



**Plibrico®**

**Refractories | Service | Engineering**

# **Plibrico Refractory Solutions for Steel Processors**

**Highly Durable Solutions with Quality Results**



# QUALITY

# DURABILITY

# EXPERIENCE

Every day we design highly durable refractory solutions for steel 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 steel 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 development and 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, a new installation, or 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 concept 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 which refractory materials best suit individual applications, environments, and uses, and they are well versed in dry-out requirements. The team plays a key role in providing clients detailed refractory solutions that include material guidance, design plans, 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 Selection and Pattern Design  
Material Selection and Take-Off  
Heat Loss Calculations and Recommendations

### Installation and Repair Services

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

### Project Management

Concept to Completion

### Shop Fabrication

### Refractory Heat Up Services

### Bake-Out / Dry Out Services

### Refractory Inspection and Analysis



# APPLICATIONS

## STEEL INDUCTION AND REHEAT FURNACE REFRACTORY SOLUTIONS

Today's steel 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 steel processing equipment, from 200,000-lb-capacity induction furnaces down to 500-lb-capacity roller hearth furnaces.

### WALKING BEAM/HEARTH FURNACE

Extremely efficient for processing large, heavy, or various structural steel parts in a semi-continuous mode, these furnaces can pose a challenge when trying to maintain a uniform temperature. Plibrico uses a wide range of solutions to help achieve the required tight-temperature control and uniformity that is needed to realize important fuel savings. Solutions can include ceramic fiber, which is an efficient and economical insulator; 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 adhere to existing refractory and offer an accelerated dry-out that reduces your down time.

### CONTINUOUS PUSHER FURNACE

The tight control of temperature and atmosphere necessary for processes with long residence times that require exact control can be a challenge. Plibrico engineers have developed a high-quality, complete line of refractories for every zone in a furnace. From carburizing to nitriding, preheating, washing, tempering and cooling, 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.

### BATCH FURNACE

From the large Car Bottom to the economical Box Furnace, producing superior steel products for an assortment 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 a variety of tough applications.

### ROTARY FURNACE

Economically preserving an optimal forge 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 and lightweight, 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 furnace zones.

### ROLLER HEARTH FURNACE

Durability, reliability, and efficiency are key to creating quality steel products. Plibrico Redi-Shapes®, our precast shapes solution, provides economical high-thermal efficiency with the much-needed thermal shock protection. Roller hearth furnaces can be used to treat a very wide range of products accurately and economically. Plibrico operates an integrated supply chain, raw material through finished product, ensuring your refractory solutions are always top-performing.





**DURABLE IN THE MOST  
SEVERE CONDITIONS**

**PLIBRICO HIGH-QUALITY REFRACTORIES**



# ZONE SOLUTIONS

For steel 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 steel processors do, to provide you with the finest refractory installation and maintenance services.

## 1. SIDEWALLS: PREHEAT ZONE

### PRODUCTS

Plibrico Super F AB  
Pli-Shot HyMOR 3000  
Plibrico 60 AB  
Plicast HyMOR 3100 Special

## 2. ROOF: PREHEAT ZONE

### PRODUCTS

Plicast HyMOR 3000  
Plicast KL 3000 P  
Plicast HyMOR APS 55  
Plicast HyMOR 3100 Special  
Plibrico Super F AB

## 3. SIDEWALLS: HEAT/SOAK ZONE

### PRODUCTS

Plibrico 60 AB  
Pli-Shot HyMOR 3100 Special  
Plibrico 80 AB  
Pli-Shot HyMOR 3100  
Plicast HyMOR 70

## 4. ROOF: HEAT/SOAK ZONE

### PRODUCTS

Plicast HyMOR APS 55  
Plicast HyMOR 3100 Special  
Plicast HyMOR 70  
Plicast HyMOR 3100  
Plibrico 60 AB

