



Financial Results Briefing for the Second Quarter of the Fiscal Year Ending March 2024

December 4, 2023

KROSAKI HARIMA CORPORATION

(Securities Code: 5352)

1. Overview of Financial Results for the First 2Qs of the Fiscal Year Ending March 2024
2. Full-year Business Results Forecast
3. Overview of and Progress on the Revised 2025 Management Plan
4. Initiatives to Promote Sustainability

[Reference] Overview of the Company

Overview of Financial Results for the First 2Qs of the Fiscal Year Ending March 2024 (First Half of FY2023)

Overview of Financial Results for the First 2Qs of the Fiscal Year Ending March 2024 (Consolidated)

Overview of Business Results

(Billions of yen)

	First half of FY2022	First half of FY2023	Year-on-year change	
Net sales	80.59	89.39	+ 8.80	+ 10.9%
Operating profit	4.91	7.59	+ 2.68	+ 54.6%
Ordinary profit	5.68	8.59	+ 2.91	+ 51.2%
Profit ^{*1}	3.57	6.61	+ 3.04	+ 85.1%
ROS ^{*2}	7.1%	9.6%	+ 2.5 pt	
ROE ^{*3}	10.5%	17.2%	+ 6.7 pt	

Net sales and profit marked new record highs for a half.

Business Environment

- Domestic total crude steel output (first half of FY2023): 43.76 million tons (down 2.3% year on year)
- Worldwide crude steel output (January to September 2023): 1,406.40 million tons (up 0.1% year on year)
- Total crude steel output in India (January to September 2023): 104.10 million tons (up 11.6% year on year)

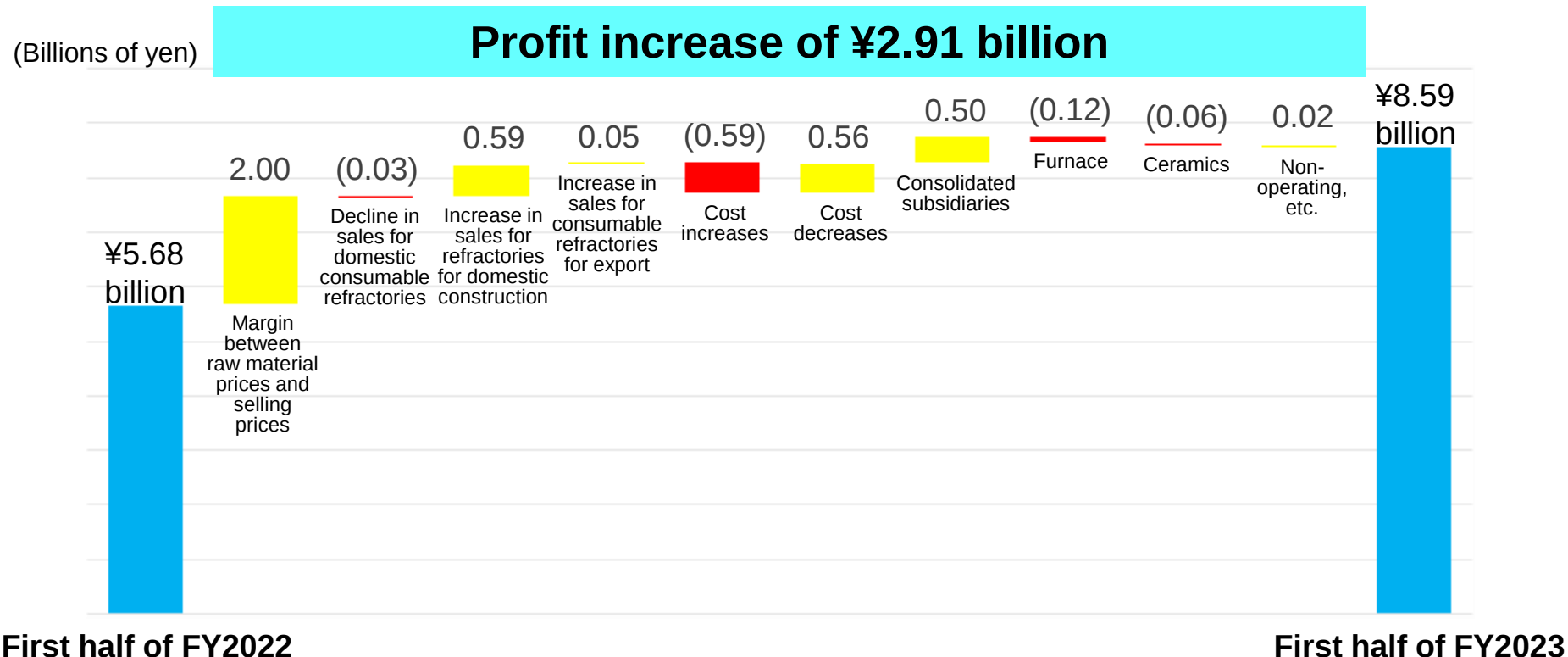
*1: Profit attributable to owners of parent *2: Return on sales (ordinary profit to net sales ratio)

