



Patel Nagar

Refractories Private Limited

ENGINEERED FOR PERFORMANCE.
CALCINED WITH PRECISION.

📍 FROM

BIRBHUM TO BHARAT

- Delivering Engineered Mineral Reliability



Patel Nagar Refractories Pvt. Ltd. (PRPL) is a certified manufacturer of refractory-grade calcined kaolin clay and calcined pyrophyllite, with its headquarters and licensed manufacturing facility strategically located in **Patel Nagar, Birbhum, West Bengal.**

ABOUT US

2012

Production facilities commissioned and operations commenced

2023

Trusted supplier to leading refractory & cement manufacturers across India.

Foundation laid through incorporation

2017

Expanded production capacity & automation.

TODAY



LEADERSHIP

A preeminent and revered figure in India's natural resources sector, **Mr. Swapan Kanti Ghosh brings to the table over 45 years of unparalleled and rich expertise and leadership in the Kaolin (China) Clay mining industry.** As the Managing Director of both Patel Nagar Minerals and Industries Private Limited and Patel Nagar Refractories Private Limited, he has been fundamental and instrumental in shaping the trajectory of the China clay business in East India, establishing himself as one of the industry's most influential, prominent and respected leaders. His strategic vision and foresight has driven significant business growth, modernization and development of mining operations and expanding market penetration across the region.

CORE VALUES

PRPL focuses on the typical issues in the refractories sector include fluctuating raw material standards, delayed deliveries, and fragmented sourcing and addresses these market gaps with:

QUALITY FIRST

Engineered for thermal stability and durability.



COMPLIANCE ALWAYS

Fully registered, trademark-protected, and factory-licensed operations.



SUSTAINABILITY

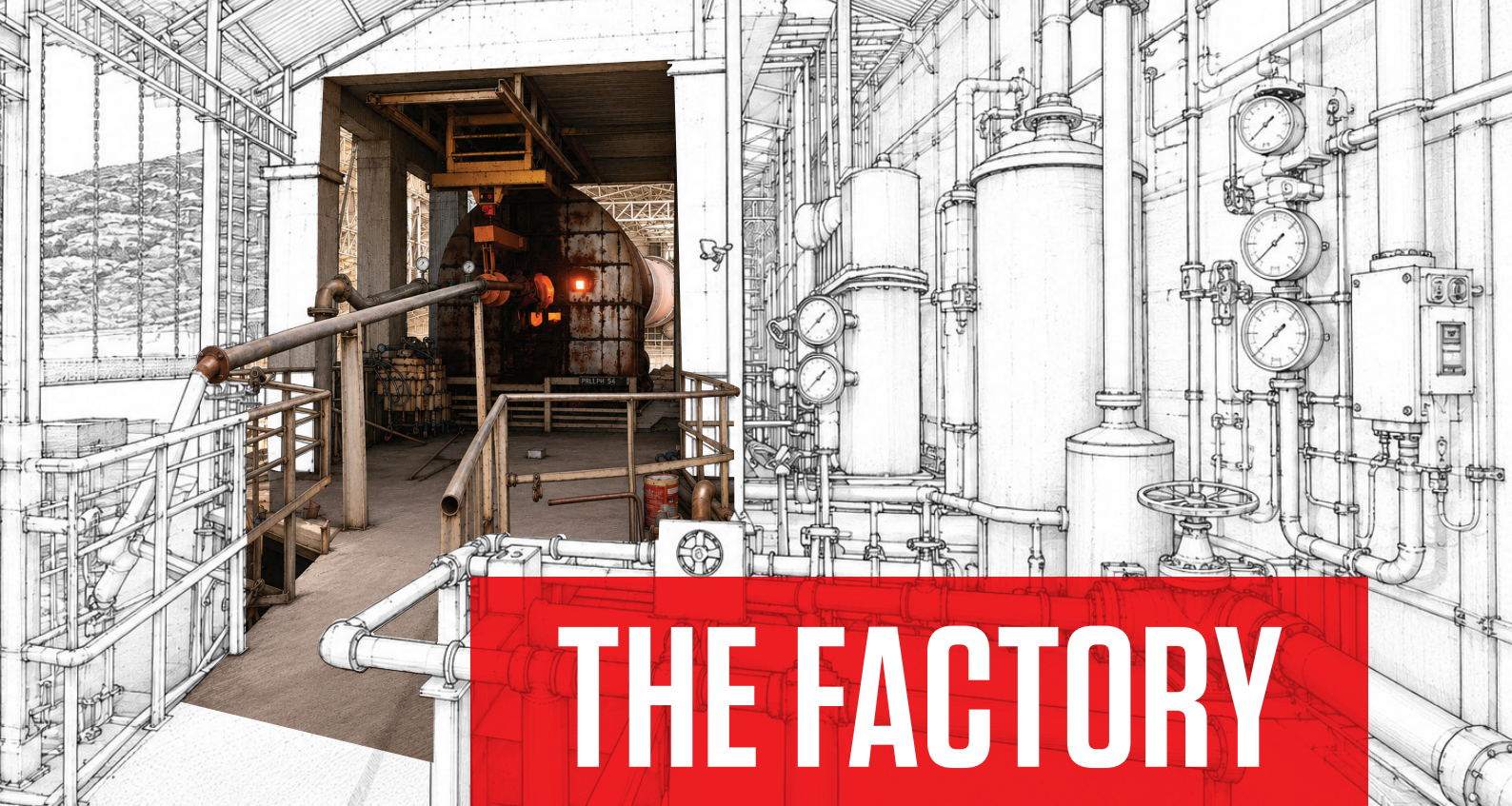
Responsible production with minimized environmental footprint.



