

# Anatomy of a Bricking Machine

## Successful Transplant

By Don Coates



*It was a normal rainy afternoon in Monroe, Washington. The shop was full of activity. Frames were being welded together. Arches were being methodically assembled. And parts were being carefully packaged. The job board was full of orders from customers new and old. Cargo was ready awaiting pick up for shipment to far away ports. A busy organized shop - I liked it that way. My name is Don Coates. I am the Production Manager for Bricking Solutions. And this is my job.*

*The phone call that came in next was from a refractory installation contractor working at a job site in Texas. He was distraught and looking for answers. Seems the lubricator filter on one of our bricking machines he was using had been destroyed. He also advised me that several cylinders on the machine were leaking. It didn't look as though any preventative maintenance had been done and there were no spare parts to be found. The machine was down and costly outage time was ticking away.*

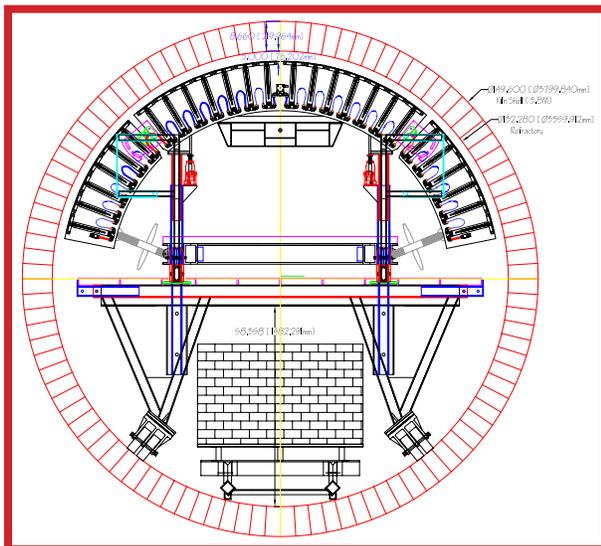
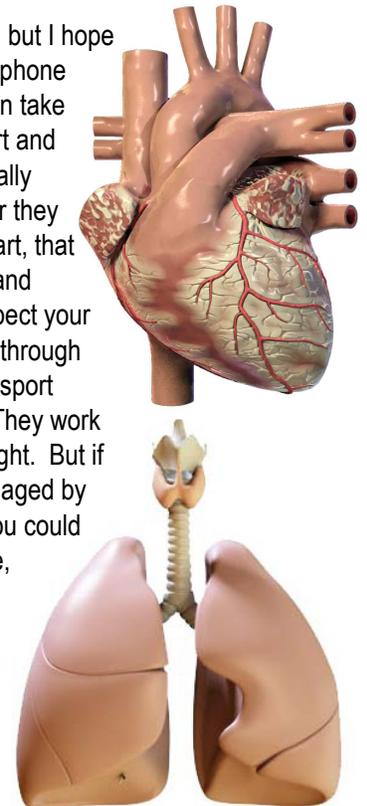
*The warning signs were obvious. The machine was experiencing a heart failure and lung collapse. It would need a heart and lung transplant immediately. Without a new Master Valve and Lubricator Filter it couldn't be revived and the outage time clock was still ticking away. Since bricking solutions was all I did, I knew what needed to be done, but I would not be able to do it alone.*

*A quick call to Mike Kelly of Ash Grove Cement in Midlothian, Texas who was just a few miles away from the contractor confirmed he was the guy who could help. He always carried a spare Lubricator Filter and Master Valve for just such an emergency for his own machine. He could spare what he had and arranged for the refractory installation contractor to pick*

*the parts up that day. I simultaneously sent Mike a replacement shipment as well as a spare unit to the contractor. With split second timing the parts arrived and in less than 2 hours the heart and lung transplant was flawlessly performed. The machine was quickly revived and the outage loss time clock stopped. It was just another success story from the rainy city.*

Granted, a little cheesy, but I hope I got your attention. That actual phone call brought to mind how we often take a lot for granted. Like, your heart and lungs will continue to work normally despite the normal wear and tear they are put through. For the most part, that is true. With regular check ups and basically good living you can expect your heart to continue to pump blood through your body and your lungs to transport oxygen into your bloodstream. They work without a given conscience thought. But if put under undue stress or if damaged by outside influences or disease, you could experience a heart attack, stroke, or the effects of emphysema or asthma. Without warning you could have chest pains, shortness of breath, nausea, confusion, or difficulty breathing. Since I am sure you are like me and would prefer to be picking daisies rather than pushing them up. Taking care of ourselves with eating well, exercising, and attending those fun regular doctor visits becomes important.