*3: ROE (return on equity) has been calculated by doubling the profit for the first half of the fiscal year

Analysis of Factors Causing Change in Ordinary Profit [First Half of FY2022 vs. First Half of FY2023] (Consolidated)

The Refractories segment in Japan faced a difficult environment caused mainly by soaring prices of raw materials, procured goods, and energy, partly due to the impact of the rapid depreciation of the yen, in addition to a decline in crude steel output. However, profit increased primarily attributable to the steady progress in passing on the rise in costs to selling prices since last year and an increase in sales for refractories for construction.

The Refractories segment saw an increase in profit overseas as well largely owing to expanded business in the strong Indian steel market and efforts to increase sales in non-ferrous materials fields, mainly in Europe. The Group achieved a year-on-year increase in profit of ¥2.91 billion on a consolidated basis.



Financial Position (Consolidated)

<Balance Sheets>

(Billions of yen)

	March 31, 2023	September 30, 2023	Change	Main factors
Assets	163.34	171.31	+ 7.97	—
Current assets	108.22	115.24	+ 7.02	Increase in accounts receivable due to increase in sales
Property, plant and equipment and intangible assets	43.67	45.94	+ 2.27	Acquisition of machinery and equipment
Investments and other assets	11.43	10.11	- 1.32	Sale of investment securities
Liabilities	85.48	85.82	+ 0.34	—
Net assets	77.85	85.48	+ 7.63	Increase in retained earnings
Balance of interest-bearing liabilities	39.38	39.85	+ 0.46	
D/E ratio	0.54	0.49	- 0.04	
Equity ratio	45.0%	47.0%	+ 2.0pt	

<Cash Flows>

	First half of FY2022	First half of FY2023	Main factors
Cash flows from operating activities	(0.48)	5.81	Increase in profit before income taxes
Cash flows from investing activities	(2.02)	(2.15)	Increase in capital investment (¥4.15 billion) and sale of investment securities
Free cash flow	(2.51)	3.66	—
Cash flows from financing activities	1.95	(1.94)	Dividends paid

Business Results by Segment (Consolidated)

(Billions of yen)

