CCEWOOL®

Steel Industry High-Temperature Insulation Solutions

Advanced Thermal Management for Ironmaking, Steelmaking, Rolling & Heat Treatment Processes

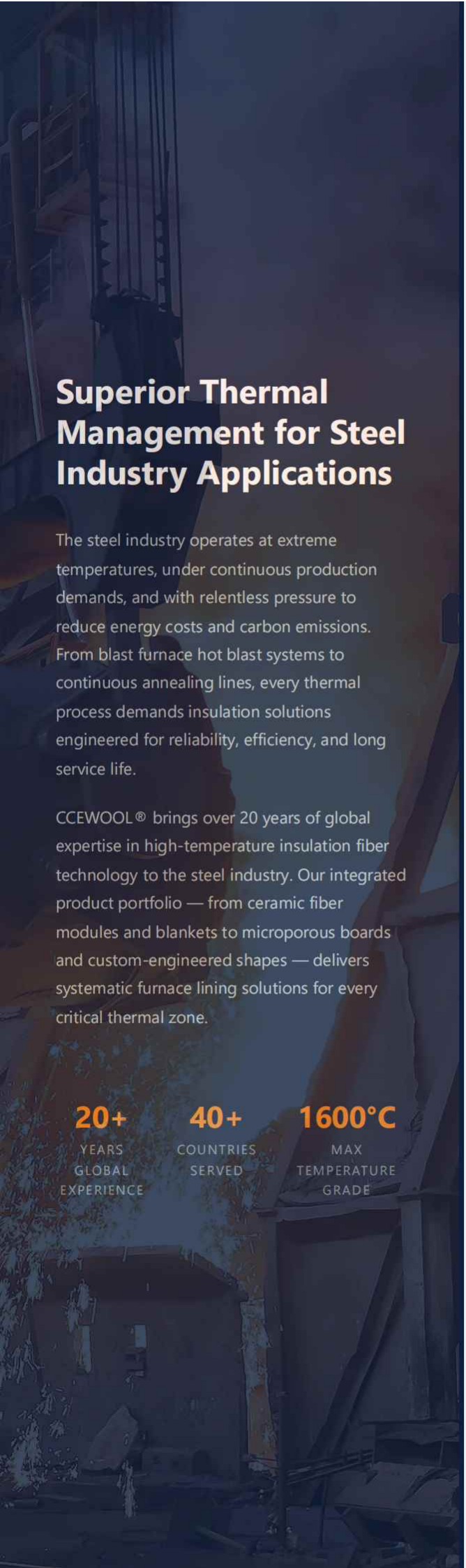
ENERGY EFFICIENCY

FURNACE LINING

HEAT CONTAINMENT

PROCESS RELIABILITY

ENGINEERING HIGH-TEMPERATURE SOLUTIONS FOR THE GLOBAL STEEL INDUSTRY



Superior Thermal Management for Steel Industry Applications

The steel industry operates at extreme temperatures, under continuous production demands, and with relentless pressure to reduce energy costs and carbon emissions. From blast furnace hot blast systems to continuous annealing lines, every thermal process demands insulation solutions engineered for reliability, efficiency, and long service life.

CCEWOOL® brings over 20 years of global expertise in high-temperature insulation fiber technology to the steel industry. Our integrated product portfolio — from ceramic fiber modules and blankets to microporous boards and custom-engineered shapes — delivers systematic furnace lining solutions for every critical thermal zone.

20+
YEARS GLOBAL EXPERIENCE

40+
COUNTRIES SERVED

1600°C
MAX TEMPERATURE GRADE

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SECTION 01

The Steel Industry Challenge

High Temperatures. Continuous Operation. Relentless Energy Demand.

The steel industry is one of the world's most energy-intensive sectors. Modern steel production follows two primary process routes: the integrated **BF-BOF route** (blast furnace → basic oxygen furnace) and the **EAF route** (electric arc furnace using scrap or DRI). Both routes involve numerous high-temperature thermal processes operating between 800°C and 1,600°C.

Critical Thermal Equipment in Steel Production

Throughout the steelmaking process, critical thermal equipment operates continuously under extreme heat loads:

Reheating Furnaces

Walking beam, pusher-type, and roller hearth furnaces heat slabs, billets, and blooms to 1,100–1,250°C before hot rolling.

Heat Treatment Furnaces

Bell annealers, bogie hearth furnaces, and continuous annealing lines require precise temperature uniformity and atmosphere control.

Ironmaking Systems

Hot blast stoves deliver 1,100–1,300°C blast air to blast furnaces. Coke ovens operate above 1,000°C for decades.

Coating Lines

Continuous galvanizing and annealing lines demand stable protective atmospheres and precise thermal profiles for surface quality.