In the same manner, keeping up a safe, efficient, and productive pace during refractory installation is far more desirable than twiddling your thumbs watching the outage clock tick.



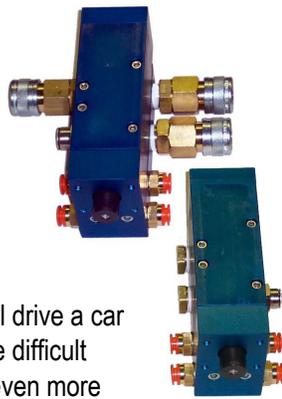
Desirable or not if the refractory maintenance equipment is not being maintained properly, you will be twiddling more than your crew will be installing. As with any machine, the components that make up the whole are important to its function. Some of those components are more important than others. You can still drive a car without a back seat, but it would be difficult to drive without tires. It would be even more difficult if you did not have a spare tire and had never learned to change a tire. Understanding those important components, what they do, and how to keep them working is a key to effective productivity.

For those who own or use any of the Bricking Solutions' rotary kiln bricking machines, you are already aware of the importance of the Master Valve and Lubricator-Filter system. For those who will some day own or use one of our machines you are about to learn what the others already know. These two components are the most important ones. They are what we would call the "Heart" and "Lung" of our bricking machines. They keep the machine breathing and pumping so the brick can be installed safe, fast, and efficiently. Without preventative maintenance and basic repair knowledge, their failure or collapse can eat away precious time and company profits causing you to become dead in the refractory zone.

The "HEART" of our machine is a set of two 3-Way Master Valves. Positioned on the down kiln and up kiln arches, the 3-way air valves allow for rapid advancement up the kiln by engaging or releasing cylinders simultaneously or individually without resetting. I think most would agree it is better for this set of valves to be holding up the brick rather than doing it by hand. Keeping the "HEART" pumping and knowing the signs of a heart failure will reduce or even eliminate dead time.

The first step is to keep replacement parts in stock. These would include one of the following: Master Valve repair kits (ASM461); loaded Master Valve body (MV441); and a complete Master Valve

Master Valves



Lubricator-Filter System

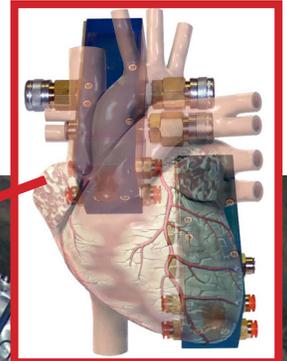


assembly (ASM465). Having any one of these as a spare part on your inventory shelf will do nothing but save your company lost profits if the heart of the system should fail.

The second step is to know the warning signs and what to troubleshoot. As outlined in our Maintenance and Repair Guide, the reaction of the cylinders is the key. If they extend too slow, you need to check the Master Valve and replace the necessary components. A possible plugged or almost plugged muffler could cause the cylinders to act sluggish. Muffler replacement is recommended rather than attempting to clean them. A pre-outage evaluation and inspection of the Master Valve will eliminate problems before you are in the kiln.

The "LUNGS" of our bricking machine is the Lubricator-Filter system. Without this system maintaining clean dry air and continual lubrication to the pneumatic system, the life of the bricking machine would be short lived. Keeping those "LUNGS" breathing smoothly and recognizing the signs of a lung collapse shortens the time ticking away on the outage time clock.

