

PLIBRICO

The Mixer

First Half | 2023

A BETTER WAY TO GET THINGS DONE: REFRACTORY INSULATION

Ultra-lightweight castables reduce drying time in installation, maintenance and repairs

The quicker the refractory installation, the less downtime and the more profitable the company. Ultra-lightweight refractory gunnites offer a means of installing a large amount of insulation in a relatively short period of time. Once the wet castable impacts the surface, it stiffens quickly to avoid slumping and hardens as it dries. This means that the gunnite could be installed over the anchors with minimal time. The installer only needs to wrap the end anchors with masking tape to keep them clean for the working lining.

Ultra-lightweight castables are a sub-set of the lightweight castables category but with a very important difference: density. For example, the average lightweight castable with a maximum service limit of 2400°F typically has a density of about 80-90 pcf (pounds per cubic foot). By comparison, ultra-lightweight castables with a maximum service limit of 2400°F will have a density of about 25-30 pcf.

Roger Smith, our Director of Technical Services, recently supplied an article on this topic to Industrial Heating magazine that you can read [here](#). Also, you can listen to Roger's interview on Industrial Heating's [podcast](#).

The Cost of Production Downtime for Industrial Facilities

3,300,000

Fortune Global 500 industrial firms lose approximately 3.3 million hours of production time to machine failure.

\$532,000

The average large plant loses 323 production hours each year, amounting to \$532,000 per hour, or \$172 million per year.

82%

Approximately 82% of industrial firms experienced an unplanned outage lasting more than 4 hours in the last three years.

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“ Our business has remained robust through the first 6 months of the year, and we are optimistic about the outlook for the rest of 2023. ”

President's Corner

Welcome to the First Half 2023 Plibrico Mixer.

Despite the current uncertainty in the market caused by rising interest rates and the threat of a looming recession, our business has remained robust through the first 6 months of the year with YTD revenue 13% above plan, and while there are signs of softening, we remain optimistic about the outlook for the rest of 2023.

In July, the Federal Reserve raised its benchmark interest rate by another .25% which is the 11th increase since the beginning of 2022. This increase brings us to a 22 yr high, and while the strength

of the market continues, there are indications that the economy is beginning to cool. Leading indicators such as the Purchasing Managers Index, which tells us if the manufacturing and services sectors are expanding or contracting, has been consistently showing a softening. It's working... and this is exactly what the Fed is trying to do without going too far and causing the dreaded "R" word – recession. I have a growing optimism that the Federal Reserve will be able to pull off the soft landing every economist has been talking about.

While we shouldn't ignore the trends, we shouldn't obsess over them either. Instead, let's double down and focus on what we do best: exceeding our customers' expectations and building on the trust and confidence that were

known for. Economic uncertainty unlocks opportunities — let's capitalize on them.

To that end, we have some great activities to help us in the back half of 2023:

- Participation in AluminumUSA – Aluminum Conference in Nashville, TN in October.
- PliHeat and Conquering Aluminum Furnace Corundum Training.
- Transition to Plibrico's new production facility.

Have a great summer, STAY SAFE, and as always thank you for your hard work and dedication. I truly appreciate it.

— Brad Taylor, President & CEO
Plibrico Company, LLC

Highlights from First Half 2023

NEW HIRES

- Austin Wagoner, Northbrook, IL – Business Development
- Karinne Kirkendoll, Bartow, FL - Branch Administrator
- Elvis Selimovic, Northbrook, IL - Staff Accountant
- Jesus Quintero, Oak Hill, OH - Plant Manager
- Micha Leedy, Oak Hill, OH - Maintenance Associate
- Gavin Howell, Oak Hill, OH - PT – Maintenance Associate
- John Ward, Salem, OH - Project Manager
- Tyler Graham, Salem, OH - Production Associate



Plibrico has been a partner in the steel industry for more than a century

Plibrico Showcases Refractories for Steel Industry at AISTech 2023 in Detroit



Plibrico demonstrated at the AISTech 2023 Conference how its portfolio of refractories increase the longevity of thermal processing equipment and lower maintenance requirements for steel processors. AISTech2023 was held May 8-11 at the Huntington Place Convention Center in Detroit. The steel industry's largest annual trade show and exposition, AISTech2023 welcomed over 7,000 industry professionals worldwide with an audience representative of steel producers, suppliers, academia, and students.

Attendees at AISTech had the opportunity to stop by Plibrico's booth with their most

challenging refractory questions. While at Plibrico's booth, many attendees had their tickets stamped for a chance to win a brand new, fully loaded 2023 Chevy Silverado, valued at more than \$65,000, in the AIST Vehicle Giveaway.

Plibrico has been a trusted partner in the steel industry for more than a century. It was also the first in the industry to introduce a complete line of plastic and low cement castable refractories. Today, it has an enviable track record of providing refractories that improve productivity by extending the longevity of furnaces, delta sections, and transfer equipment.