CUSTOMER COMMITMENT

Transparent communication and dependable supply.





THE FACTORY

PERFORMANCE ADVANTAGES OF KAOLIN CLAY



LOW APPARENT POROSITY

ENHANCES THERMAL RESISTANCE AND REDUCES HEAT PENETRATION.

Rotary Kiln Calcined Kaolin Clay is engineered with optimized apparent porosity to balance strength and insulation performance.

Lower open pore volume :

- ⊕ Reduces heat penetration
- ⊕ Enhances thermal resistance
- ⊕ Limits crack propagation
- ⊕ Improves compressive strength in cement systems



LOW ALKALI CONTENT

PREVENTS HARMFUL REACTIONS IN CEMENT SYSTEMS.

The naturally low calcium oxide and alkali oxide content of Rotary Kiln Calcined Kaolin Clay minimizes harmful internal reactions.

This directly :

- ⊕ Reduces the risk of Alkali-Silica Reaction (ASR) in concrete
- ⊕ Prevents chemical corrosion in refractory linings
- ⊕ Improves long-term structural integrity
- ⊕ Supports sustainable clinker replacement in cement



HIGH BULK DENSITY

IMPROVES MECHANICAL STRENGTH AND STRUCTURAL RELIABILITY.

With a bulk density of $\geq 2.42 \text{ g/cm}^3$, our material enables :

- ⊕ Superior particle packing
- ⊕ Higher load-bearing capacity
- ⊕ Reduced shrinkage and permeability
- ⊕ Improved dimensional stability



HIGH REFRACTORINESS (PCE 32-34)

ENSURES SUPERIOR THERMAL STABILITY.

The consistent PCE rating reflects :

- ⊕ Stable mullite formation during calcination
- ⊕ High alumina-silica balance
- ⊕ Resistance to thermal deformation
- ⊕ Predictable high-temperature behavior

Premium Rotary Kiln Calcined Kaolin Clay engineered for thermal stability, structural strength, and long-term industrial reliability.

Manufactured through controlled high-temperature rotary kiln calcination, our material is purpose-built for superior performance in refractory bricks and refractory grade cement applications – where failure is not an option.



PERFORMANCE ADVANTAGES OF PYROPHYLLITE



HIGH REFRACTORINESS

MAINTAINS PERFORMANCE UNDER EXTREME TEMPERATURES

The mullite-rich mineralogy of Calcined Pyrophyllite provides excellent thermal stability and refractory performance in high-temperature applications.

This directly:

- ⊕ Maintains structural integrity at elevated temperatures.
- ⊕ Resists thermal deformation and softening.
- ⊕ Supports reliable refractory performance under continuous heat exposure.
- ⊕ Extends service life in demanding thermal environments.



THERMAL SHOCK RESISTANCE

RESISTS CRACKING DURING THERMAL CYCLING

The mullite-rich microstructure helps accommodate thermal stresses generated during rapid heating and cooling cycles.

This directly :

- ⊕ Reduces crack initiation and propagation.
- ⊕ Minimizes spalling during temperature fluctuations.
- ⊕ Improves reliability during repeated heat-up and shutdown cycles.
- ⊕ Enhances refractory lining life under cyclic operating conditions.