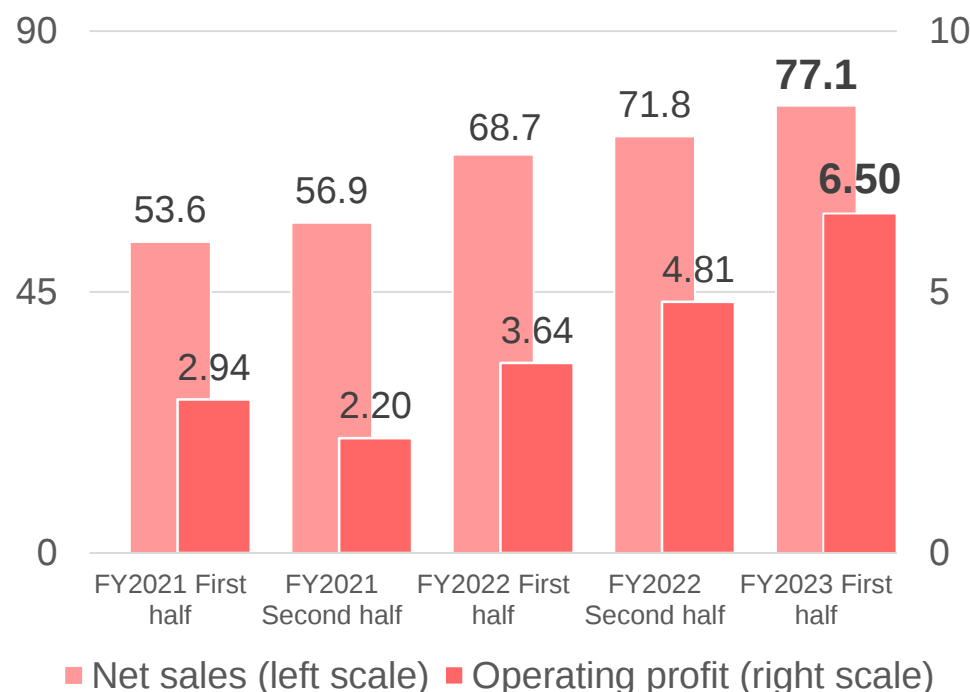
		First half of FY2022	First half of FY2023	Year-on-year change	
Refractories	Net sales	68.70	77.13	+ 8.43	+ 12.3%
	Segment profit	3.64	6.50	+ 2.86	+ 78.7%
Furnace	Net sales	6.99	7.32	+ 0.32	+ 4.6%
	Segment profit	0.41	0.30	- 0.11	- 27.1%
Ceramics	Net sales	4.13	4.15	+ 0.01	+ 0.5%
	Segment profit	0.55	0.49	- 0.06	- 11.3%
Real estate and others	Net sales	0.75	0.78	+ 0.02	+ 3.7%
	Segment profit	0.30	0.29	- 0.00	- 1.2%
Total	Net sales	80.59	89.39	+ 8.80	+ 10.9%
	Segment profit	4.91	7.59	+ 2.68	+ 54.6%

Note: The net sales of each segment represent sales to external customers and do not include inter-segment sales or transfers. The amounts of segment profit are based on operating profit.

Business Results

(Billions of yen)

	First half of FY2022	First half of FY2023	Year-on-year change	
Net sales	68.70	77.13	+ 8.43	+ 12.3%
Operating profit	3.64	6.50	+ 2.86	+ 78.7%



Review of the First Half

- We achieved a new record high in consolidated sales and profit.
- Sales and profit both increased due to expanded business in the strong Indian steel market and efforts to increase sales in non-ferrous materials fields, mainly in Europe, in addition to the steady progress in passing on the rising prices of raw material, energy and other costs increases to selling prices since last year.

Initiatives for the Future

- In Japan, further enhance competitiveness through the promotion of automation, labor saving, and digital transformation, as well as market launch of new products by using our technological strength, and strengthen the revenue base.
- In India, further increase our production capacity to steadily capture the growing demand.
- In Europe and the United States, aim to further increase business revenue through deeper cooperation between alliance partner companies and manufacturing and sales bases of the Company.

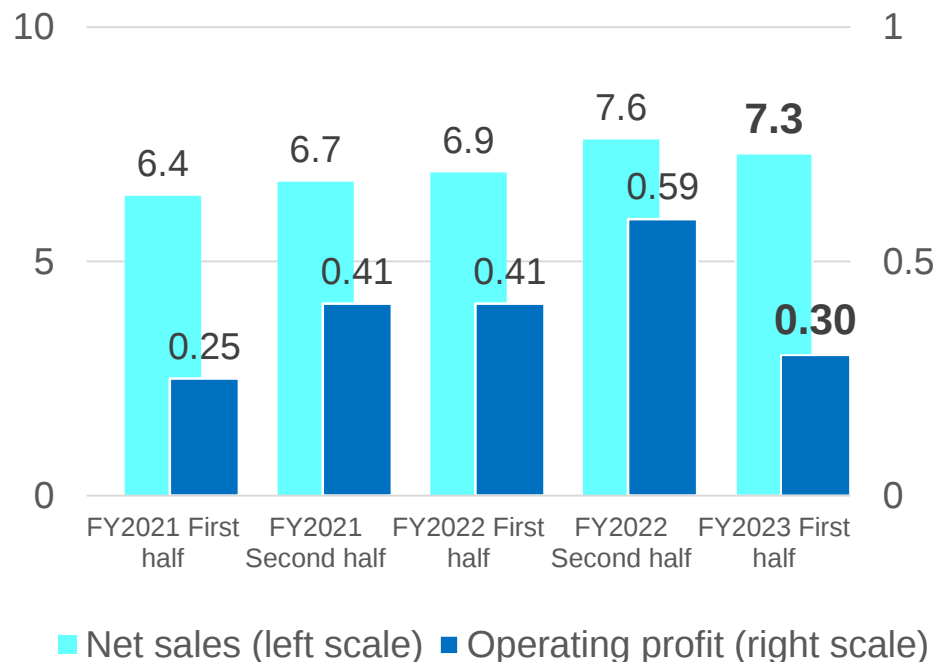
Business Results

(Billions of yen)

