

PLIBRICO

The Mixer

2nd Quarter | 2022

5 THINGS TO CONSIDER WHEN CHOOSING A REFRACTORY LINING

Selecting an appropriate refractory lining for an application isn't always a straightforward decision

What is the best refractory material choice for a furnace? To answer this question, each application requires both an overall evaluation of the furnace's thermal processing, and a careful balancing of five critical factors listed below to find the optimal solution that meets both the immediate and long-term needs of the operation.

1. Thermal Requirements: Temperature

For any high-temperature industrial process, the primary piece of information to know is the operating and maximum temperatures. The refractory lining chosen must meet the operating temperature requirements.

Refractory linings are designed to maintain physical properties at very high temperatures – 932°F and above. Refractories used to line thermal equipment must have proper insulating properties to reduce the steel skin temperatures to acceptable levels, usually well below 300°F. structural integrity for long thermal life.

For the other four factors, read the full article in *Industrial Heating* magazine at: <https://plibri.co/5things-to-consider>

Chemical Reactions Within Refractory Linings

>932°F

Refractory linings are designed to maintain physical properties at very high temperatures

H₂

Reaction in the lining, which reduces silica in the refractory matrix at high temperatures

MgO

Corundum growth in aluminum furnaces, especially those with aggressive alloys

INSIDE ISSUE

- > President's Corner
- > Plicast Al-Rezist Introduced
- > Plibrico Coatings
- > Safety Spot



“ I want to take the opportunity to recognize you, our employees, for your hard work and dedication. It wasn't easy and everyone across all our locations worked incredibly hard, and for that I thank you. ”

President's Corner

Welcome to the Q2-2022 Plibrico Mixer.

It's been a while since we published our Mixer to communicate updates, and with all of the changes within the company, its long overdue. 2021 was a notable year for the company in many respects and I thought I would mention 3 here.

First, we grew sales by >50% over 2020 and 20% over 2019. While we all remember the turmoil that COVID caused in 2020 and the significant impact to our revenue, and so we might have expected a double-digit increase in 2021, but I don't think anyone anticipated the rapid increase we saw. The sharp increase in business, while welcomed, came with its own set of challenges – manpower, raw materials and transportation just to name a few, and I want to take the opportunity to recognize you, our employees, for your hard work and dedication. It wasn't easy

and every one of our employees across all our locations worked incredibly hard, and for that I thank you.

Second, the company made its first acquisition in recent history with the purchase of Redline Industries, a regional manufacturer of monolithic materials located in Chicago. Discussions began back in January of 2020 and while progress was “COVID” delayed, we closed and announced during the Aluminum show in September of 2021. Immediately after the announcement the team shifted its focus to consolidating manufacturing within our Oak Hill operations. In October of 2021 we produced and shipped our first Redline order from our Oak Hill operations, and in March of 2022 we had successfully transitioned 100% of the Redline production and were fulfilling all Redline customer orders from Oak Hill. While we had some bumps along the way, the team overcame them all and without question the transition was a huge success.

Building on that momentum, I am

excited to formally announce that in May we closed on a new plant that will replace our existing Oak Hill manufacturing facility. This was a project that also started pre COVID with a small team developing a long-term manufacturing strategy that included a larger facility to support our growth, automated production equipment, and the utilization of technology to streamline our operations, increase our production throughput, flexibility and quality. All while allowing us to remain in Southeastern Ohio to retain 100% of our employees. The project has just begun and is anticipated to take 12-18 months.

We will continue to provide updates on our manufacturing transformation and other improvements across the business, but until then, thank you again for your continued dedication and support, and enjoy the summer.

Stay SAFE and Healthy!

