



Plibrico®

Refractories | Service | Engineering

Plibrico Refractory Solutions for Aluminum Processors

Highly Durable Solutions with Quality Results

QUALITY

DURABILITY

EXPERIENCE



Every day we design highly durable refractory solutions for aluminum companies that safely improve productivity, temperature control, and service longevity, which enables them to create quality products more efficiently for their valued customers.

We are the trusted partner of many industrial companies operating critical thermal processing environments. We help them, and we can help you keep your thermal operations up and running.

YOUR CHALLENGES. OUR EXPERIENCE.

WHAT KEEPS YOU UP AT NIGHT?

Your goal is to create quality aluminum products safely, efficiently, and economically for your valued customers. Our goal is to help you do just that.

At Plibrico we understand that well-maintained processing equipment and a quality team are critical to sustaining high up-times. When one falters, it places your company's success in jeopardy.

When you most need help, Plibrico's refractory solution experts extend a hand and are ready to help with urgency. Whether you are a current client or considering becoming a new one, sunup to sundown to sunup, we can be on-the-ground quickly to install or repair refractories so that you can safely resume production and minimize downtime.

Plibrico's concept-to-completion services and resources allow for fast turnaround on refractory materials and repairs to bring your heating processes back online swiftly.



WHAT MAKES PLIBRICO DIFFERENT?

THAT'S SIMPLE – IT'S OUR TEAM.

It's the things we do day in and day out that create lasting relationships with our customers and make us their preferred refractory supplier.

Powered by knowledgeable experts with genuine experience, Plibrico's innovative refractory solutions are backed by more than 100 years of experience and success. Our true single source solutions, from material manufacturing through installation and repairs, including engineering, gives us a unique understanding of what works best in a variety of challenging environments. Plibrico's customer-focused team of unstoppable specialists have on-the-job, in-depth expertise, passion, and success. And it's because of the special relationships we have with our customers who depend on us that they truly love what they do.

Whether you have an unexpected emergency repair or a new installation, or if you just need advice, Plibrico's team of knowledgeable refractory experts can help with the right refractory solution for you.



AT PLIBRICO
CARE IS AT OUR CORE



Every Plibrico refractory solution is backed by knowledgeable application engineers who have decades of specialized experience in many key industries, giving us a deep understanding of what will work best for your operation. Our clients enjoy these benefits:

- Refractory solutions centered around your needs
- Skilled project management and experienced crews
- Dedicated personnel ready to respond and help, 24/7

EMERGENCY SERVICES

Sunup to sundown to sunup, when you most need help, Plibrico's refractory solution experts extend a hand and are ready to help with urgency. We can be on-the-ground quickly to install or repair refractories so you can safely resume production and minimize downtime.

REFRACTORY SERVICES

A high-quality refractory installation contributes significantly to lining performance, while effective maintenance ensures a long life.

Plibrico offers a turnkey scalable solution for companies needing refractory repair, design and initial build, demolition, and related services. Our knowledgeable team helps clients every step of the way to ensure the solution matches their specific needs and that the construction is properly managed from conception through completion.

ENGINEERING SERVICES

Our in-house engineering team has in-depth experience designing safe, high-quality solutions for small to large-scale production needs. They know the ins and outs of which refractory materials best suit individual applications, environments, and uses, and they are well versed in dry-out requirements and specificities. We provide clients detailed refractory solution recommendations and guidance, plans and CAD installation drawings, and heat-loss calculations. Our thorough, detailed approach ensures safety in the final product with efficient spend and time throughout the design and installation process.

PLIBRICO REFRACTORY SERVICES AT A GLANCE

Refractory Services

Maintenance
Turnarounds
Shutdowns and Outages – Small and Large
New Construction
Complete Rebuilds
Major Repairs
Demolition and Tear Out
Emergency Services
Hot Patch Repairs

Engineering Services

Design and Drawings
Anchor Pattern and Plan
Material Take-Off Plan
Heat Loss Calculations and Recommendations

Installation and Repair Services

Castable Forming, Pouring and Pumping
Plastic Ramming
Shotcrete and Gunnite
Ceramic Fiber
Injectable Hot Spot
Refractory Brick

Project Management

Concept to Completion

Shop Fabrication

Refractory Heat Up Services

Bake-Out / Dry Out Services Refractory

Inspection and Analysis

APPLICATIONS

PRIMARY AND SECONDARY ALUMINUM REFRACTORY SOLUTIONS

Today's aluminum processors demand not only service and value, they also expect durability and top performance. The Plibrico Company enables companies operating critical heat environments to create quality products for their valued customers efficiently, safely, and economically.