	First half of FY2022	First half of FY2023	Year-on-year change	
Net sales	6.99	7.32	+ 0.32	+ 4.6%
Operating profit	0.41	0.30	- 0.11	- 27.1%

Review of the First Half

- Sales increased due to orders received for large-scale construction projects, while profit decreased owing in part to differences in the composition of orders received.



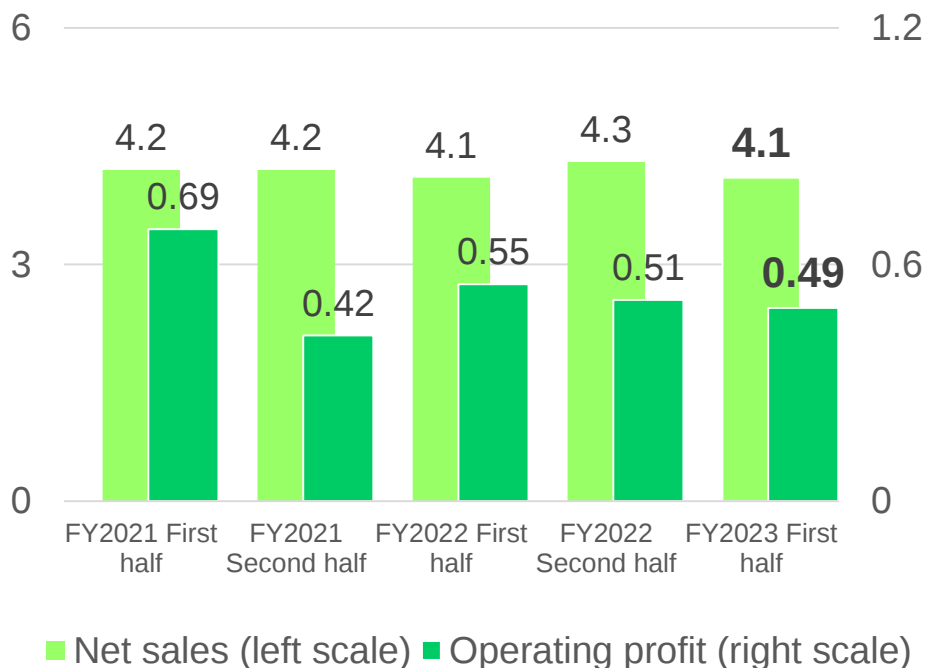
Initiatives for the Future

- Increase earning power by steadily capturing large-scale construction projects, continuing to receive orders for maintenance work for steel facilities, and reducing costs through personnel optimization, etc.
- Expand revenue through orders received for new and maintenance projects for non-ferrous materials users such as biomass and other power generation boilers and incinerators, in addition to the design and construction of energy-saving industrial furnaces.

Business Results

(Billions of yen)

	First half of FY2022	First half of FY2023	Year-on-year change	
Net sales	4.13	4.15	+ 0.01	+ 0.5%
Operating profit	0.55	0.49	- 0.06	- 11.3%



