “The success of these seals, and their life expectancy, really depends on your process.” For processes over 1000°F and other difficult applications, higher-temperature resistant ropes and/or custom designs may be required.

For Boral Bricks’ Macon plant, the fiberglass ropes were a perfect fit. “The old style was so archaic and so ineffective, changing to something like this, especially after we got a chance to trial it through the kiln, comes under the category of a ‘no-brainer,’” Turner said.

*Supplied by Davlyn Manufacturing Co., Spring City, PA