We have the expertise and knowledge to service a wide variety of aluminum processing equipment, from 240,000-lb-capacity melting and holding furnaces down to 1,000-lb-capacity die casting and crucible furnaces.

MELTING FURNACES

Maintaining a clean environment free from impurities conserves metal integrity. It also maximizes thermal efficiency and reduces corundum growth. Plibrico engineers have developed a high-quality, complete line of refractories for every zone in a furnace. From high loads to thermal shock, alkali resistance to thermal efficiency, each product is designed to meet and exceed the different zone requirements. Plibrico refractory engineers can design and deliver a full refractory solution, concept through completion.

HOLDING FURNACES

Economically preserving an optimal melt temperature while maintaining metal integrity and thermal performance can be a challenge. Plibrico rises to meet the challenge with efficient products and solutions that are insulating, semi-insulating, lightweight, and non-wetting, which can lead to a better refractory lining performance. Solutions are designed to resist the harsh conditions and different wear mechanisms found with the different zones of the holding furnace.

REHEAT FURNACES

Reducing micro-segregation to enhance the strength of the aluminum through proper stress relieving is critical for homogenizing furnace systems. Plibrico uses a wide range of solutions to help achieve the required tight-temperature control and uniformity. Solutions can include ceramic fiber, which is an efficient and economical insulator, big block precast shapes that can increase your up time, coarse grain refractory material that provides additional resistance against high-temperature impact abuse, and phos-bonded products that stick to existing refractory and offer an accelerated dry-out reducing your down time.

DIE CASTING / ALUMINUM FOUNDRY FURNACES

Producing dependable high-quality cast products for a variety of industries relies upon high-quality refractory solutions. Developing economical refractory linings that protect furnace temperature efficiency and uphold metal integrity is our goal. Plibrico's refractory experts provide solutions for tough applications.

CRUCIBLE FURNACES

Durability, reliability, and efficiency are key to creating quality aluminum products. Plibrico Redi-Shapes, our precast shapes solution, provides economical high-thermal efficiency with the much-needed thermal shock protection. Plibrico operates an integrated supply chain, ensuring your refractory solutions are always top-performing.



**DURABLE IN THE MOST
SEVERE CONDITIONS**

**PLIBRICO HIGH-QUALITY
NON-WETTING REFRACTORIES**

ZONE SOLUTIONS

For aluminum processors to create quality products for their valued customers efficiently, safely, and economically, they need refractory solutions that are highly durable with unparalleled support.

Our refractory engineers will work alongside you to analyze and recommend the best refractory solution for your unique challenge, from concept through completion. You can trust Plibrico's knowledgeable experts with genuine experience, as many aluminum processors do, to provide you with the finest refractory installation and maintenance services.

1 RAMPS/SILL

Only refractories that exhibit high hot strength and abrasion resistance, such as Plibrico's Al-Shield and Al-Tuff series, will withstand the corrosion and mechanical abuse seen in this section of a furnace.

PRODUCTS

Plicast Al-Tuff 3100 Special
Plicast Al-Shield 2765
Plicast Al-Tuff 65C
Plicast Al-Tuff 80C
Plicast Al-Shield 3223 C

5 LOWER WALL/BELLYBAND

Undeniably the most demanding refractory zone inside an aluminum furnace. Plibrico has engineered refractories that successfully address the most severe conditions such as high thermal loads, shock, and corundum growth.

PRODUCTS

Plibrico 85 S Special
Plicast Al-Shield GHC 8
Plicast Al-Tuff 3100 Special
Plicast Al-Tuff 80 C
Pli-Shot Al-Shield GHC 7
Exo Set UNO A
Si-Bond M AL

2 JAMB/LINTEL

The highest wear, impact, and abrasion within an aluminum furnace can be found in this zone. Also found in this zone are some of the toughest materials Plibrico has engineered.