Flue & Duct Systems

High-temperature exhaust gases carry recoverable heat. Inadequate insulation causes continuous energy losses.

Complex Nodes

Burner ports, roller penetrations, expansion joints, peepholes, and door seals are critical thermal bridge and leakage points.

Key Industry Drivers

- Rising energy costs and carbon reduction mandates
- Demand for continuous, uninterrupted production
- Need for extended furnace lining service life
- Stricter shell temperature and workplace safety requirements
- System-level optimization beyond single-product replacement

Thermal Loss Impact

Heat losses through furnace walls, roofs, doors, roller penetrations, and flue systems directly increase fuel consumption, destabilize process temperatures, and shorten equipment life. Systematic insulation design is no longer optional — it is a competitive necessity.

SECTION 02

CCEWOOL® Solutions for the Steel Industry

A Systematic Approach to Furnace Lining Design

Steel industry energy optimization is not about simply switching to one insulation product. It requires a **systematic, zone-by-zone approach** that considers furnace structure, temperature distribution, hot-face conditions, gas flow patterns, door operation frequency, roller/trolley sealing, and long-term maintenance cycles.

Product System for Complete Thermal Management

Ceramic Fiber Blankets & Modules

Low heat storage, rapid thermal response, excellent thermal shock resistance. Ideal for furnace roofs, upper sidewalls, and large-area hot-face linings. Temperature grades: 1,100°C to 1,600°C.

Ceramic Fiber Boards & Papers

Rigid and semi-rigid insulation for backup layers, door linings, and interface sealing. Excellent machinability and dimensional stability.

Ceramic Fiber Textiles & Custom Shapes

Cloth, tape, rope, and yarn for flexible sealing, expansion joint compensation, and complex geometry sealing. Vacuum-formed shapes for burner blocks, peephole liners, and custom nodes.

Microporous & Calcium Silicate Boards

Ultra-low thermal conductivity backup insulation where space is limited but thermal resistance requirements are high. Excellent compressive strength for load-bearing areas.

Insulating Fire Bricks (IFB)

Structural backup insulation combining moderate strength with good thermal performance. Ideal for furnace floors, lower sidewalls, and areas requiring mechanical support.

Engineering-Driven Results

CCEWOOL® solutions help steel producers achieve:

- **Reduced shell temperatures** and heat losses
- **Lower fuel consumption** per ton of steel
- **Faster furnace heat-up** and production flexibility
- **Improved temperature uniformity** for product quality
- **Extended lining service life** and reduced maintenance
- **Minimized thermal bridging** at critical nodes

Zone-Based Design Philosophy

Every furnace zone has unique thermal, mechanical, and chemical demands. Our approach matches the right material to each zone:

- **Roof & Upper Walls** — Low heat storage, rapid thermal response
- **Lower Walls & Floor** — Wear resistance + backup insulation
- **Doors & Openings** — Continuous sealing, thermal cycling resistance
- **Roller Penetrations** — Thermal bridge control, flexible sealing
- **Flue & Duct Systems** — Heat recovery optimization
- **Complex Nodes** — Custom-engineered shapes and seals

SECTION 03

Walking Beam Reheating Furnace

Optimized Lining for Low Heat Loss, Long Life & Temperature Uniformity

The walking beam furnace is the most common billet/slab reheating equipment in modern steel rolling mills. Steel is heated to 1,100–1,250°C before entering the rolling mill. Compared to pusher-type furnaces, the walking beam design reduces contact between the workpiece and furnace floor, improving heating uniformity — but it introduces unique thermal challenges at the walking beam penetrations, water-cooled skid systems, and large door openings.

System Value

A systematic approach to walking beam furnace lining delivers:

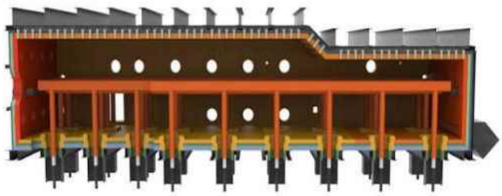
- Reduced fuel consumption per ton heated
- Controlled shell temperatures
- Improved billet heating uniformity
- Extended lining service life
- Stable, efficient thermal conditions for continuous rolling production

Key Insulation Zones

Roof & Upper Sidewall — Low Heat Storage Lining

The largest heat-receiving area. Traditional dense refractories absorb significant heat during warm-up, wasting fuel. CCEWOOL® ceramic fiber modules, blankets, and boards create a low thermal mass lining that reduces heat absorption, accelerates furnace heat-up, and improves thermal efficiency.

Products: Ceramic Fiber Modules, Blankets, Boards | Microporous Boards for space-limited zones



Doors & Charging/Discharging Openings — Continuous Sealing

The highest dynamic heat loss areas. Hot furnace gas escapes and cold air infiltrates during continuous billet movement. CCEWOOL® ceramic fiber paper, cloth, tape, rope, and custom shapes provide continuous sealing at door frames, peepholes, inspection ports, and edge gaps.

