

AUSTRALIA

BASIC BRICK SOLUTIONS FOR ROTARY KILNS

Cement Industry



Calderys now manufactures premium magnesia-spinel basic bricks locally in Odisha, India - bringing world-class HWI technology to your doorstep with the speed, support, and other advantages of local supply.

PROTECTING THE HEART OF YOUR KILN

The rotary kiln is the most critical and cost-intensive asset in a cement plant. The basic brick lining - covering the burning zone, upper and lower transition zones - faces relentless attack from every direction simultaneously.

THE CHALLENGES

Thermal stress

- Peak temperatures exceeding 1,450 °C in the burning zone.
- Rapid temperature fluctuations during start-up, shutdown and fuel changes.
- Increasing use of alternative fuels creates unpredictable thermal spikes.

Mechanical load

- Tyre and shell ovality generate cyclic mechanical stress on every rotation.
- Creep and brick displacement during kiln operation.
- Kiln shell flexing under varying process loads.

Chemical attack

- Aggressive alkali salts (K_2SO_4 , Na_2SO_4) penetrate brick pores, causing densification and cracking.
- Clinker melt infiltration and redox cycling degrade the matrix.
- Sulfate and chloride attack accelerated by alternative fuel combustion.

Hydration risk for bricks

- Humidity during storage can increase hydration before use.
- Traditional shelf-life limitations pose inventories management challenge in India.
- Undetected hydration compromise lining integrity, resulting in unexpected shutdowns and costly emergency relining.

Every additional month of campaign life gained means considerable saving in refractory costs, avoided downtime, and improved kiln availability. The right brick choice - and the right supplier partnership - is a strategic business decision.

OUR SOLUTION: THE NEW BASIC BRICK RANGE

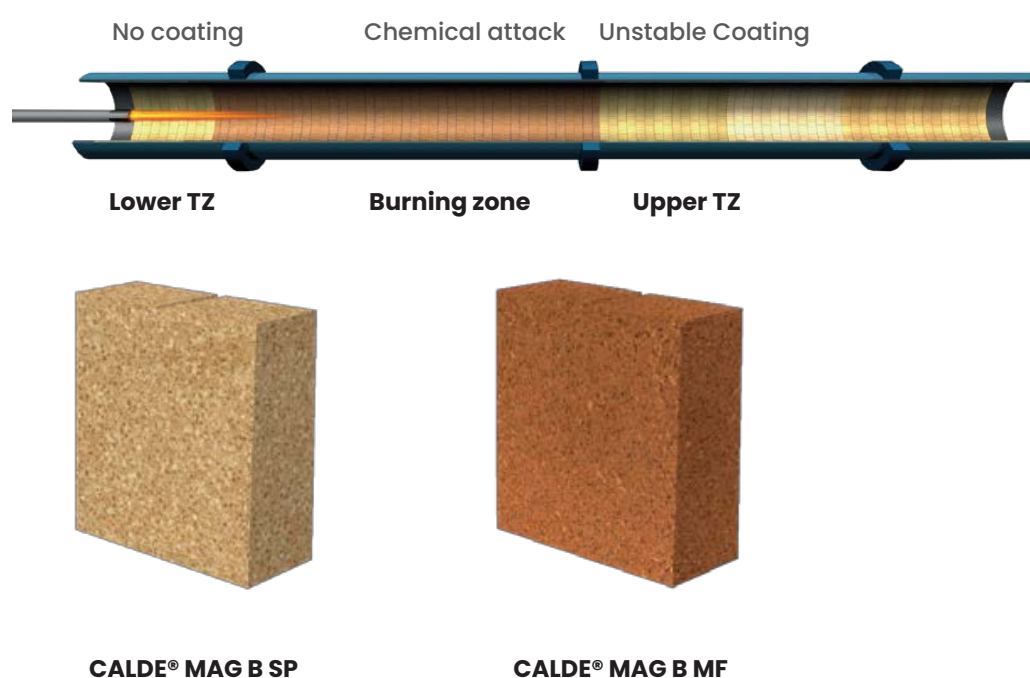
Calderys has developed a comprehensive range of magnesia-spinel basic bricks specifically engineered for the demanding conditions of modern cement rotary kilns in India and Southeast Asia. These bricks are manufactured at our state-of-the-art facility in Odisha, India, embedding proven HWI technology into locally produced products.