PRODUCTS

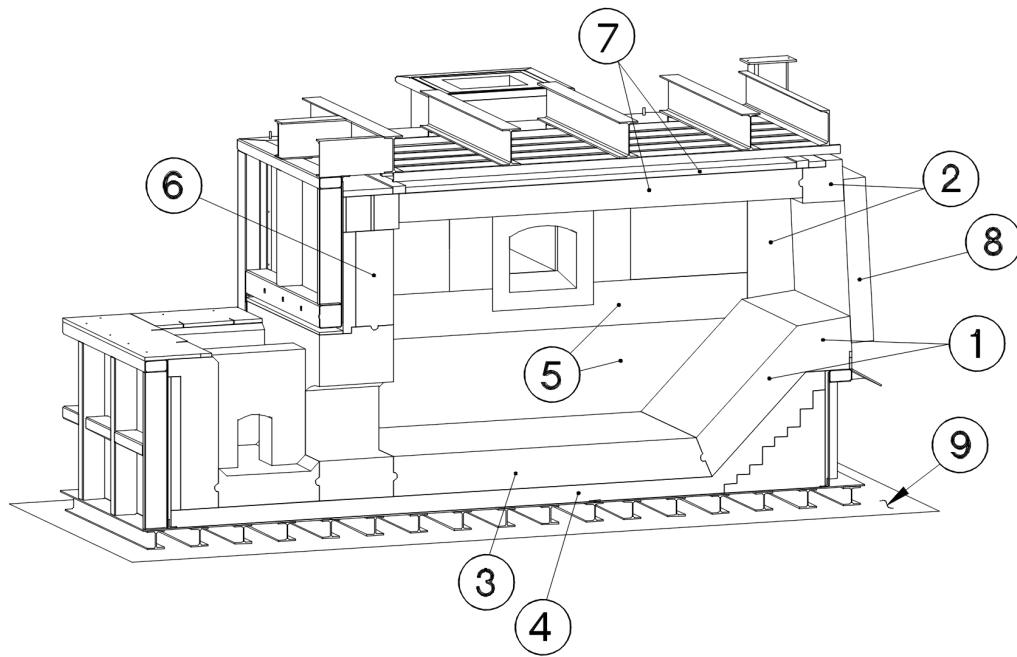
Plicast HyMOR 3100 Special
Plicast HyMOR 65C
Plicast HyMOR 70
Plicast HyMOR 80 C
Plicast Ad-MOR 6

6 UPPER WALLS

Balance is the key to addressing the alkali abuse that upper walls experience. Plibrico's engineered refractories have a great balance of structural integrity, thermal properties, and the ability to resist corundum growth.

PRODUCTS

Plibrico 60 AB
Plibrico 85 S Special
Plicast Fast Track 65-31
Plicast HyMOR 70
Plicast HyMOR 3000
Plicast HyMOR 3100 Special
Pli-Shot HyMOR 3100 Special



3 HEARTH

A vital area in any furnace, an aluminum hearth can experience high loads and a battery of wear mechanisms, from cleaning tools that scrape to large sows that create impact. Plibrico products are dually designed to have high hot strength and resistance to aluminum penetration.

PRODUCTS

Plicast Al-Tuff 3100 Special
 Plicast Al-Shield 2765
 Plicast Al-Tuff 65C
 Plicast Al-Tuff 80C
 Exo Set UNO A

7 ROOF

Within the aluminum furnace, the roof will experience a variety of gas volatiles that are ever present in the chamber. Plibrico's refractories are engineered to withstand these volatiles while offering high thermal loads and good mechanical strength.

PRODUCTS

Plicast HyMOR 3100 Special
 Plicast HyMOR APS 55
 Plicast HyMOR 3000
 Plicast HyMOR 3100
 Plicast Fast Track 65-31
 Plicast LWI 20
 Plicast Airlite

4 SUB-HEARTH/BACK UP

Plibrico provides products with great insulating value. Superior products with favorable thermal properties and densities to help yield excellent thermal conductivity.

PRODUCTS

Plicast Al-Tuff 27 C
 Plicast Al-Tuff LWI 24
 Plicast Al-Tuff C/G 25

8 DOOR

Built for durability, Plibrico LWI technology delivers products that balance the need for lightweight and fantastic thermal properties.