## 5. BURNER WALLS

### PRODUCTS

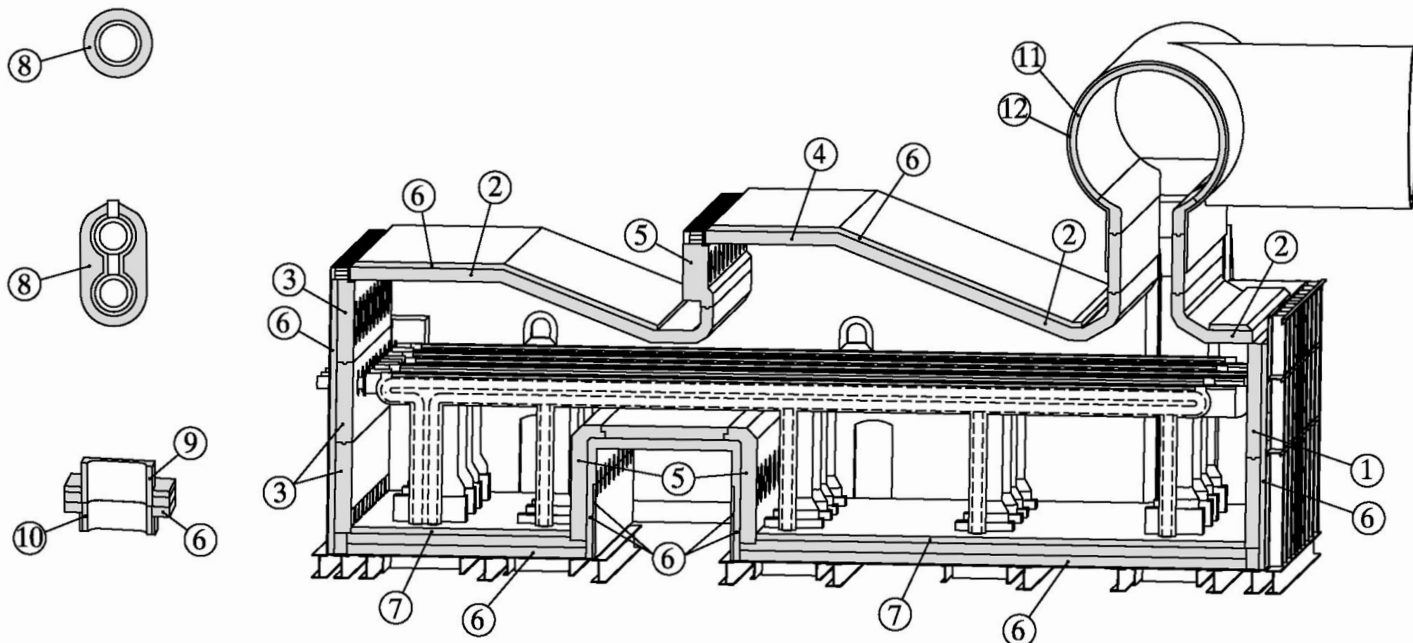
Plibrico 80 AB  
Plibrico 85 S Special  
Pli-Shot HyMOR 3100  
Plibrico 68-S  
Plicast AdMOR 6

## 6. INSULATION

### PRODUCTS

Plisulate 1900°F Block Insulation  
Pligun LWI 106  
Pligun LWI 24  
Plicast LWI 20  
Plicast Airlite 25





## 7. HEARTH: WALKING BEAM

### PRODUCTS

Plicast HyMOR 3000  
Plicast KL 3000  
Plicast HyMOR 3100 Special  
Plicast HyMOR 70  
Plicast HyMOR 3100

## 8. HEARTH: WALKING HEARTH

### PRODUCTS

Plicast HyMOR 3100 Special  
Plicast HyMOR 65 C  
Plicast Super HyMOR 80  
Plicast HyMOR 80 C  
Plicast Si-Bond B  
Plicast HyMOR 70

## 9. SKID PIPE COVERING

### PRODUCTS

Plicast HyMOR 3000  
Plicast HyMOR 3100 Special  
Plicast HyMOR 70

## 10. POST BASE INSULATION

### PRODUCTS

Plisulate 1900°F Block Insulation  
Pligun LWI 106  
Pligun LWI 24  
Plicast LWI 20

## 11. STACK

### PRODUCTS

Pligun LWI 106  
Pligun Tuff Mix

## 12. STACK INSULATION

### PRODUCTS

Plisulate 1900°F Block Insulation  
Pligun LWI 24

# PRODUCTS

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

The first in the industry to introduce a complete line of plastic and low cement 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 refractory products for the steel industry.

## HYMOR PRODUCTS

Engineered specifically for your high-temperature steel alloys and contact areas, Plibrico offers advanced castables that offer a perfect combination of very high strengths, high abrasion resistance, and excellent thermal shock resistance. These tough low cement castables are bonded by a high purity matrix CAC: 3-8% CAC (LC) and 0.5-3% CAC (ULC), and deliver abrasion resistance that can withstand severe alkali attack. Versatile installation options, HyMOR products can be cast, pumped and even delivered as precast shapes. All possess excellent strength throughout temperature ranges as well as very good abrasion and erosion resistance.