— Brad Taylor, President & CEO
Plibrico Company, LLC

Highlights from Q2-2022

NEW HIRES

- David Pinnegar, Northbrook, IL – Safety Manager
- Doyle Willis, Salem, OH – Project Manager
- Brian Welton, Salem, OH – Production Associate, Redi-Shapes
- Diosa Ebreo, Northbrook, IL – Administrative Assistant
- Jay Engelbrecht, Northbrook, IL – Sales Representative
- Cheryl Toalson, Northbrook, IL – Business Development Manager
- Tony Olszewski, Northbrook, IL – Vice President of Sales



Plicast Al-Rezist prevents corundum growth that can destroy a refractory lining

Al-Rezist Refractories Designed for High Performance Aluminum Furnaces



For aluminum processors, one of the costliest operational challenges in high-production environments is the aggressive formation of corundum deposits in furnaces. Excessive, damaging, and costly, corundum growth can be mitigated with the right refractory materials, coupled with proper maintenance.

Plibrico's Plicast Al-Rezist line of low-cement, aluminum resistant refractories are engineered for processors who run aluminum melting and holding furnaces hotter and faster for extended periods of time, and therefore require superior aluminum resistant refractory performance.

"Due to robust demand, processors, foundries and die casters are operating furnaces at or above maximum production rates, leading to a costly operational challenge: preventing corundum growth that will destroy a refractory lining," explained Brad Taylor, President and CEO of the Plibrico Company. "We introduced Plicast Al-Rezist to meet today's need for a more resistant, longer lasting refractory that protects our clients' furnaces from corundum and other destructive forces."

Plicast Al-Rezist is recommended for protection of the furnace hearth, lower

sidewall and belly bands. These areas of metal contact suffer the most mechanical abuse and metal penetration.

The new line is produced with an enhanced multi-component package for exceptional performance against more aggressive alloys, including those with high fluidity. This multi-component system prevents aluminum from wetting the surface of the refractory and growing corundum below the surface line. In fact, in multiple blind tests, Plicast Al-Rezist had an unmeasurable amount of aluminum penetration, while other brands had 0.15" amount of penetration. As a result, repairs and downtime are kept to an absolute minimum. That is one of the reasons it is rated "Excellent" by ALCOA® Refractory Evaluation Parameters.

Developed with installation in mind, Plicast Al-Rezist is simple to apply with flexible options including Cast, Pump, or VibCast. It is also ideal for use in precast shapes since its rheology enables smooth crisp shape lines and corners.

Plibrico's Al-Rezist line of castables offers superior aluminum penetration resistance and refractory performance. Download the PDF information sheet by clicking [Here](#).

Plibrico Department Update

ENGINEERING & TECHNICAL SERVICES

The Engineering Department has been very busy over the last quarter. The R&D department has released the new Al-Rezist line of refractory castables designed for aluminum applications, ranging from a conventional 65% alumina mix to a low cement 80% alumina mix to an advanced ceramic based mix designed for the most extreme service conditions. The Quality department continues to make strives maintaining product quality. Our team continues to develop cost effective solutions to aid our Partners in servicing their customers.

ACCOUNTING, FINANCE, PURCHASING, AND IT

Following Alice McHugh's retirement at the end of the year, Ron Schumann has taken over the purchasing function, and will use his all-around experience that he had with Redline Industries to work with vendors and our Oak Hill production team to enhance our supply chain strategy. Liz Csapo became a mom with the birth of her son, Fitzgerald. She came back on April 4th. Diosa Ebreo has been handling the accounts payable and customer cash application functions, which has allowed Radu Mihestean to handle more operational accounting functions, such as inventory costing, production analysis, and all financial statement related activity. Dave Rimkus continues to enhance our IT infrastructure to thwart intruders. All of us can help by being vigilant with ignoring email attachments from suspicious emails and not entering your login information to fraudulent websites.

Protect Substrates from Molten Metal

Plibrico Protective and Parting Agent Coatings



Today's heat processing operation managers are challenged with the endless pursuit of high productivity. Key to achieving that goal is the ability to reduce maintenance time and unexpected downtime, in addition to increased process efficiency and refractory life. Selecting the correct type of coating and method of application is one proven and economical way managers can move closer to achieving their goal.

Unlike the days of old, today's coatings, both liquid and dry, are complex performance products that are an integral part of any total refractory solution. Selecting and applying the most appropriate coating can increase productivity by reducing the time needed for cleaning or repairing of molds, as well as providing economic benefits by minimizing the amount of lost metal.

