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## It's all about the brick

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rotary kiln is a very demanding component of a cement plant. It has an insatiable thirst for refractory. Not just any refractory will quench its desire. It requires a particular dimension composed of a certain compound, lined in an exact manner before it will even consider performing its job. Even then it retains the prerogative to squeeze the life out of a functioning cement plant, based on the performance of the same refractory brick it cannot work without.

Such expectations are difficult to live up to, especially when they are put on the small shoulders of refractory bricks. Although small in comparison to the metres of kiln they are responsible to line, refractory bricks have a huge responsibility. As a refractory maintenance equipment manufacturer with over 40 years experience, Bricking Solutions understands the importance of these small components and have made brick management the core of its Circle of Refractory Maintenance programme.

#### **Brick management**

As the North and South American Sales Associate and one of Bricking Solutions' Field Service Technicians, Andrew Smith has spent a fair amount of time out in the field supporting customers as well as their refractory maintenance equipment. Andrew finds himself repeatedly explaining that even though the company's bricking machines can stand alone as the safest and most efficient way to install the brick, modern refractory maintenance can only be optimised to its fullest capacity when the main focus is placed on brick management. Such a focus should not begin and end with ensuring the correct brick is supplied during maintenance. It should start with the ability to safely inspect and repair hot spots, quickly and safely remove old brick, and end with efficiently supplying brick to bedding and bricking crews while maintaining the life of

With brick management at the core of Bricking Solutions' Circle of Refractory Maintenance programme, this article explains the key to optimising such an approach and why it can be the most economical path to take.

the refractory brick and lessening worker fatigue and injury.

The key to brick management is thinking outside the brick by making it the bigger aspect of the job. Thinking inside out, so to speak, is intimately knowing the important measurements of your kiln: its diameter, length, tapers, conical sections, etc. Starting here is not only important for choosing the right refractory, but also in knowing the correct tools needed for bricking management. It is the same place the Circle of Refractory Maintenance begins.

### Planning for brick management

But knowing your kiln's measurements is just the beginning to bricking management optimisation. Refractory maintenance should be planned out from the very beginning. The highest optimal management will include answers to questions like, how will the kiln be accessed so brick management can begin? What is the safest procedure for inspecting brick for hot spots and what is the safest way to repair them? How can tear-out of old brick be optimised and debris removal be more efficient? What procedures will be used to supply brick to bedding and bricking crews? Is it the most efficiently safe method for both brick and crew? By utilising correct kiln measurements in conjunction with making the best brick management plan possible, focus can be placed on the complete refractory maintenance programme.

In the current economic climate, plants are seeing more than just a reduction in budgets. The reductions trickle down to layoffs with plants utilising minimum workforce to keep them up-and-running. Optimising a plant's brick management program during an outage is the most economical path to take. Making a



plan before an outage can ensure the safest most efficient method to brick management. The best place to start is with existing equipment. Regular maintenance on existing equipment ensures it is in good working order before it is put into use.

Many of Bricking Solutions' current customers have taken advantage of its equipment service plan by having one of the company's in-house technicians on-site 30 days prior to an outage. A preoutage evaluation will not only guarantee machinery will function 100 per cent to manufacturer's running specification, but also ensures missing spare components are available and in stock. This can eliminate small repairs by addressing them before an outage, and provides onsite training for key plant personnel to repair the machine during and after the outage. This has proven successful for plants that may experience unexpected outages by being prepared for the unexpected. In North America, just over 90 per cent of plants own their own bricking machine. Time



and time again plants put their trust in the contractors to provide maintenance and repair for equipment that's not theirs. This responsibility should always be the plant's. A dedicated department should look after the machine twice a year; before and after each outage.

#### Optimising brick management

Once available equipment has been inspected and repaired where necessary, it's time to address optimisation of brick management during the outage inside the kiln. Accessing the kiln, performing tear-out, and removal of debris addresses management of used brick and although important to the efficiency of the entire refractory maintenance programme, the focus of this article is optimising brick management during installation. It is here where optimisation is often overlooked.

An argument can be made from all sides of North America as to what is the best practical procedure to brick a kiln. Do you bed the kiln first then do the tops or do you bed the kiln just far enough and then bring in a bricking machine to work in tandem with the bedding crew running tops and bottoms simultaneously?

In Bricking Solutions' opinion, the latter is the most efficient procedure. In a confined space with a large crew only so many hands can lay a row up to spring line. It makes sense to focus the install job simultaneously. This allows for less correction, less mud/mortar used, and total crew optimisation shift by shift. But we all can agree that either way with the machine in the kiln brick needs to be passed from down kiln to up kiln.

Recently, Bricking Solutions commissioned equipment for a new line in the northeastern US. Like most plants in the states they utilised a contractor to perform for the refractory installation job. The contractor shared the company's opinion about bricking tops and bottoms stating he found it was the most efficient method. But this is where the shared opinion on optimising equipment and personnel for kiln lining stopped.

After they bedded the kiln deep enough, the bricking machine was assembled in the kiln ready to close out the first row. What was soon apparent was that the bricking machine was not supported by the right equipment to feed brick to the bedding crew and the masons on the bricking machine. Outdated equipment such as a roller conveyor was set up and used to pass brick one by one up kiln on top of the roller conveyor which consumed as much as seven key personnel. It took almost 1.5 hours to set this system up and move half a pallet of brick under the machine up to the bedding crew where it was staged. No bedding was being done due to all the hands required to move one brick at

It was here that Bricking Solutions realised a smaller component of the Circle of Refractory Maintenance had been overlooked: a Port-a-Trac. Unlike smaller components like screws and nuts which are necessary to keep a bricking machine together much less working properly, this innovative brick transfer system is a supportive component adding efficiency, less worker fatigue, and improved brick management to the modern pneumatic bricking machine. This smaller supportive component was designed a decade ago with the sole purpose of feeding brick to bedding and mason crews while utilising

only a maximum of two workers so brick management didn't interfere with brick installation.

In 30 minutes a Port-A-Trac can be installed in a kiln reaching under the bricking machine to the bedding crew. With a dedicated fork lift operator and one labourer a 3000lbs pallet of brick can be pulled up kiln by an electric power winch to the bedding crew to keep production moving swiftly. Utilising this procedure optimises your manpower by allowing five of the seven crew originally passing brick one by one to move onto more important jobs within the kiln. So many times it has been heard of project managers scrambling to put guys on different jobs to meet schedule deadlines, which usually meant the first highly-trained crew members, would be pulled onto another job. While less-trained crew members were left operating the bricking machine causing inconsistency in the installation job. And if you are already short-handed thanks to layoffs necessary in our current economy, this only leads to longer work days, overtime, and worker fatigue.

The most beneficial aspect of utilising a Port-a-Trac is the reduction of brick handling, which adds up to less brick damage increasing brick life. Moving brick one by one on to a roller conveyor and than staging the brick for bedding and bricking crews doubles brick handling, which decreases brick life enormously. Not to mention the wear and tear on the backs, necks, and shoulders of those handling the brick. Then you've added worker fatigue and injury to your list of delays. Optimisation just flew out the window.

No one wants to lose money, especially

during the current economic crunch. Optimising current equipment through proper maintenance prior to an outage can reduce repair costs and outage time all on its own. But if you're beginning to look and plan for a refractory maintenance programme, start by knowing your kiln's measurements and then plan to utilise the most innovative and modern refractory maintenance equipment available. Planning for brick management optimisation will lessen the burden on the shoulders of your brick as well as your crew because in the end, it is all about the