SUPERIOR DIMENSIONAL STABILITY

MAINTAINS SHAPE AT ELEVATED TEMPERATURES

The calcination process produces a stable mullite-bearing structure with reduced firing shrinkage and improved dimensional control.

This directly:

- ⊕ Minimizes warpage and distortion during service.
- ⊕ Improves shape retention at high temperatures.
- ⊕ Ensures consistent dimensional accuracy.
- ⊕ Supports stable long-term refractory performance.



LOW APPARENT POROSITY

REDUCES PENETRATION AND DEGRADATION

The dense fired structure with Apparent Porosity $\leq 2.0\%$ limits open pathways for the ingress of aggressive materials.

This directly:

- ⊕ Restricts heat penetration.
- ⊕ Resist thermal shock damage
- ⊕ Improves hot-face surface integrity.
- ⊕ Enhances durability in demanding service.



The physicochemical characteristics of calcined china clay (calcined kaolin) refers to its chemical composition and physical properties after kaolin has been heated (typically 1400–1450°C or higher) to remove chemically bound water and alter its crystal structure.

CHEMICAL COMPOSITION

Typical composition (% by weight):

COMPONENT	SiO ₂ (Silica)	Al ₂ O ₃ (Alumina)	Fe ₂ O ₃ (Iron oxide)	TiO ₂ (Titanium dioxide)	CaO (Calcium oxide)	MgO (Magnesium oxide)	Loss on Ignition (LOI)
TYPICAL RANGE (%)	45-55	40-42	1.8-2.2	2.4-2.6	0.1-0.5	0.1-0.5	0.1 (max)

The exact composition depends on the source deposit and calcination temperature.

PHYSICAL PROPERTIES

Typical properties of calcined kaolin:

PROPERTY	Color	Apparent Porosity	Bulk Density	Moisture Content
TYPICAL VALUE	Gray to Black	5.0% - 6.5%	2.42 g/cm ³	<1%

PHYSICOCHEMICAL CHARACTERISTICS

Calcination imparts several important characteristics:

- 🔴 Reduced plasticity compared with raw kaolin.
- 🔴 Increased hardness and abrasiveness.
- 🔴 Higher surface activity.
- 🔴 Enhanced pozzolanic reactivity (especially for metakaolin).
- 🔴 Lower loss on ignition due to removal of structural hydroxyl groups.
- 🔴 Improved electrical insulation properties.



PYROPHYLLITE

Calcined pyrophyllite is a thermally treated form of pyrophyllite, a hydrous aluminum silicate mineral. Calcination removes structural hydroxyl groups and alters the mineral's crystal structure, improving its thermal stability and other industrial properties.

CHEMICAL COMPOSITION

After calcination, the material is primarily composed of silica & alumina. Typical oxide composition is:

COMPONENT	SiO ₂ (Silica)	Fe ₂ O ₃ (Iron oxide)	Al ₂ O ₃ (Alumina)	TiO ₂ (Titanium dioxide)	Loss on Ignition (LOI)
TYPICAL RANGE (%)	50-55	0.8-1.2	39-41	1.0(max)	0.1(max)

The exact composition varies depending on the ore deposit and beneficiation process.

PHYSICAL PROPERTIES

Typical properties of Calcined Pyrophyllite:

PROPERTY	Color	Apparent Porosity	Bulk Density	Moisture Content
TYPICAL VALUE	White to light off-white	2.0% (max)	2.55 to 2.60 g/cm ³	<1%

PHYSICOCHEMICAL CHARACTERISTICS

Calcination produces several important changes:

- ◆ Increased thermal stability.
- ◆ Reduced shrinkage during firing.
- ◆ Improved refractoriness.
- ◆ Lower volatile content (reduced LOI).
- ◆ Increased hardness and dimensional stability.
- ◆ Improved compatibility with ceramic and refractory systems



PRODUCTS

LUMPS (MOQ: 25 MT)



CALCINED CLAY LUMPS
(0-50MM)



High-volume
(loose bulk)



Truckloads
(25 - 35 MT)

**CALCINED
PYROPHYLLITE
LUMPS
(0-50MM)**



High-volume
(loose bulk)



Truckloads
(25 - 35 MT)

LUMPS (MOQ: 25 MT)



PRODUCTS

GRADES (MOQ: 25 MT)

CALCINED CLAY GRADES



0-1 MM (GRADED)



1-3 MM (GRADED)



3-5 MM (GRADED)

PACKING OPTIONS :