Products: Ceramic Fiber Paper, Cloth, Tape, Rope | Vacuum-Formed Shapes

Walking Beams & Water-Cooled Skids — Thermal Bridge Control

Beams passing through the furnace create natural conduction paths to the exterior. Even with excellent wall and roof insulation, significant heat is lost through beam structures. CCEWOOL® boards, papers, microporous insulation, and custom components reduce thermal bridging at support nodes and interfaces.

Products: Ceramic Fiber Boards, Paper, Microporous Boards | Custom Insulation Components

Flue & Exhaust System Insulation

Combustion exhaust carries substantial recoverable heat. Inadequate flue insulation causes continuous energy loss and elevated external surface temperatures. CCEWOOL® blankets, boards, and microporous products optimize flue and heat exchanger insulation.

Products: Ceramic Fiber Blankets, Boards, Microporous Boards

Complex Nodes — Burner Ports, Roller Penetrations, Expansion Joints

SECTION 04

Pusher-Type Continuous Reheating Furnace

Balancing Wear Resistance with Insulation Efficiency

Pusher-type furnaces are widely used for reheating slabs, billets, blooms, and tube rounds. Billets are pushed continuously along the furnace floor through preheating, heating, and soaking zones. While simpler and lower in capital cost than walking beam furnaces, the furnace floor endures constant abrasion from steel billets, scale accumulation, and high-temperature exposure — demanding a carefully balanced approach to wear resistance and thermal insulation.

Furnace Floor & Skid Rail Backup Insulation

The floor is the most mechanically demanding zone. A layered design combines a wear-resistant hot-face working layer with high-efficiency backup insulation. CCEWOOL® microporous boards provide maximum thermal resistance in limited space; calcium silicate boards offer compressive strength; ceramic fiber boards address local thermal bridging.

Products: Microporous Boards | Calcium Silicate Boards | Ceramic Fiber Boards | IFB

Lower Sidewall — Durability Meets Insulation

Close to the billet path, lower sidewalls face radiant heat, scale erosion, and occasional mechanical impact. A dual-layer design with a refractory working face and lightweight insulation backup balances structural reliability with energy savings.

Products: Ceramic Fiber Boards | Microporous Boards | IFB | Textile Seals for joints

Roof & Upper Sidewall — Low Heat Storage Design

As the largest uninterrupted insulation area, the roof and upper sidewall benefit most from low thermal mass fiber linings. CCEWOOL® modules for large areas, blankets for backup layers, and microporous boards where thickness is constrained significantly reduce heat absorption and shell losses.

Products: Ceramic Fiber Modules | Blankets | Boards | Microporous Boards

Doors, Charging/Discharging & Complex Nodes

Pusher rod penetrations, skid supports, burner ports, thermocouple holes, expansion joints, and flue interfaces all form thermal bridges. CCEWOOL® paper for interface isolation, textiles for flexible sealing, and custom shapes for non-standard geometries maintain lining integrity across every node.

Products: Ceramic Fiber Paper | Cloth, Tape, Rope | Vacuum-Formed Shapes | Microporous Boards

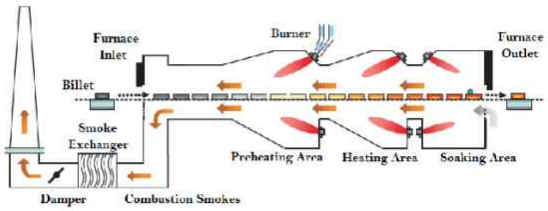
Design Priority

Pusher furnace optimization balances:

- **Floor**: Wear resistance + backup insulation
- **Lower walls**: Erosion resistance + heat containment
- **Upper zones**: Low heat storage, high efficiency
- **Openings & nodes**: Continuous sealing

Long-Term Value

Systematic zone-by-zone design reduces fuel consumption, controls shell temperatures, extends lining service intervals, and delivers stable thermal conditions for continuous rolling operations.



SECTION 05

Roller Hearth Furnace & Heat Treatment

Lining Optimization, Thermal Bridge Control & Temperature Uniformity

Roller hearth furnaces are essential for continuous heating and heat treatment of steel plate, tube, bar, forgings, and bearing components. Workpieces are transported by heat-resistant rollers, creating unique challenges: roller shaft penetrations through walls, thermal bridging along roller axes, door opening losses, and the need for precise hot air circulation and temperature uniformity in heat treatment applications.

Roof & Sidewall Low Heat Storage Lining

The largest heat-receiving surfaces. For continuous production, low thermal mass linings enable faster furnace response and tighter temperature control. CCEWOOL® modules, blankets, and boards combine with microporous backup where shell temperature limits are strict.