PRODUCTS

Plicast LWI 28
 Plicast LWI 30

9 FURNACE PAD

No cracking or spalling, Plibrico products are engineered to withstand splash damage, high forklift loads, and cleanout tubs.

PRODUCTS

Plicast Floorguard
 Plicast Floorguard HT
 Plicast Al-Tuff Floorguard HT

PRODUCTS

Designed to reduce your downtime, Plibrico monolithic refractory lines are engineered to withstand the harsh thermal environment seen in aluminum furnaces and transfer equipment, including troughs, launders, and ladles.

The first in the industry to introduce a complete line of non-wetting aluminum contact castable refractories, Plibrico refractories are field tested and durable.

Plibrico has spent more than 100 years perfecting precise, quality refractories that deliver the necessary safety and reliability. We offer a full suite of non-wetting products for the aluminum industry.

AL-SHIELD PRODUCTS

Engineered specifically for your high-temperature aggressive aluminum alloys and contact areas, Plibrico offers Al-Shield castable refractories and gun mixes. Al-Shield refractories contain aluminum-resistant additives that create a barrier between the aluminum and refractory lining providing zero penetration. The additive compound reacts with aluminum to form a dense barrier layer. Our Al-Shield refractories provide a longer service life that results in less downtime.

EXO-SET UNO PRODUCTS

Chemically bonded to make them tough and corrosion-resistant, Plibrico's Exo-Set UNO products have an accelerated dry-out schedule to get you up and running more quickly. Suitable for metal contact and all other areas in an aluminum furnace, these phosphate-bonded products are available as castables, gun mixes, and plastic materials. Plibrico's Exo-Set UNO series are single-component, "just add water" phosphate-bonded mixes for quick, easy, and safe installation.

ALUMINUM SERVICE MIXES

These robust phosphate-bonded, high alumina mixes deliver the benefit of excellent corrosion resistance and adhesion to existing refractory. These dual advantages keep your refractory repairs and downtime to a minimum. These maintenance go-to mixes are extremely versatile, non-wetting, and can be used for patch applications all the way through veneering.

AL-TUFF PRODUCTS

An economical workhorse engineered for the aluminum industry, our Al-Tuff family of non-wetting refractory materials was designed specifically to provide you with an effective, non-wetting solution for aluminum applications. The Al-Tuff series features products that are modified with a non-wetting additive that resists aluminum wetting in contact areas. The modified surface increases wetting resistance and reduces the potential for oxidation reduction.

PHOSPHATE BONDED PLASTICS

Pliphos, a proprietary monoaluminium phosphoric acid blend, is used in all of Plibrico's phos-bonded plastics. This special blend improves and lengthens the service life of your refractory lining. These plastics are low in impurities, iron, alkalis and offer stable storage characteristics. Our line of phos-bonded plastics provides a superior bond to existing refractory and resists aluminum penetration at very high temperatures. Its durable characteristics make this line of plastics a problem solver and a maintenance favorite.

FLOOR GUARD PRODUCTS

Designed to be crack and spall-free after many thermal cycles, these durable, high-temperature-rated Floor Guard products can handle the stress and heat. Fantastic compressive strength, great alkali resistance, and excellent thermal resistance extend the zone life in front of your furnace. Fast and easy to install, Floor Guard products are made for aluminum furnaces and are available non-wetting.