Review of the First Half

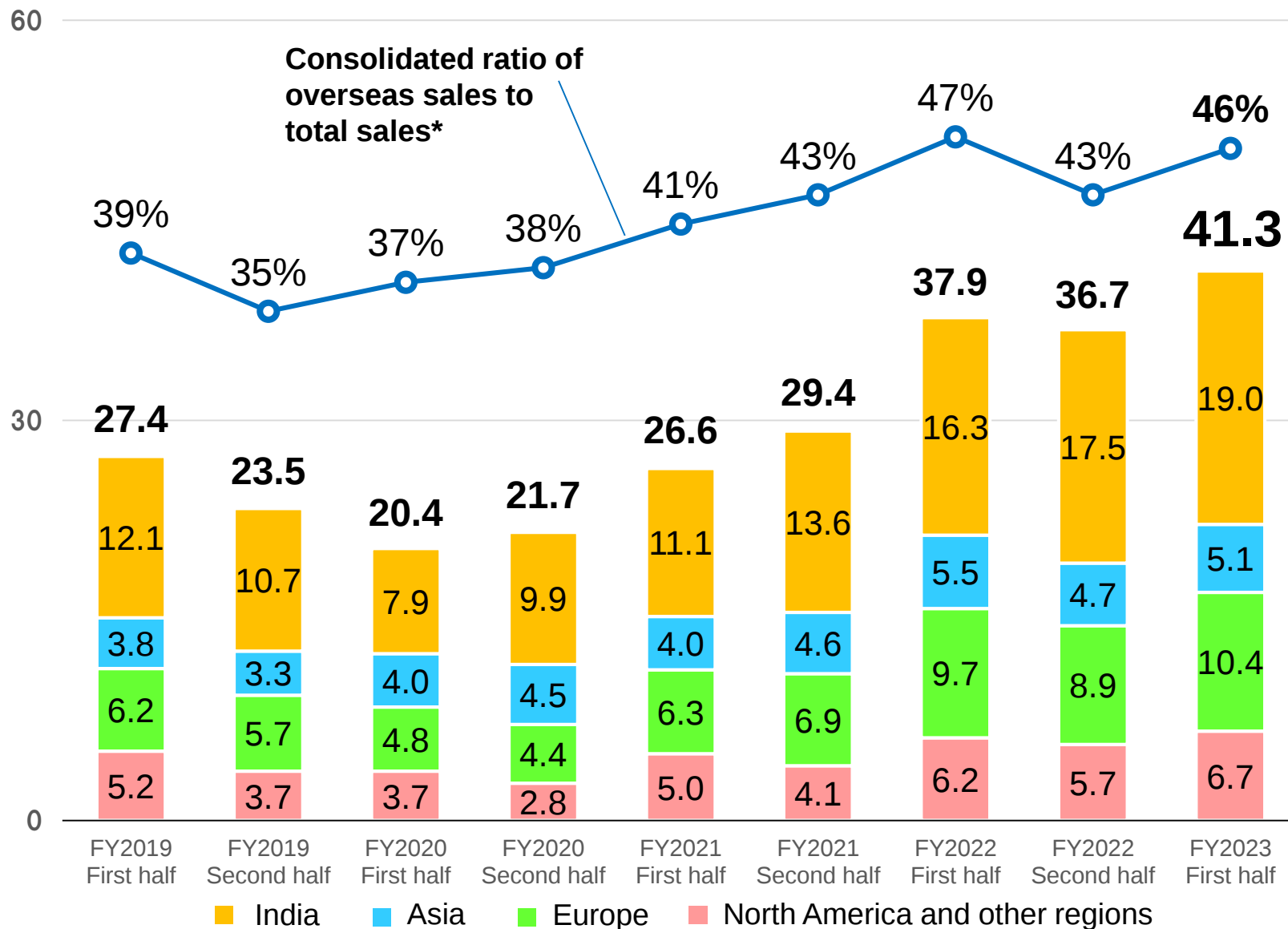
- Sales remained almost the same as demand increased for ceramic products for semiconductor lithography equipment and thermal insulation materials for household fuel cells, while demand declined for products for electronic components. Profit decreased owing to differences in the composition of orders received.

Initiatives for the Future

- Having reached a record high (\$107.6 billion) in 2022, the global sales of semiconductor manufacturing equipment fell into a correction in 2023. However, SEMI* announced a forecast in July that it expected a rebound in 2024. We will steadily capture the growing demand for ceramics primarily for semiconductor lithography equipment.
- We will further grow revenue by driving sales expansion in each field, including thermal insulation materials for the environment field, ceramic materials for electronic components, and products for new fields such as aerospace and healthcare.