Products: Ceramic Fiber Modules | Blankets | Boards | Microporous Boards

Roller Shaft Penetrations — Critical Thermal Bridge Control

The defining challenge of roller hearth furnaces. Metal roller shafts conduct heat continuously from the furnace interior to the exterior drive system. CCEWOOL® paper for interface insulation, textiles for flexible sealing around shafts, blankets for gap filling, and custom shapes for dedicated shaft insulation structures reduce this persistent heat loss.

Products: Ceramic Fiber Paper | Cloth, Tape, Rope | Blankets | Custom Vacuum-Formed Shapes

Hot Air Circulation & Temperature Uniformity

Heat treatment roller hearth furnaces rely on circulation fans, ducting, and multi-zone temperature control. Inadequate duct insulation and leakage at joints compromise temperature uniformity and product quality. CCEWOOL® boards for duct backing, blankets for curved surfaces, papers for flange sealing, and textiles for access port seals maintain thermal efficiency.

Products: Ceramic Fiber Boards | Blankets | Paper | Cloth, Tape, Rope

Doors, Flue Systems & Complex Nodes

Dynamic heat loss areas during continuous workpiece movement. CCEWOOL® blankets for door lining, boards for door structure, papers for frame sealing, and custom shapes for burner ports, peepholes, and thermocouple holes complete the insulation system.

Products: Ceramic Fiber Blankets | Boards | Paper | Textiles | Vacuum-Formed Shapes

Why Roller Penetrations Matter

Metal roller shafts form continuous thermal bridges. Even with excellent wall and roof insulation, unmanaged shaft heat loss can account for a disproportionate share of total furnace energy consumption.

System Benefits

- Reduced energy consumption
- Controlled shell temperatures
- Improved temperature uniformity
- Extended lining life
- Stable, efficient continuous thermal processing

SECTION 06

Bell Annealing Furnace

Energy Optimization & Atmosphere Stability for Coil Annealing

Bell annealing furnaces are among the most critical batch heat treatment systems in the steel industry, widely used for recrystallization annealing, bright annealing, spheroidizing, and stress relief of cold-rolled coils, strip, and wire rod. The thermal efficiency depends not only on insulation performance but also on protective atmosphere sealing quality, circulation heat transfer efficiency, and temperature ramp management.

Heating Cover — Low Heat Storage Lining

The heating cover moves between furnace bases and cycles through heating, holding, and cooling. High thermal mass linings waste fuel by absorbing heat that should go to the coils. CCEWOOL® modules for the main cover, blankets for backup, and microporous boards for thickness-constrained zones significantly reduce cover heat absorption and ramp-up time.

Products: Ceramic Fiber Modules | Blankets | Boards | Microporous Boards

Base, Inner Cover & Atmosphere Sealing

The furnace base and inner cover form the protective atmosphere enclosure. Hydrogen or nitrogen-hydrogen mixtures must maintain stable circulation. Seal failure causes atmosphere contamination, coil surface oxidation, and quality deviation. CCEWOOL® papers for interface compensation, textiles for flexible sealing, blankets for gap filling, and custom shapes for seal blocks maintain gas-tight integrity.

Products: Ceramic Fiber Paper | Cloth, Tape, Rope | Blankets | Custom Vacuum-Formed Shapes

Circulation Fan & Duct System Insulation

Coil internal heat transfer is much slower than furnace gas heating. Efficient circulation is essential for temperature uniformity from coil edge to core. CCEWOOL® boards for duct backing, blankets for complex surfaces, papers for flange gaskets, and textiles for access port seals improve circulation efficiency.

Products: Ceramic Fiber Boards | Blankets | Paper | Cloth, Tape, Rope

Atmosphere Piping & Interface Sealing

Hydrogen, nitrogen, and mixed gas piping, exhaust ports, flanges, burner openings, and valve areas require continuous sealing. CCEWOOL® papers for thin gaskets, textiles for flange and penetration seals, and custom shapes for burner interfaces minimize gas leakage and thermal bridging.

Products: Ceramic Fiber Paper | Cloth, Tape, Rope | Custom Vacuum-Formed Shapes

Key Performance Factors

- Heating cover determines base thermal efficiency
- Base and inner cover determine atmosphere stability
- Circulation system determines coil temperature uniformity
- Atmosphere piping and nodes determine long-term reliability

Value Delivered

Reduced annealing energy consumption, shorter heat-up/cool-down cycles, minimized atmosphere gas losses, improved coil temperature uniformity, and reliable thermal conditions for high-quality cold-rolled products.