When combined with the correct refractories, coatings offer an important tool in reducing labor costs and

improving productivity. These operational benefits ultimately lead to an efficiently produced, high-quality product.

The Plibrico Company offers a wide range of protective and parting agent coatings used in a variety of applications: melting and holding furnaces, hand and automatic ladles, thermocouple protection tubes, sow and ingot molds, troughs, casting tables, and most boards and skim tools, just to name a few.

Our PliKote line of coatings provide:

- Great adhesion to substrates, cutting maintenance costs
- Fast dry times, reducing downtime
- Excellent application and covering power, minimizing runs and teardrops, as well as blistering, cracking, or scaling on drying
- Good suspension, remix, and storage stability properties
- Superior protection against metal penetration, lowering cleaning costs

Most refractory successes involve an effective coatings solution. High-temperature, energy-efficient ceramic coatings for refractories can help to reduce maintenance and unscheduled downtime, increase production, and improve temperature uniformity, all while enhancing product quality.

In all operating conditions, the Plibrico Company specializes in refractory design, installation, repair, and replacement of aluminum melting and holding furnaces, steel reheat furnaces, boilers, incinerators, and industrial furnaces as well as many other applications.

Our knowledge and experience supporting thousands of customers' refractory needs, provides you with a seasoned partner that can support you with reliably durable refractory solutions that will enhance your operational equipment throughout your facility. Download the PDF information sheet by clicking [Here](#).

Getting to know you: Tony Olszewski

Where do you work? "I travel, and work from my home office."

Where do you live? "Buffalo, New York"

What do you do in your free time? "I really enjoy hiking with my daughter, mountain biking, and playing golf with my wife."

What do you like about your job? "The diversity of the job. I like being involved in all the different aspects of the business, from sales and marketing, to operations and customer service. I enjoy helping define the long term strategy of the business and the freedom to be entrepreneurial in my decision making."



OAK HILL MANUFACTURING ADDS STATE-OF-THE-ART DUAL BAGGING SYSTEM TO INCREASE THROUGHPUT

Plibrico's Oak Hill, Ohio manufacturing plant is doubling its throughput thanks to the addition of a new bagging system.

The new dual pneumatic bagger has replaced Plibrico's single auger bagger system. The Oak Hill crew is excited about the additional capabilities the new system brings to the operation. It utilizes a self-contained blower and a patented reverse flow hopper design to provide accurate bag filling at high speeds. The increase in operational throughput will help Plibrico to become even more flexible and responsive to customer quick turn requirements.



PLIBRICO IN THE NEWS

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

RECENT NEWS

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

[Read on](#)

Plibrico Announces Tony Olszewski as its New Vice President of Sales

[Read on](#)

Plibrico Aids Aluminum Processors with New Plicast Al-Rezist High-Performance Refractory

[Read on](#)

The Safety Spot: Ten Tips for Confined Spaces

Reducing risk is critical when working inside storage tanks, boilers, furnaces, vaults, tunnels, or other confined spaces. Trench collapses, atmospheric hazards, and falls account for half of all fatalities, and serve as a reminder of how important safety precautions and training are when inside and around confined spaces.

1. Identify the existence, location, and dangers posed by each confined space, and monitor these spaces for engulfment dangers and hazardous atmospheres.

2. Test the air in confined spaces for oxygen levels, flammable and toxic substances, and stratified atmospheres before workers enter the space.

3. If the air is not safe for workers, install blowers, fans or other mechanical ventilation so that employees can work without hazard.

4. Install blowers, fans or other mechanical ventilation if the air is not safe so workers

can complete tasks without hazard.

5. Remove any liquids or free-flowing solids from confined spaces to eliminate the risk of drowning or suffocation.

6. Authorized entrants must wear a chest or full body harness with a retrieval line attached to the center of their backs.

7. Assign an attendant to remain outside the confined space to monitor the entry operation and to help during an emergency.