Plibrico Department Update

ENGINEERING & TECHNICAL SERVICES

The Technical Department is working with a number of our Partners and Sales Offices to design furnace linings and develop material take-offs to quote projects. R&D is busy in the laboratory developing new materials and improving existing products. The Quality group has been busy laying out procedures for the new Pyro Plant. We have also been working to get the processes and equipment in place for the new facility.

BUSINESS DEVELOPMENT

Plibrico's Material Sales had a strong start to 2023 at 127% of Prior Year To Date Sales thru April and 119% of 2023 Plan. Several Highlights include:

- Novelis' Engineering and Purchasing groups visited Plibrico for an onsite demo of our Plicast Airlite 25 C/G and Pli Shot Si Bond materials.
- We recently completed a Stage 1 Market analysis of the Chemicals Process Industry (CPI). We received positive feedback and will develop a strategic plan to support this market segment.
- Plibrico was awarded an annual contract from SunCoke for Plicast C/G LWI used as crown insulation. Additional opportunities are being reviewed.

REFRACTORY SERVICES-SALEM

The Salem services group has been very busy. We have a new Project Manager John Ward. He is a veteran in the refractory industry has he comes to us with over 25 years of experience. On the Redi-Shapes front, we have completed the upgrade to our High Fire furnace.

Three Key Allowances in Ceramic Refractory Anchoring Design to Prevent Failures



A critical consideration when designing an anchoring layout for a suspended refractory application is factoring in movement of the anchor. If not accommodated, this movement can cause the ceramic anchor to fail, leading to a section of refractory dislodging.

Refractories expand and contract due to changes in temperatures. There are two types: Permanent Linear Change (PLC), and reversible expansion. PLC occurs during initial heat-up when moisture is released from the refractory. Reversible expansion happens when refractories go through thermal cycling. In mathematical terms, both types are accounted for by the rate of expansion, per inch, for every degree that temperature increases. Expansion rate numbers are listed on TDSs.

Ceramic anchors, as an

integrated part of the overall refractory lining, will move with the refractories during thermal cycling and initial heat-up.

Thermal expansion happens in all three dimensions: length, width, and height. The “height” aspect refers to the thickness of the installation material. Yet the larger focus should be on the other two dimensions since the installation is far more likely to move in the length and width directions. Therefore, allowances must be made to accommodate this movement.

To accommodate movement, follow these three simple steps in the design and planning of a ceramic anchoring system:

- 1 Determine how much expansion the installation requires, including reversible expansion due to cycling, and the PLC that happens only during initial bake-out.

- 2 Choose an appropriate expansion scheme.
- 3 Select an anchoring system that will accommodate these expansion requirements, including the number of anchors, anchor spacing, anchor shape, size and material.

A strong anchoring system is key to maintaining monolithic refractory lining integrity and preventing cracking, dislodging, or a total structural collapse. By carefully determining expansion, and then designing the suspension system to accommodate for movement, you'll greatly improve refractory life and prevent any possible catastrophic refractory lining failures due to a rigid and poorly designed anchoring system. Learn more on this subject by watching this brief [video](#) on YouTube.

Getting to know you: Anna Lymperopoulos

Where do you work? “I work out of Plibrico’s Northbrook, IL corporate office.”

Where do you live? “Wood Dale, IL - Where the planes from O’Hare are always flying over.”

What do you do in your free time? “Spend time with family, my dogs, and try to be out on the boat as much as possible!”

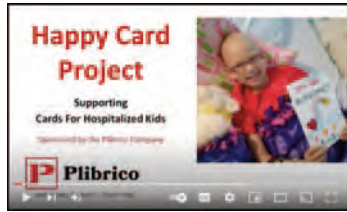
What do you like about your job? “Building relationships with all the people whose names I see during my weekly routine.”



PLIBRICO TEAM HELPS KIDS SMILE WITH CARDS FOR HOSPITALIZED KIDS

Hospitalized children can go through many different treatments, surgeries, and therapies that take up long stretches of time. During those very difficult moments, children often feel alone, isolated, and afraid. For these children, a simple act of kindness, a handmade card, can brighten their day and puts a smile on their faces.

Recently, Plibrico employees came together from Ohio to Washington, including New York, Indiana, and Florida, to volunteer their time and creativity to make handmade cards for Cards for Hospitalized Kids (CFHK). The charitable organization distributed the



Click to watch the CFHK video!

cards to children battling health issues across the country, brightening their day and demonstrating that someone is thinking of them.

Creating these inspirational cards was easy to do and fun to make. Everyone that helped had a great time coming together as a team for a great purpose. Learn more CFHK by visiting their [website](#).



PLIBRICO IN THE NEWS

Catch up on the latest Plibrico news by visiting our expanded News section at www.plibrico.com.