SECTION 07

Bogie Hearth Heat Treatment Furnace

Lining Solutions for Large Workpiece Heat Treatment

Bogie hearth furnaces handle large castings, forgings, welded fabrications, pressure vessels, and heavy machinery components through annealing, normalizing, tempering, and stress-relief cycles. As batch-type equipment, each cycle includes charging, heating, holding, cooling, and discharging — demanding low heat storage for fast ramp-up, reliable long-term insulation, effective door sealing, and robust bogie edge sealing during loading/unloading.

Roof & Sidewall — Low Heat Storage Lining

The largest heat-receiving areas. Traditional dense refractories waste fuel heating the lining rather than the workpiece in batch operation. CCEWOOL® modules for large roof and wall areas, blankets for backup, and microporous boards for shell temperature control accelerate heat-up and reduce cycle energy consumption.

Products: Ceramic Fiber Modules | Blankets | Boards | Microporous Boards

Bogie Floor — Load-Bearing Insulation

The bogie floor must support the full weight of heavy workpieces while providing effective downward insulation. A layered design with a strong refractory working surface and high-efficiency backup insulation using microporous boards, ceramic fiber boards, calcium silicate boards, and IFB controls heat flow to the bogie undercarriage.

Products: Microporous Boards | Ceramic Fiber Boards | Calcium Silicate Boards | IFB

Door & Bogie Edge Sealing

Large doors and the running clearance between the bogie and fixed furnace body are persistent heat loss sources. CCEWOOL® blankets for flexible/replaceable seals, papers for interface compensation, textiles for dynamic sealing, and custom shapes for edge flame barriers create a continuous flexible sealing system.

Products: Ceramic Fiber Blankets | Paper | Cloth, Tape, Rope | Custom Vacuum-Formed Shapes

Burner Ports, Peepholes & Complex Nodes

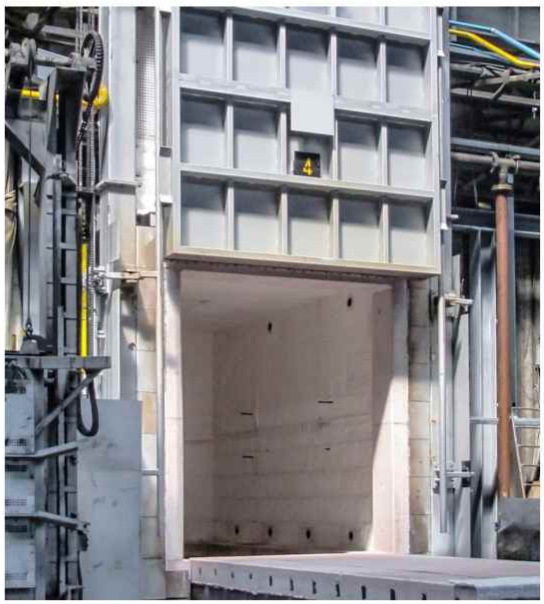
Burner ports, thermocouple holes, inspection ports, and equipment interfaces penetrate the lining, creating thermal bridges and local hot spots. CCEWOOL® custom shapes for burner blocks and peephole liners, papers for interface insulation, and textiles for edge and flange sealing complete the lining.

Products: Vacuum-Formed Shapes | Ceramic Fiber Paper | Cloth, Tape, Rope | Blankets

System Perspective

Bogie hearth furnace optimization manages the entire heat flow path:

- Roof & walls: base heat loss
- Door: opening heat loss
- Floor: long-term insulation
- Bogie edges: dynamic sealing
- Flue: exhaust heat recovery
- Nodes: lining continuity



SECTION 08

Coke Oven Insulation & Door Sealing

Heat Loss Control, Sealing Optimization & Energy Upgrade

Coke ovens are core thermal equipment in ironmaking, converting coking coal into metallurgical coke at sustained temperatures above 1,000°C, with continuous operation often exceeding 10 years. Energy optimization focuses not on modifying the primary refractory structure of carbonization and combustion chambers, but on **reducing door heat leakage, improving top node sealing, minimizing flue heat dissipation, and controlling cold-face heat losses**.

Door & Door Frame Sealing — The Most Critical Zone

Door areas are where heat leakage, emissions, and seal failure concentrate. Doors endure high-temperature radiation, tar deposition, mechanical impact from opening/closing, and repeated thermal cycling throughout charging, coking, and pushing operations. CCEWOOL® blankets for door backing, boards for internal insulation, papers for frame interface, textiles for seal grooves, and custom shapes for door plugs provide comprehensive sealing.

Products: Ceramic Fiber Blankets | Boards | Paper | Cloth, Tape, Rope | Custom Shapes

Top, Charging Holes & Standpipe Node Insulation

The oven top concentrates charging holes, standpipes, gooseneck connections, gas collection interfaces, and access openings. These small areas are where local overheating and leakage concentrate. CCEWOOL® blankets, boards, papers, textiles, and custom shapes provide targeted node reinforcement.