Consolidated Overseas Net Sales (in Japanese Yen)

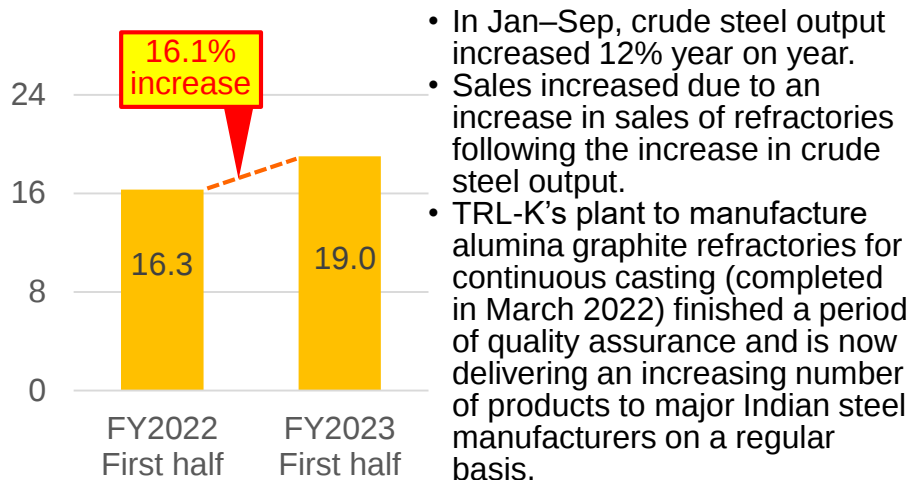
(Billions of yen)



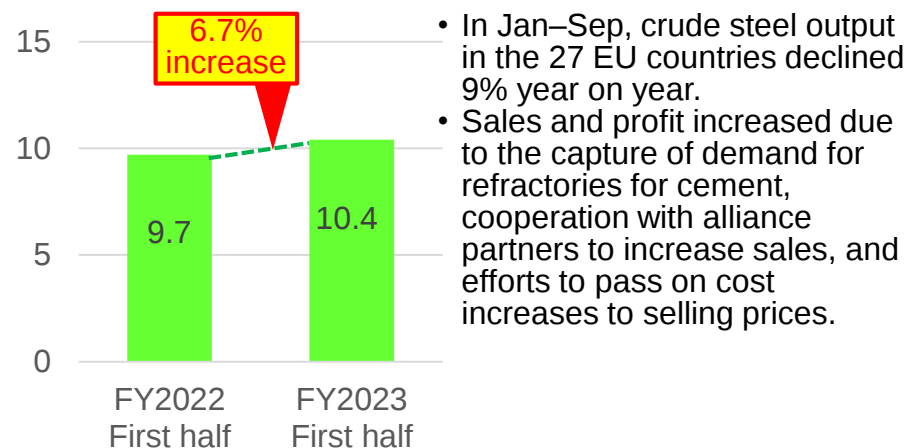
*Percentages are rounded to the nearest whole number.

Consolidated Net Sales by Region (in Billions of Yen)