8. Lockout all potentially hazardous energy sources such as electrical, mechanical, hydraulic, pneumatic, chemical, or thermal prior to entry to the confined space.

9. Coordinate activities on multiemployer worksites so that hazards are not introduced into a confined space by workers outside the space.

10. Only personnel that have received training in rescue procedures may enter a confined space to perform a rescue.



Plibrico Profiled in Thermal Processing Magazine



Thermal Processing magazine featured the Plibrico Company in the Company Profile section of their publication. Brad Taylor, Plibrico's president and CEO, was interviewed for the article. He explained how Plibrico Company built a business over more than a century, based on trust, knowledge, and experience — qualities that create close, lasting relationships.

Click to [view](#)

Case Study: Refractory in Waste-to-Energy Boilers Replaced with Safer, Higher Performance Plibrico 90-S



The Great River Energy Recovery Station (ERS) Engineering Group identified an opportunity to improve the safety of the working environment at its Waste to Energy (WTE) plant in Elk River, Minnesota by replacing Emerald Ram chromium-based refractory in three boilers with Plibrico 90-S. Plibrico met the challenge at a lower price while delivering higher performance and safety characteristics.

Due to the frequency and high cost of maintenance needed to repair the existing refractory used to protect three WTE boilers in its facility from high temperature thermal stress, erosion, and corrosion, ERS conducted a study on how to best remedy the situation. It opted that the best course of action was to replace the existing refractory, which was a recognized health and environmental hazard when heated, with a new one.

TESTING CRITERIA

ERS engineers began their research to identify an alternative by using the following criteria:

- 1.) The alternative must hold up as well as the Emerald Ram over time in the WTE boilers.
- 2.) The alternative would as cost effective in terms of the materials.
- 3.) The alternative would be as cost effective in labor and time required.

- 4.) The alternative would be readily available and easy to procure.
- 5.) The alternative would be classified as a non-hazardous material with no known risks of producing carcinogenic compounds and be safe for landfills.

RESEARCH FINDINGS

After extensive testing and validation studies, ERS found that Plibrico 90-S meet all required criteria:

- 1.) Held up as well or better than Emerald Ram over a 12-month testing period in three fully operating boilers. Testing showed that large sections of of the Emerald Ram refractory in one of the boilers failed to the point where it need major repairs, while the Plibrico 90-S did not.
- 2.) The cost per 55lb bag was actually \$25 less for the Plibrico 90-S than the Emerald Ram.
- 3.) There was no noticeable difference in labor costs during installation, and that the dry-out period for the Plibrico 90-S was an improvement when done using localized drying.
- 4.) Plibrico had experience in WTE refractories and the WTE market, provided needed technical and R&D support, and had a local presence in the Midwest to supply ERS with materials when needed without delay.
- 5.) Plibrico 90-S is a non-hazardous product with no carcinogenic compounds and is landfill-safe.

During testing, ERS discovered that in one of the three boilers the Emerald Ram refractory around feed chutes and the lower front header severely cracked across the whole refractory resulting in total failure, whereas the Plibrico 90-S only showed small sections where cracking was evident despite being subjected to identical conditions. The cracks did not spread and might have been the result of an improper dry out by the contractor.

After conducting its research, ERS selected and successfully installed Plibrico 90-S refractory in all three WTE boilers. The end result is the total elimination of hazardous material in the work environment, and establishing proof that non-chromium based refractory materials are a viable option in challenging WTE applications. ERS is continuing to look at ways to make the installation process as consistent as possible in each of its boilers to improve the way the boilers are operated and maintained.

LEARN MORE

Plibrico 90-S is a very high alumina, phosphate bond plastic refractory with a service limit of 3400°F. In addition to WTE, it is recommended for steel and foundry furnaces, sulfur recovery units, burner cones, utility boilers and other high temperature applications. Learn more online by clicking [Here](#).



1935 Techny Road-Unit 16, Northbrook, IL 60062
312.337.9000 | contact@plibrico.com
www.plibrico.com

© 2022 Plibrico Company, LLC
All rights reserved.