Zone-by-zone coverage

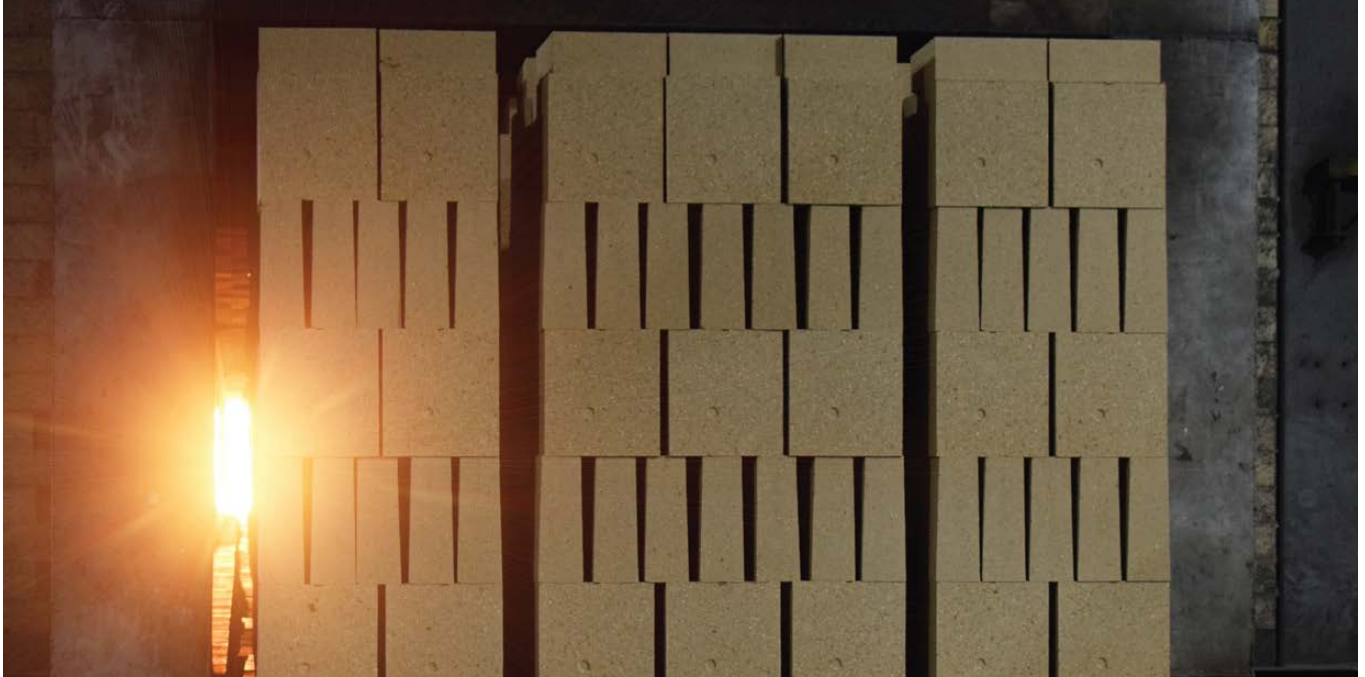
The basic bricks range produced in our new facility in Odisha, India (also known as CAPES) provides optimised solutions for every critical zone of the rotary kiln:

Application Areas	Recommended CALDE® Bricks
Upper and Lower transition zone	CALDE® MAG B SP Series
Burning zone	CALDE® MAG B MF Series

Connect with Calderys experts for selection of the right quality, based on your process parameters.



WHAT SETS CAPES BASIC BRICKS APART



HWI expertise, now available in India

Calderys now manufactures basic bricks at its Odisha plant using the technology and formulation expertise of HarbisonWalker International now HWI, a member of Calderys. HWI is the Group's brand in the Americas and one of the world's most respected refractory specialists backed by 160 years of expertise and innovation. As a result, customers can now benefit from HWI's proven refractory know-how through locally manufactured products, while enjoying the logistics, responsiveness and supply advantages of domestic production.

India-first advantages

- Manufactured at the Calderys plant in Odisha (CAPES) with a dedicated production line for basic bricks.
- Significantly shorter lead times vs. imported bricks — critical for emergency relining situations.
- Lower total landed cost: no import duties, reduced freight, no port delays.
- Local technical support and on-site engineering from Calderys India specialists.

Global technology expertise

- Drawing on HWI's extensive expertise in magnesia refractory formulations, trusted in cement kilns worldwide.
- Incorporates best quality synthetic spinel, fine-tuned for Indian clinker chemistry and kiln operating profiles.
- Backed by HWI's Advanced Technology & Research Center (ATRC) for continuous product development.
- ISO 9001 certified manufacturing.

Dedicated state-of-the-art basic brick production line

At the new Calderys plant in Odisha, basic bricks will be produced with world-class equipment, including:

- In-house crushing and grinding facility for raw material preparation — ensuring consistent grain size distribution and purity control at every batch.
- High-capacity hydraulic pressing for uniform bulk density and low porosity.
- High-temperature tunnel kilns delivering precise firing profiles.
- Dedicated quality lab with full chemical and physical property testing: XRF, CCS, apparent porosity, RUL, thermal shock cycles.
- Controlled storage and dispatch area with seaworthy packaging capability.
- End-to-end traceability from raw material to shipped pallet.