Products: Ceramic Fiber Blankets | Boards | Paper | Cloth, Tape, Rope | Custom Shapes

Cold-Face Backup & Shell Temperature Reduction

Even when primary refractory structures perform normally, inadequate cold-face insulation allows continuous heat transfer to the shell and environment. CCEWOOL® boards, IFB, and microporous boards in the cold-face zone reduce shell temperature without affecting the primary refractory system.

Products: Ceramic Fiber Boards | IFB | Microporous Boards | Blankets

Flue & Waste Gas Duct Insulation

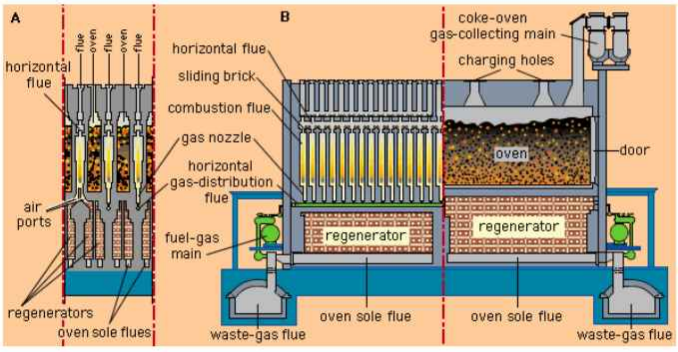
Long-term high-temperature exhaust gas transport makes the flue system a significant energy loss pathway. Inadequate insulation at bends, flanges, expansion joints, and access ports adds to system inefficiency. CCEWOOL® blankets for layer insulation, boards for composite backup, microporous for high-efficiency zones, and textiles for flange sealing optimize the system.

Products: Ceramic Fiber Blankets | Boards | Microporous Boards | Paper, Cloth, Tape, Rope

Coke Oven Optimization Summary

Effective coke oven energy management addresses:

- **Doors**: The primary seal integrity zone
- **Top & standpipe nodes**: Local heat loss control
- **Cold-face backup**: Long-term heat dissipation
- **Flue system**: Waste heat utilization efficiency
- **Complex nodes**: Complete insulation system integrity



SECTION 09

Hot Blast Stove & Hot Blast System

Blast Temperature Stability, Heat Loss Control & Long-Term Energy Optimization

Hot blast stoves are essential to blast furnace ironmaking, heating cold blast air to 1,100–1,300°C before delivery through hot blast mains, bustle pipes, and tuyere systems. Operating under continuous high temperatures with periodic switching between heating and blast cycles, their insulation level directly affects blast temperature stability, fuel efficiency, and overall blast furnace energy consumption.

Dome & Combustion Chamber Cold-Face Backup Insulation

The highest-temperature zones. During the heating cycle, flames and hot gas impinge on the dome and combustion chamber; during the blast cycle, the structure undergoes temperature transition and thermal stress. The hot face uses silica, high-alumina, or mullite brick — CCEWOOL® boards, microporous boards, and IFB serve as cold-face backup, reducing heat transfer to the shell.

Products: Ceramic Fiber Boards | Microporous Boards | IFB | Paper, Textiles for node sealing

Checker Chamber & Shell Insulation

The checker chamber is the core heat exchange zone where checker bricks store combustion heat and transfer it to incoming cold blast air. While checkers perform the primary heat storage function, significant heat is lost through the chamber shell. CCEWOOL® boards, microporous boards, and IFB in the cold-face zone retain more heat in the checker system.

Products: Ceramic Fiber Boards | Microporous Boards | IFB

Hot Blast Main & Distribution System Insulation

Hot blast outlets, mains, bustle pipes, and branch pipes deliver high-temperature blast air from the stove to the blast furnace. Heat loss during long-distance transport directly reduces blast temperature. Even small temperature drops affect the blast furnace fuel rate and productivity. CCEWOOL® blankets for outer wrap, boards for composite backup, microporous for space-limited zones, and textiles for flange and expansion joint sealing maintain transport thermal efficiency.