## LWI PRODUCTS

An essential section of any multi-component lining configuration, Plibrico lightweight insulating castables are ideal as back-up linings behind hot face linings to reduce shell temperatures. Our lightweight are engineered for the perfect balance of high porosity, low bulk density and low thermal conductivity. All our LWI refractories provide excellent physical and thermal properties, equating to outstanding reliability.

## CONVENTIONAL CASTABLE PRODUCTS

An economical workhorse engineered for the steel industry, our conventional castable materials were designed specifically to provide you with an effective, solution for steel applications. Highly effective for general applications that demand thermal efficiency. Versatile, combination of aggregates and binders for all application. Flexible and easy to install produces rugged monolithic linings with good volume stability. Refractory castables are provided in a wide range of properties to fit your desired application and processes.

## PLASTIC REFRACTORIES

Tried-and-true this go-to material exhibits excellent resistance to thermal shock from rapid heating or cooling furnace conditions. Our plastic refractories offer high refractoriness and volume stability under high temperature conditions.

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. Our line of plastics provides a superior bond to existing refractory and can handle very high temperatures. Its durable characteristics make this line of plastics a problem solver and a maintenance favorite.

## STEEL GUARD PRODUCTS

These are a great combination of proprietary blended material and expert manufacturing. Our high alumina, precast block for dry skid applications in steel reheat furnace hearths provides an even wear pattern and resistance to slag build up.

## FAST TRACK PRODUCTS

Engineered to cut dry-out time in half, Fast Track technology enables these refractories to be heated without the traditional ramp-and-hold heatup schedule, offering a perfect balance between great refractory properties and rapid dry-out. This delicate and critical balance allows for minimization of production downtime without sacrificing refractory durability. User-friendly and easy to cast, this product provides great gunning properties with low rebound. Designed to develop strength quickly, go from installation to operation in as little as 20 hours.



# TECHNICAL DATA

Product Name	Max Temperature (service)	Al <sub>2</sub> O <sub>3</sub> %	SiO <sub>2</sub> %	Density (pcf )
Plibrico Super F AB	2500° F	85.4	2.7	172
Plibrico 60 AB	3100° F	57.6	38.5	140
Plibrico 68-S	3100° F	67.8	26.9	152
Plibrico 80 AB	3200° F	78.1	17.6	157
Plibrico 85 S Special	3300° F	83.3	11.1	165
Plicast AdMOR 6	3100° F	62.5	34.9	160
Plicast Airlite 25	2500° F	33.5	37.0	25
Plicast HyMOR APS 55	3050° F	56.6	38.4	145
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 KL 3000-P KK	3000° F	52.6	40.1	123
Plicast LWI 20	2000° F	41.8	29.9	58
Plicast Si-Bond B	3200° F	78.2	18.1	172
Plicast Super HyMOR 80 KK	3100° F	77.6	18.8	168
Pligun LWI 24	2450° F	42.2	43.8	85
Pligun LWI 106	2000° F	30.6	49.1	40
Pligun Tuff Mix	2500° F	45.7	42.1	120
Pli-Shot HyMOR 3000	3000° F	49.3	44.9	136
Pli-Shot HyMOR 3100	3100° F	74.1	20.4	164
Pli-Shot HyMOR 3100 Special	3100° F	59.3	35.6	149
Plisulate 1900 Block Insulation	1050° F	20%	48%	17-19 lb/ft <sup>3</sup>

# 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 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

Plibrico offers high firing capabilities up to 2000°F.

From delta sections and hearth shapes to burner blocks and ladle covers, 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



Delta Sections



Hearth Shapes and Sidewall Block



Burner Blocks



Sills and Lintels



Dry Skid Blocks



Door Jamb



Hearth Pier Blocks



Reheat Furnace Stack Damper



Walking Hearth



Roll Tile



Walking Hearth

# THE PLIBRICO DIFFERENCE.

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

~ *Steel Reheat Furnace 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 steel 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 steel processing plants and have personally relied on the refractory technologies Plibrico provides. We have galvanized steel, forged metal, and operated the furnaces. We have managed production operations 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 our ceramic and mechanical engineering group. Refractory materials are housed and manufactured in our main Oak Hill, Ohio, location 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 steel 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 steel furnace needs, contact us today at 312-337-9000 or [contact@plibrico.com](mailto:contact@plibrico.com).







## Plibrico Refractory Solutions for Steel 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 steel furnace needs.

**Plibrico Refractory Solutions**   
REFRACTORIES | SERVICE | ENGINEERING



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