As with the heart, keep replacement parts in stock for a collapse. These would include: Emergency Shut Off Valve (AF457 ); Filter (AF100); Regulator for setting machine air pressure (AR200),



Lubricator (AL100); and last but not the least, the Check Valve (CV004), which if air to machine were lost will hold pressure in check to all activated cylinders until you can correct loss of air. It is important to note that the check valve is a safety feature that should not be removed from the machine. In fact, rather than replacing any of the above items directly on the machine, it would be better to have a complete Lubricator-Filter system (ASM500) on hand to install in place of the collapsed one. Then you could make repairs on it with the replacement parts and have it ready for another outage. Once again, take a look at your spare parts and consider these items as essential tools needed for you to safely, efficiently, and productively complete refractory installation next time you prepare to set your machine in motion.

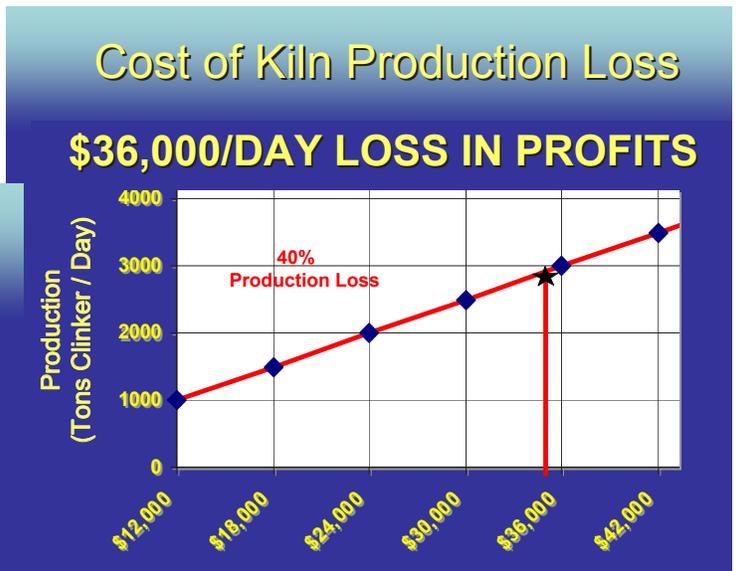
Component adjustments during the pre-outage evaluation can significantly reduce down time. Using a small flat head screw driver the adjustment screw located at the top of the lubricator can be turned to adjust the oil flow. To increase the flow turn the screw clockwise and to decrease it make a counter clockwise turn. The air regulator can also be adjusted by pulling the adjustment knob down, setting the gauge to the recommended pressure setting on the up kiln arch and then pushing the knob in to lock it into place.

Any leakage around the lubricator or filter is warning signs of possible lung collapse. Loss of air pressure is the key to problems with the regulator. Damaged seals between all components can also cause air leaks. If either occurs, those parts need to be replaced before installation can continue. It is also important to not over work your lungs. This can occur with too much lubrication. Balance is very important. Make certain the lubricator is set for 2-4 drops per cycle of Master Valve. Eliminate problems before installation even begins through a thorough inspection of all components and a pre-outage evaluation.

The effects of a heart failure and lung collapse can be far reaching however the hardest hit is the patient's family. In our case, the family would be the respective cement plant. A study by Harbison Walker found that while the cost of refractory accounts for only 5% of the capitol cost of operation, refractory problems are the cause of 50% of kiln outages. Reducing these problems through healthy maintenance and checkups of the equipment responsible for installation will ensure safe and efficient productivity.

The steps to keeping installation moving forward in the kiln are simple ones to take. But rest assured you do not have to take them alone. A pre-outage evaluation and repair service can be scheduled onsite at your plant. One of our staff with experience in manufacturing and maintenance will walk you through the steps to ensure your next refractory installation outage is smooth, quick, and painless.

Although a heart and lung transplant was successful for our customers in Texas, it could have been avoided with preventative maintenance and a pre-outage evaluation. Having spare parts in stock as well as knowing the warning signs for heart failure and a lung collapse can be even more important. The Master Valve and Lubricator-Filter system are essential organs to the function of your bricking machine. A failure or collapse will halt refractory installation in a split second. With your new insight into the heart and lungs of a Bricking Solutions rotary kiln bricking machine and your stocked spare parts sitting right there on the shelf, you too could be the life-saving surgeon who revives the patient while simultaneously reducing lost profits incurred by an emergency or planned outage.



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