HC SERIES: SPECIALIZED REFRACTORIES FOR HEAVY COATING & SPURRITE RING CONTROL

Engineered for the most challenging upper transition zone conditions

In the upper transition zone (UTZ), severe thermal fluctuations, aggressive alkali-sulfur chemistry, unstable coating behavior, and persistent spurrite ring formation can rapidly compromise refractory performance and kiln stability.

HC Series is purpose-engineered to meet these challenges.

SOLUTION FOR EXCESSIVE RING FORMATION CHALLENGE

Optimised for heavy coating zones

Specialised microstructure and chemistry that helps to reduce coating build ups at upper transition zone - supporting lining protection and improved working volume under demanding process conditions.

Enhance resistance to spurrite ring conditions

Optimised low-porosity microstructure with low open pores than regular grades - limiting alkali-sulfur penetration and improving durability in heavy coating zones.

Extended service confidence

Robust performance under aggressive UTZ conditions - supporting longer campaign life and fewer refractory-related disruptions.

Developed for heavy coating environments and spurrite-prone operating conditions, HC Series delivers a carefully balanced refractory solution that supports coating management, chemical resistance, and prolonged lining reliability in critical kiln zones.

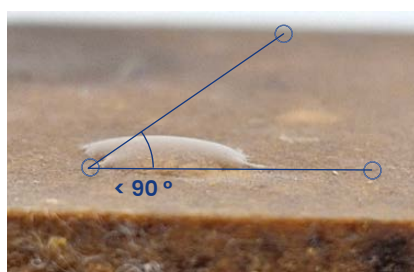
HR SERIES: HYDRATION RESISTANT REFRACTORIES

Engineered to resist moisture. Build to protect beyond your kiln.

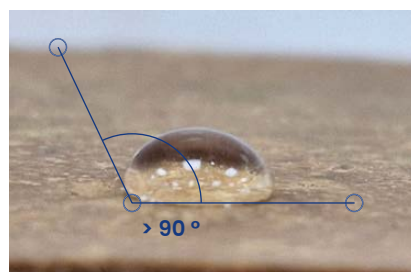
In cement plants, refractory reliability begins long before kiln start-up. Exposure to humidity, rain, and prolonged storage can lead to hydration damage, surface deterioration, and installation risk in conventional basic bricks.

HR Series introduces a new standard in refractory protection.

Developed with advanced Hydration Resistant Surface Technology, HR Series bricks feature a **water-repellent surface barrier** designed to actively resist moisture interaction and protect refractory integrity throughout storage, logistics, handling, and installation.



Standard brick: $< 90^\circ$
contact angle - water absorbed



HR Series: $> 90^\circ$
contact angle - water repelled



A higher contact angle means greater hydrophobicity.
Above 90° = water-repellent surface. Below 90° = moisture ingress begins.

CONFIDENCE THAT LASTS – UP TO 24 MONTHS STORAGE STABILITY

Extended inventory cycles no longer need to compromise refractory quality.

HR Series can be stored for up to 24 months under recommended storage conditions, delivering superior protection against hydration-related deterioration and providing greater operational flexibility for cement producers.

SUPERIOR PERFORMANCE

~99%
reduce
water absorption

Rigorous in-house testing.
The engineered hydrophobic surface significantly suppresses moisture ingress.

PRESERVE REFRACTORY INTEGRITY DURING PROLONGED STORAGE & CHALLENGING AMBIENT CONDITIONS.

BENEFITS FOR YOUR CEMENT PLANT



Longer campaign life

Premium raw materials, optimised spinel content and HWI-derived formulations deliver extended lining life — reducing the frequency and cost of kiln relining. Our bricks have demonstrated up to 24 months of service life in transition zones under severe thermochemical conditions.



Reduced total cost of ownership

Local manufacturing eliminates import duties, reduces sea freight costs and shortens delivery lead times. Combined with lower rejection rates due to hydration protection, the total cost per tonne of clinker produced is measurably improved.



Operational reliability

Consistent quality from a certified production line means predictable kiln performance. In-house quality testing ensures every shipment meets specification — no surprises at installation.



Supply chain security

Domestic manufacturing with inventory held in India means Calderys can respond to emergency orders and urgent relining needs that imported products simply cannot match. Our just-in-time delivery model supports your maintenance planning.



Technical partnership

Calderys provides on-site kiln survey support, refractory design and zoning recommendations, and post-mortem analysis of used bricks — helping you optimise future lining designs based on your specific kiln operating data.



Environmental compliance

All new basic brick grades combine high-performance refractory technology with a more sustainable approach. Their enhanced hydration resistance further reduces material losses, helping lower disposal volumes and environmental impact.