TECHNICAL DATA

Product Name	Max Temperature (service/contract)	Al ₂ O ₃ %	SiO ₂ %	Density (pcf)
Exo-Set UNO A	2500°	85.4	2.7	172
Plibrico 60 AB	3100°	57.6	38.5	154 / 140
Plibrico 85 S Special	3300°	83.3	11.1	180 / 165
Plicast Airlite	1800°	12.2	40.6	35
Plicast Al-Shield 2765	2800°F / 2000°F	56.6	25.3	162
Plicast Al-Shield 3223 C	2700°F / 2000°F	61.7	19.8	170
Plicast Al-Shield GHC 8	3000°F	77.7	10.1	170
Pli-Shot Al-Shield GHC 7	3000°F / 1800°F	70.1	18.1	160
Plicast Al-Tuff 27 C	2500°F / 1700°F	44.6	35.5	130
Plicast Al-Tuff 65 C	3100°F / 1700°F	64.5	29.8	158
Plicast Al-Tuff 80 C	3100°F / 1700°F	80.9	12.1	170
Plicast Al-Tuff 3100 Special	3100°F / 1800°F	60.3	34.3	152
Plicast Al-Tuff C/G 25	2500°F / 1500°F	40.6	45.9	118
Plicast Al-Tuff Floor Guard HT	2500°F / 1700°F	43.2	40.4	135
Plicast Al-Tuff LWI 24	2450°F	42.0	42.6	80
Plicast Ad-MOR 6	3100°F	62.5	34.9	160
Plicast Fast Track 65-31	3100°F	63.6	32.2	152
Plicast Floor Guard	2450°F	32.0	47.6	128
Plicast Floor Guard HT	2500°F	43.2	40.4	135
Plicast HyMOR 65 C	3100°F	66.7	29.1	155
Plicast HyMOR 70	3100°F	70.7	24.1	156
Plicast HyMOR 80 C	3100°F	81.1	12.8	168
Plicast HyMOR 3000	3000°F	48.8	45.4	139
Plicast HyMOR 3100	3100°F	77.9	17.3	170
Plicast HyMOR 3100 Special	3100°F	61.5	34.3	152
Plicast HyMOR APS 55	3050°F	56.6	38.4	145
Pli-Shot HyMOR 3100 Special	3100°F	59.3	35.6	149
Plicast LWI 20	2000°F	41.8	29.9	58
Plicast LWI 28	2800°F	54.1	36.9	85
Plicast LWI 30	3000°F	52.3	40.8	95
Si-Bond M AL	2800°F / 2000°F	55.8	32.9	150

PLIBRICO REDI-SHAPES

Proven Solutions to Ensure the Longest Service Life

CUSTOM CRAFTED, PRECISION FORMED

Made from the highest-quality refractory materials, Plibrico Redi-Shapes provide fast refractory lining replacement in recurring high-wear zones. Our in-plant manufacturing conditions enhance consistent production, and molds are engineered to ensure a perfectly contoured, dimensionally accurate block every time.

- **Top Quality:** Stringent quality control with hand inspections before and after firing to ensure your critical surfaces are defect free with a perfectly contoured shape
- **Customized Engineering:** Solutions and drawings that address your requirements and challenges to improve your total cost of ownership
- **Installation and On-Site Technical Support:** Experience and advice for problem areas that increase refractory strength, durability, and longevity

From lintels and troughs to roofs and domes, the Plibrico Company has decades of experience producing the quality precast shapes you need.

MEETING QUICK TURN DEMANDS

Plibrico's in-depth expertise and decades of experience in precast shape manufacturing ensure perfectly contoured, dimensionally accurate blocks molded from the company's high-quality castable and plastic refractory materials to withstand the most demanding thermal conditions.

Custom firing optimizes shape properties for specific application challenges, such as abrasion, erosion, thermal shock, or metal and slag penetration. And because they are custom made to precise sizes, Redi-Shapes eliminate the need to tear out major positions of the refractory lining adjacent to the damaged zone.



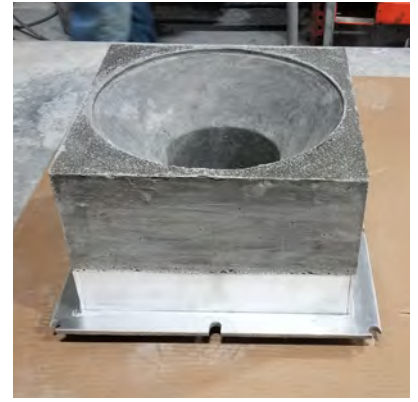
Manufactured, Cured, and Dried Out in Controlled Conditions to Optimize Refractory Properties and Service Performance