Technically skilled, experienced,
certified workforce



Jumbo Bags
(800kg)



Responsive communication and
customized solutions for each client

CALCINED PYROPHYLLITE GRADES



0-1 MM (GRADED)



1-3 MM (GRADED)



3-5 MM (GRADED)

PACKING OPTIONS:



Technically skilled, experienced, certified workforce

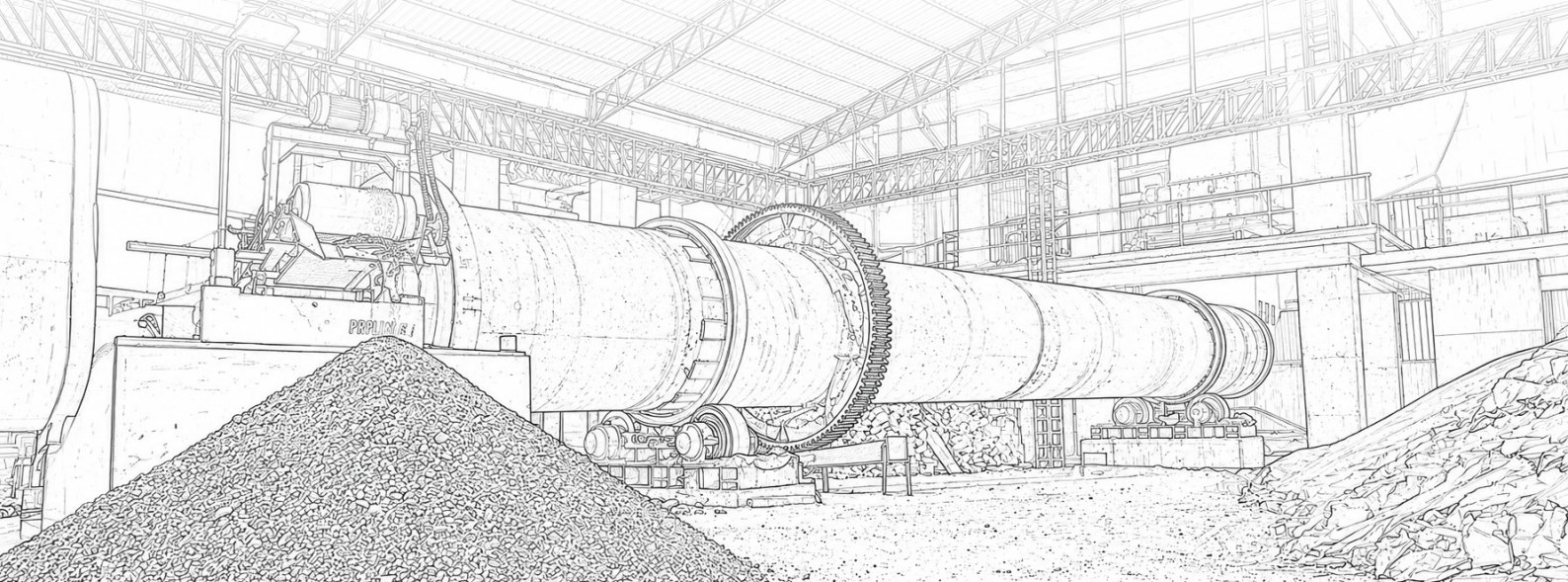


Jumbo Bags (800kg)



Responsive communication and customized solutions for each client

GRADES (MOQ: 25 MT)





PRODUCTS

FINES (MOQ: 25 MT)



CALCINED CLAY FINES (170 MESH)



PACKING OPTIONS:



Technically skilled, experienced, certified workforce



Jumbo Bags (800kg)



Responsive communication and customized solutions for each client



CALCINED PYROPHYLLITE FINES (170 MESH)



PACKING OPTIONS :



Technically skilled, experienced,
certified workforce



Jumbo Bags
(800kg)



Responsive communication and
customized solutions for each client

FINES (MOQ: 25 MT)



ADDITIONAL VENTURES



BRIHASPAT REFRACTORY

A supplier of refractory-grade calcined kaolin and calcined pyrophyllite, available in standard graded sizes of 0–1 mm, 1–3 mm, and 3–5 mm, along with fine powder material up to 170 mesh.



SAVITUR REFRACTORY

A supplier of refractory-grade calcined kaolin and calcined pyrophyllite, available in standard graded sizes of 0–1 mm, 1–3 mm, and 3–5 mm, suitable for a wide range of refractory applications.