TECHNICAL DATA

NEW BASIC BRICKS RANGE

The following technical data reflects typical values for the CAPES Basic Brick grades. All products are manufactured in accordance with Calderys' ISO 9001 certified quality management system. Specific values for your kiln application and brick format can be confirmed upon enquiry.

Chemical analysis & physical properties

Properties	Testing standard	CALDE® MAG B SP1	CALDE® MAG B SP4	CALDE® MAG B MF2	CALDE® MAG B MF4
AP (%)	ASTM C 20	16.2	15.2	15.8	15.8
BD (gm/cc)	ASTM C 20	2.9	3.0	3.0	3.0
CCS (kg/cm ²)	ASTM C 133	610	630	660	640
RUL (°C)	ISO 1893	1700	1700	1650	1650
Al ₂ O ₃ (%)	IS 12107 Part 3	10.40	11.70	4.4	9.00
Fe ₂ O ₃ (%)	IS 12107 Part 6	0.50	0.40	4.1	2.60
CaO (%)	ASTM C 573	1.3	0.90	1.40	0.90
MgO (%)	ASTM C 573	85.70	86.40	88.90	86.90
SiO ₂ (%)	IS 12107 Part 2	0.60	0.30	0.70	0.30
Thermal expansion at 500 °C (%)	IS 1528 Part 19	0.5	0.5	0.5	0.5
Thermal expansion at 1,200 °C (%)	IS 1528 Part 19	1.2	1.2	1.2	1.2

*Disclaimer: All values are typical production averages and cannot be used as specification limits. Contact Calderys for project-specific data sheets.



WHY CALDERYS FOR YOUR KILN

One trusted partner

From preheater tower to cooler, Calderys provides the complete refractory lining system—monolithics, basic bricks, shaped refractories and installation support—under one accountable contract.

Local production with global expertise

Indian manufacturing capability backed by the global R&D resources of Calderys and HWI. Your kiln benefits from more than 160 years of refractory innovation delivered locally.

Service & support

Dedicated kiln audit programme, on-site installation supervision, post-mortem analysis and 24/7 emergency support. We stay with you for the full campaign life, not just the supply order.

Proven track record

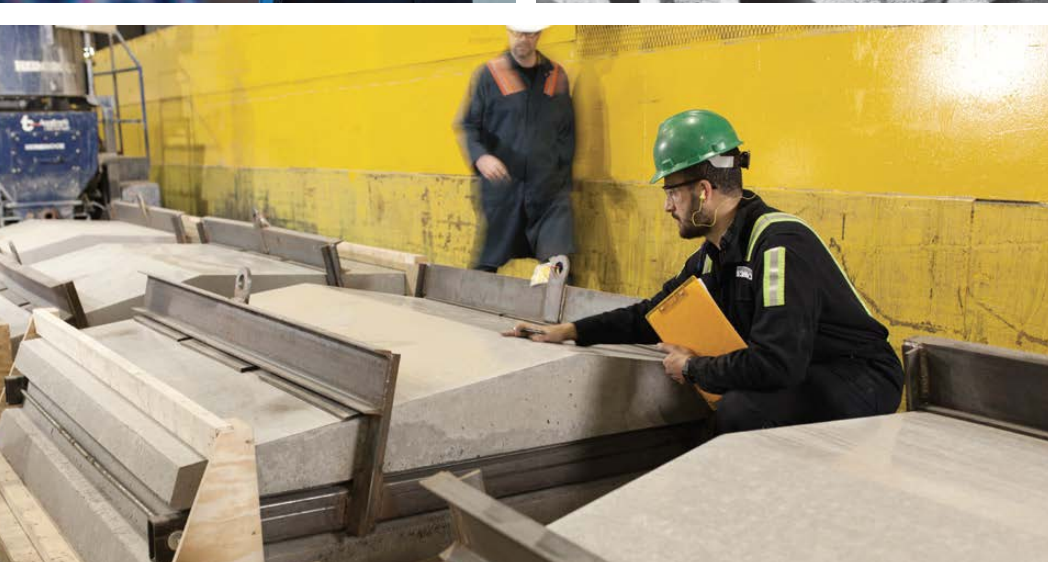
Calderys and HWI have supplied refractory solutions to some of the world's largest cement producers for decades. The new basic bricks range from CAPES brings this global experience to Indian cement plants for the first time in a locally manufactured product.

Quality you can measure

ISO 9001 certified. Full batch traceability. In-house testing lab. Every pallet shipped with a full quality certificate.

Inventory solutions

Calderys maintains safety stock of key grades in India, enabling rapid response for planned shutdowns and emergency relining requirements. Ask about our just-in-time delivery programme.





Speak to Calderys today

Bhagirathi Singh | Bhagirathi.Singh@calderys.com | +61 434745006



www.calderys.com