RECENT NEWS

Plibrico Introduces Industry First Field Enabling QR Codes

[Read on](#)

Top 10 Safety Tips: Scaffolding & Aerial Lift Prevention

[Read on](#)

Plibrico's Anti-Spalling Additives Provide Faster and Safer Dry-Outs

[Read on](#)

The Safety Spot: Tips for Safe Fork Lift Use

Forklifts weigh more than three tons and can reach speeds of over 10 mph. Some may think it would be like driving a car, but it is really very different. Compared to a car, forklifts are heavier in the rear to counter the weight being carried on the forks. And while cars have brakes on all four wheels, most forklifts only have stopping power in their front drive wheels. Also, a forklift is turned by moving the rear wheels, therefore, it has a much smaller turning radius than a car.

Forklifts are a necessity on a construction site and an incredibly useful warehouse tool when used safely. Below are tips to keep you safe.

1. Train and authorize your forklift operators - it is an OSHA requirement
2. Before each shift, examine forklifts for maintenance issues
3. Never leave an operating forklift unattended - in fact, leaving keys in an unattended forklift is illegal



4. Know and never exceed the lifting capacity of the forklift - most accidents with forklifts occur when unstable loads fall
5. Forklifts must follow designated roadways at the work site
6. Keep hands and feet away from the cross members of the mast - if it is lowered and you catch your hand, you'll suffer a serious injury
7. Avoid fast moves - always drive, stop, turn, and lift or lower the forks slowly and as smoothly as possible
8. Always travel with the forks positioned as low as possible for increased stability and protection
9. If your load obstructs your view, operate the forklift in reverse to improve visibility and operation control
10. Forklifts which are not in use should be carefully parked, with the parking brake applied
11. Always check before turning or backing up the vehicle. Keep in mind that people may be standing on your blind side.

New Products Featured & Released



Pligun Fast Track SIC HP8

[Learn more](#)

Pligun Fast Track SIC 80 TM

[Learn more](#)

Plicast Airlite 25 C/G ("Liquid Board")

[Learn more](#)

Redline Rapid Floor Patch

[Learn more](#)

Redline Cool Cast A

[Learn more](#)

Case Study: Plibrico Solution Delivers Triple the Strength Without Increase in Time or Cost to Boiler Manufacturer



An OEM of steam, hot water, and condensing boilers had been purchasing its

refractories direct from the manufacturer and following standardized, general installation instructions. These instructions, however, did not provide the details required for a quality installation. Inefficient methods of installing and securing the refractory led to the OEM's boilers experiencing premature deterioration of linings. The increased wear and tear on the boilers meant unscheduled downtime for customers and damage to the OEM's reputation.

Further, the refractory vendor's missed delivery dates were placing the OEM's manufacturing schedule, along with subsequent customer deliveries, in jeopardy. Due to business requirements and customer commitments, the OEM could not adjust manufacturing schedules and customer delivery dates. Some of the OEM's boilers were routed for other countries and could not miss their overseas transport.

SOLUTION

After thorough review of the boiler manufacturer's refractory



specifications, mixing and installation procedures, and manufacturing and delivery requirements, the Plibrico Engineering and Technical teams collaborated to develop a comprehensive solution that significantly increased the life of their boilers refractories and the value that the OEM brought to its customers.

PLIBRICO TECHNICAL TEAM

Plibrico's technical team began by upgrading the existing conventional castable the OEM had been using for insulating sidewalls to a low cement castable. It tripled the strength of the refractory lining while optimizing cost efficiency. The change also increased the boiler's resilience to a wider variety of fuel sources.

Next, the Plibrico team devised a new measuring, mixing, and dryout process that would complement the strength of the low cement castable and delivered added protection to the boiler linings.

PLIBRICO ENGINEERING TEAM

During the initial assessment, the vessel's refractory anchoring was identified as a concern. In response, the engineering team created an efficient anchoring layout that would better support the refractory, along with an improved way to weld the needed anchors to the vessel.

Plibrico's engineers also devised a new approach to attaching and locking the walls of the boiler to its floor that

greatly strengthened the adhesion between the two parts.

Plibrico's technical team went on-site at the OEM's manufacturing facility to review its recommended refractory solution, provide complete technical training to the employees, and fully support the OEM as it transitioned to the upgraded solution.

RESULTS

Plibrico was able to help the OEM provide a better product to their customer without any increases in time or cost.

"Plibrico has exceeded our expectations, and we're very satisfied with the finished product," reported the OEM's Plant Manager. "Honestly, we've never had anything that worked as well as this solution."

Due to the innovative anchoring system and tripled strength of the upgraded refractories, the life span of the boiler's refractory lining is expected to more than double. Plibrico's solution has proven to be more durable and cost-efficient, with the added benefit of withstanding an assortment of fuel sources.

Equally important, Plibrico's refractory manufacturing and logistics expertise is delivering refractory materials on-time, so the OEM can meet all its customer commitments.

[Click Here](#) to download the case study.



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