Troughs and Launderers



Doors



Burner Blocks



Sills and Lintels



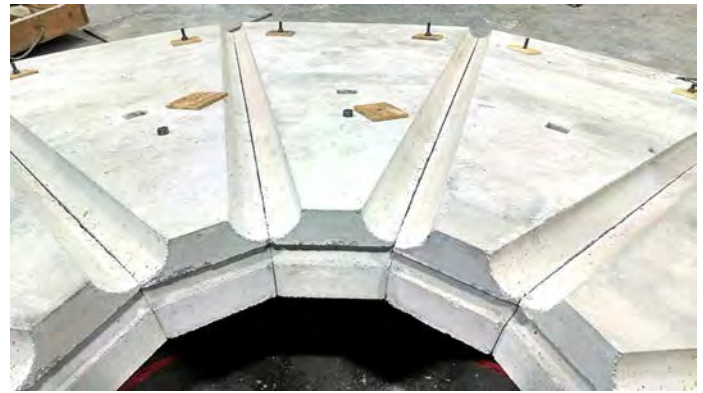
Big Blocks



Door Jambs



Melter/Holder Roofs



Domed Roofs



THE PLIBRICO DIFFERENCE.

“Don’t work with anyone else, this is some of the best refractory work and material we have seen.”

~ Aluminum Processing Client

Over the years, refractory technology has developed from a simple idea into a complex, ever-evolving solution. Plibrico provides advanced, proven technologies and unparalleled service to aluminum processors. Every order is backed by application specialists who form close partnerships with clients.

KNOWLEDGEABLE

Plibrico’s innovative refractory solutions are backed by more than 100 years of experience and success. Our true single source solutions, from material manufacturing through installation and repairs, including engineering, gives us a unique understanding of what works best in a variety of challenging environments.

Many of us have stood in your shoes. We have worked in the aluminum processing plants and have personally relied on the refractory technologies Plibrico provides. We have smelted aluminum, completed die casts, and started the furnaces. We have managed floors and watched over workers to ensure quality products and employee safety. We know the care that goes into your day and the importance of relying on quality refractories to execute success.

QUICK RESPONSE

When you most need help, our experts are ready to help with urgency. Whether you are a current client or considering becoming a new one, we can be on-the-ground quickly to install or repair refractories so you can safely resume production and minimize downtime.

Plibrico’s concept-to-completion services and resources allow for fast turnaround on refractory materials and repairs to bring heating processes back on line swiftly.

QUALITY AND SPEED, FROM CONCEPT THROUGH COMPLETION

Clients have a single point of contact for all of their questions and to help guide their solution from concept through completion, and beyond. Our expert team will provide the information you need while ensuring material delivery and installation are on time, every time.

CONSISTENCY AND RELIABILITY

We pride ourselves on consistent, high-quality materials and service, delivered on time and within budget.

Our research facilities and teams work tirelessly to ensure that our refractories will stand the test of time and heat to provide premier solutions. You’ll benefit from thoroughly tested and time-backed refractories.

AROUND THE CORNER

Plibrico is a US-based organization that works with a network of national and international refractory experts to provide quality refractory services and solutions around the globe.

Our Northbrook, Illinois, headquarters house the research and development department, quality control and testing laboratory, and refractory engineering specialists. All refractory materials are housed and manufactured in Oak Hill, Ohio, to allow fast turnaround of quality refractory products.



QUALITY SOLUTIONS WITH UNPARALLELED SUPPORT

We house problem solvers, go-to managers, superintendents, supervisors, field crews, lab technicians and developers, and everyone in between. Our customer-focused team has in-depth knowledge of and field experience in both aluminum furnace refractory services and materials.

We use that knowledge to ensure your solution matches your specific need and is properly managed from conception through completion.

Discover Plibrico – We have built a business over more than a century based on trust, knowledge, and experience, qualities that create close, lasting relationships with our customers and allow us to deliver superior refractory heat control solutions to you.

For more information about how Plibrico can support your aluminum furnace needs, contact us today at 312-337-9000 or contact@plibrico.com.



Plibrico Refractory Solutions for Aluminum Processors

Let Our Quality and Experience Support Your Success

Our team works tirelessly to deliver superior refractory heat control solutions to you when you need them most, for precisely your need. Plibrico's single source concept-to-completion services allow for fast turnaround on refractory materials and repairs to bring your heating processes back online swiftly.

Our genuine experience provides you with a reliable partner you can trust. Get to know us! Contact us today for more information about how Plibrico can support your aluminum furnace needs.

Plibrico Refractory Solutions

REFRATORIES | SERVICE | ENGINEERING



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