ARUN UDYOG

A manufacturer of crushed stone aggregates, supplying stone chips in various standard sizes for construction and infrastructure projects.



BANSHIDHAR CHEMICALS

A manufacturer of agrochemical products, offering 2,4-D Sodium Salt, 2,4-D Amine Salt and 2,4-D Acid, alongside Hexachlorobenzene (HCB), an industrial-grade chemical.



SOVA MINERALS INDUSTRIES

A supplier of kaolin clay in lump and powder forms, available in different mesh specifications to serve diverse industrial requirements.



PATELNAGAR MINERALS & INDUSTRIES (P) LTD.

A manufacturer and supplier of kaolin clay, offering the material in both lump form and powder form across various mesh sizes for industrial applications.



OUR CLIENTS



CONTACT US



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ACCOUNTS

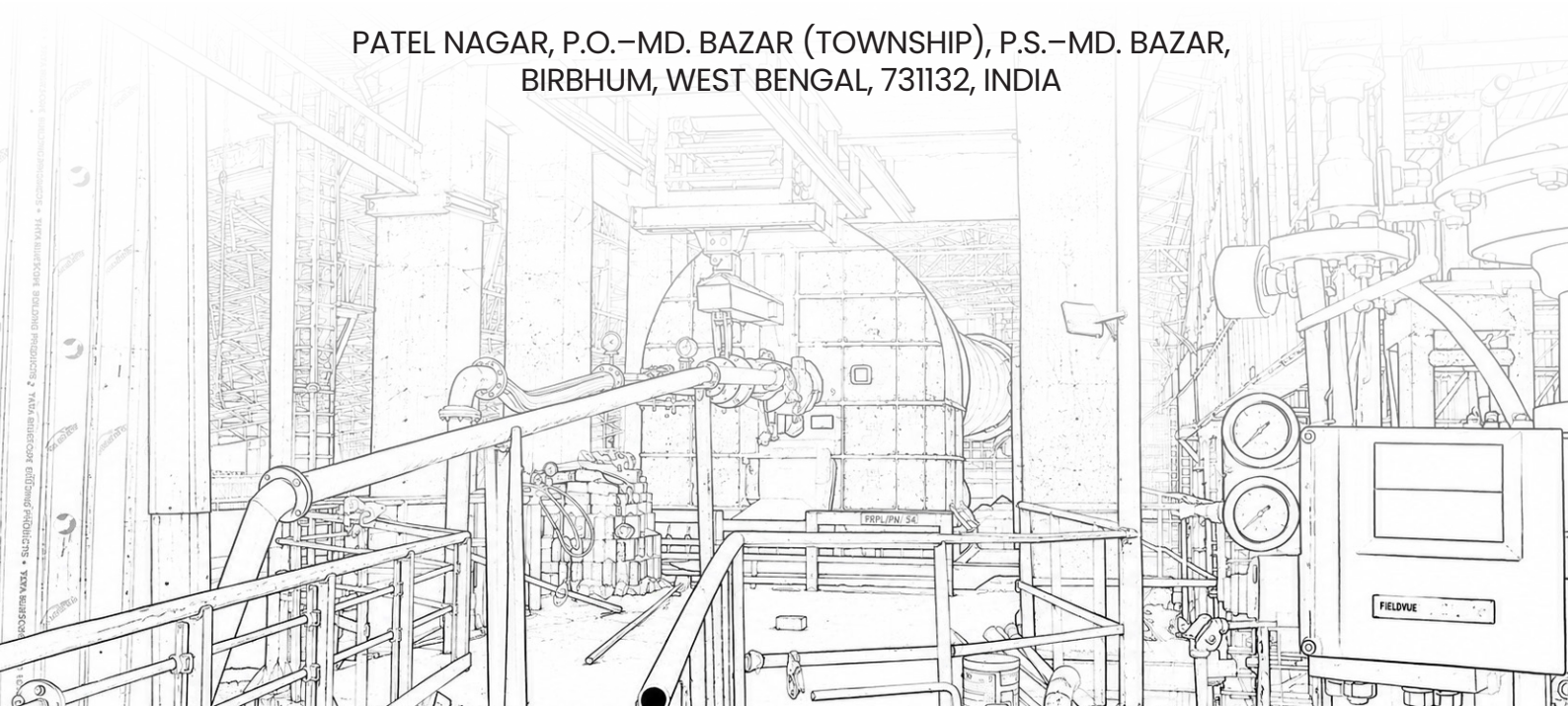
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