Products: Ceramic Fiber Blankets | Boards | Microporous Boards | Paper, Textiles

Valves, Expansion Joints & Switching Node Sealing

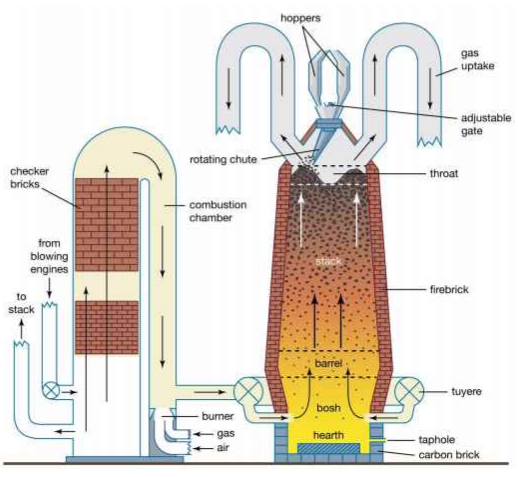
Hot blast valves, cold blast valves, waste gas valves, mixing pipes, and expansion joints experience frequent hot-cold cycling and thermal expansion. These are where air leakage, heat loss, thermal bridging, and seal failure concentrate. CCEWOOL® papers for thin gaskets, textiles for flange and valve interface seals, blankets for flexible compensation, and custom shapes for complex penetrations ensure reliability.

Products: Ceramic Fiber Paper | Cloth, Tape, Rope | Blankets | Custom Shapes

System Impact

Hot blast stove insulation affects the entire blast furnace operation:

- Dome & combustion chamber → high-zone thermal efficiency
- Checker chamber → heat storage and blast temperature
- Hot blast main → heat transport efficiency
- Valves & switching nodes → system seal stability
- Flue system → waste heat utilization
- Complex nodes → complete insulation integrity



SECTION 10

Continuous Annealing & Galvanizing Lines

Temperature Uniformity, Atmosphere Sealing & Energy Optimization for Strip Processing

Continuous annealing lines (CAL) and continuous galvanizing lines (CGL) are among the most critical downstream processing facilities, producing automotive sheet, appliance steel, high-strength steel, and coated products. These lines complete strip heating, soaking, cooling, and surface treatment under continuous operation. Precise strip temperature profiles, stable protective atmospheres, and surface quality demands make thermal management integral to product quality, not just energy efficiency.

Heating & Soaking Zone Lining

The highest energy consumption zones where strip is rapidly heated and held at target temperature to achieve desired microstructure and mechanical properties. CCEWOOL® modules for roof and wall large-area low heat storage linings, blankets for backup, and boards/microporous for thickness-constrained areas minimize heat loss and maintain temperature uniformity.

Products: Ceramic Fiber Modules | Blankets | Boards | Microporous Boards

Roller Penetration & Shaft Sealing

Numerous hearth rolls transport strip continuously. Each roller shaft penetration through the furnace wall is a potential thermal bridge and atmosphere leak point. CCEWOOL® papers for interface insulation and gap compensation, textiles for flexible shaft sealing, and custom shapes for complex penetration structures maintain atmosphere integrity and reduce thermal bridging.

Products: Ceramic Fiber Paper | Cloth, Tape, Rope | Custom Vacuum-Formed Shapes

Snout Zone — Annealing-to-Galvanizing Transition

The snout is a unique and critical structure in CGLs, connecting the annealing furnace exit to the zinc pot entry. It must maintain strip temperature stability, preserve protective atmosphere continuity, and resist zinc vapor effects. CCEWOOL® boards for local insulation, papers for overlap zones, textiles for edge and gap sealing, and custom shapes for complex geometries support stable process transition.

Products: Ceramic Fiber Boards | Paper | Cloth, Tape, Rope | Custom Shapes

Cooling Ducts, Circulation System & Complex Nodes

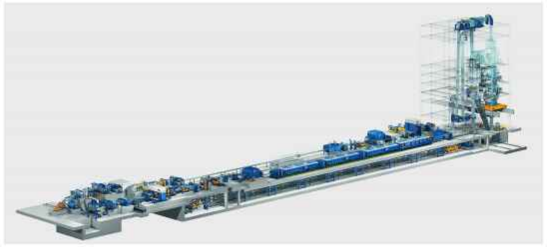
Circulation fans, ducting, and cooling sections control strip cooling rates. CCEWOOL® blankets for duct wrap, boards for duct lining, microporous for space-limited zones, papers for interface gaskets, textiles for expansion joints, and custom shapes for non-standard nodes complete the thermal management system.

Products: Ceramic Fiber Blankets | Boards | Microporous Boards | Paper | Textiles | Custom Shapes

Quality-Critical Design

For CAL and CGL, thermal management directly impacts product quality:

- Heating & soaking zones → strip metallurgical quality
- Roller penetrations → thermal bridge & atmosphere seal
- Snout zone → annealing-to-coating transition stability
- Cooling ducts → temperature control precision
- Complex nodes → complete system integrity



SECTION 11

Product Portfolio for Steel Industry Applications

Complete High-Temperature Insulation Product Range

CCEWOOL® provides a comprehensive portfolio of high-performance insulation products, from traditional ceramic fiber to bio-soluble fiber, polycrystalline fiber, and advanced microporous insulation. Each product category serves specific temperature, mechanical, and application requirements across steel industry thermal processes.

CERAMIC FIBER BLANKET
Up to 1,600°C

CERAMIC FIBER MODULE
Up to 1,600°C

CERAMIC FIBER BOARD
Up to 1,430°C

CERAMIC FIBER PAPER
Up to 1,430°C

CERAMIC FIBER TEXTILE
Up to 1,260°C

CERAMIC FIBER BULK
Up to 1,600°C

VACUUM FORMED SHAPE
Up to 1,430°C

MICROPOROUS BOARD
Up to 1,050°C

CALCIUM SILICATE BOARD
Up to 1,000°C

INSULATING FIRE BRICK
Up to 1,760°C

Core Product Technologies

Ceramic Fiber (RCF) Products

Alumina-silicate fiber products with excellent high-temperature stability, low thermal conductivity, low heat storage, and superior thermal shock resistance. Classification temperatures from 1,100°C to 1,430°C. Available as blanket, module, board, paper, textile, bulk, and vacuum-formed shapes.

Low Biopersistent Fiber (LBP) Products

Alkaline earth silicate (AES) fiber products with enhanced solubility and biosafety characteristics. Classification temperatures of 1,200°C and 1,300°C. Exempt from carcinogen classification under GHS and IARC standards. Certified by Germany's Fraunhofer Institute.

Polycrystalline Wool (PCW) Products

High-alumina fiber produced via sol-gel technology with up to 73% Al2O3 content. Classification temperature of 1,600°C. Extremely low shot content, superior corrosion resistance, and excellent thermal stability for the most demanding high-temperature applications.

Microporous Insulation

Ultra-low thermal conductivity boards providing maximum thermal resistance in minimum thickness. Ideal for backup insulation where space is constrained but thermal performance requirements are high. Available in multiple density grades.

Calcium Silicate Boards

High compressive strength insulation boards for load-bearing applications requiring both structural support and thermal performance. Temperature grades up to 650°C and 1,000°C.

Insulating Fire Bricks (IFB)

Lightweight refractory bricks combining structural integrity with good thermal insulation. Multiple temperature grades from 1,260°C to 1,760°C. Suitable for furnace floors, lower sidewalls, and structural backup layers.

Custom Engineering

Beyond standard products, CCEWOOL® provides custom vacuum-formed shapes, precision-cut boards, tailored textile assemblies, and application-specific composite designs — all engineered to your furnace's exact dimensional and performance requirements.

SECTION 12

Engineering Services & Partnership

Harnessing 20+ years of high-temperature insulation expertise to deliver engineered solutions for the global steel industry.

Application Engineering

Our technical team works directly with your plant engineers to analyze furnace operating conditions, identify critical heat loss zones, and develop customized lining configurations. We provide heat flow calculations, thermal efficiency analysis, and detailed material recommendations for each furnace zone.

Installation Support & Supervision

On-site installation guidance ensures lining systems are installed correctly and perform as designed. From module anchoring to expansion joint detailing, our supervision services help achieve the designed thermal performance and extend lining service life.

Custom Fabrication

Vacuum-formed shapes, custom-cut boards, tailored textile assemblies, and application-specific composite structures — manufactured to your drawings and specifications. We work from your 2D/3D CAD models to deliver precision-engineered insulation components.

Global Supply Chain

With manufacturing and warehousing operations across Asia and North America, CCEWOOL® provides reliable, timely delivery to steel producers worldwide. Our North American warehouses in Charlotte, NC and Youngstown, OH ensure rapid response for urgent requirements.

Quality Assurance

All CCEWOOL® products are manufactured under ISO 9001 quality management systems. We provide factory inspection reports per EU and ASTM standards, CE certification, REACH registration, and independent laboratory test results to verify material performance.

Technical Documentation

Comprehensive technical data sheets, material safety data sheets (MSDS), installation guidelines, and application case studies support your engineering, procurement, and maintenance teams throughout the project lifecycle.

Why Partner with CCEWOOL®

- **20+ years** of specialized experience in high-temperature insulation fiber technology
- **Complete product portfolio** covering all temperature grades and application requirements
- **Engineering-driven approach** — we design solutions, not just supply products
- **Global presence** with brand agents in 40+ countries and North American warehousing
- **Proven quality** validated by 30+ international exhibitions and independent certifications
- **Customer transparency** with real-time production and shipment video documentation

CCEWOOL®

Advanced Thermal Engineering & Fabrication Solutions

CONTACT US

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CCEWOOL® specializes in providing comprehensive thermal energy-saving solutions for industrial kilns and furnaces across the metallurgy, steel, petrochemical, power generation, ceramic, glass, and new energy sectors. Our engineering team combines materials science expertise with practical application knowledge to deliver optimized furnace lining solutions that reduce energy consumption and improve process reliability.