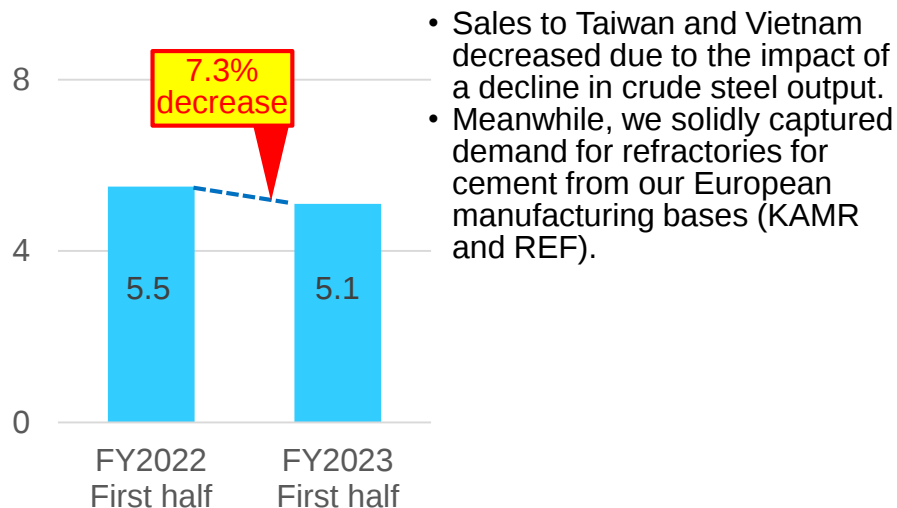
India



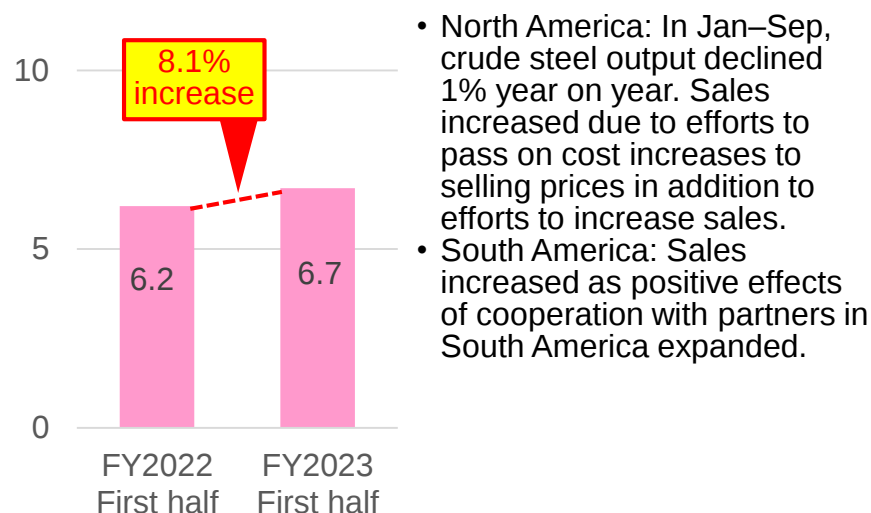
Europe



Asia

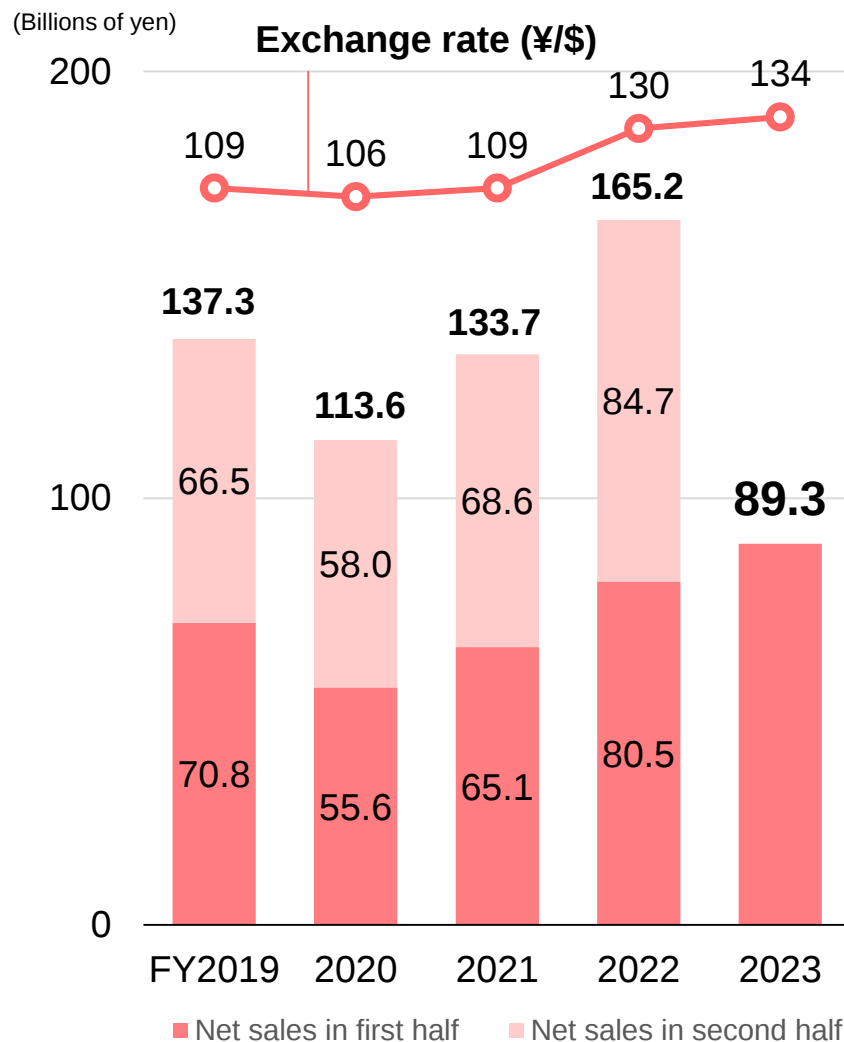


North America and other regions

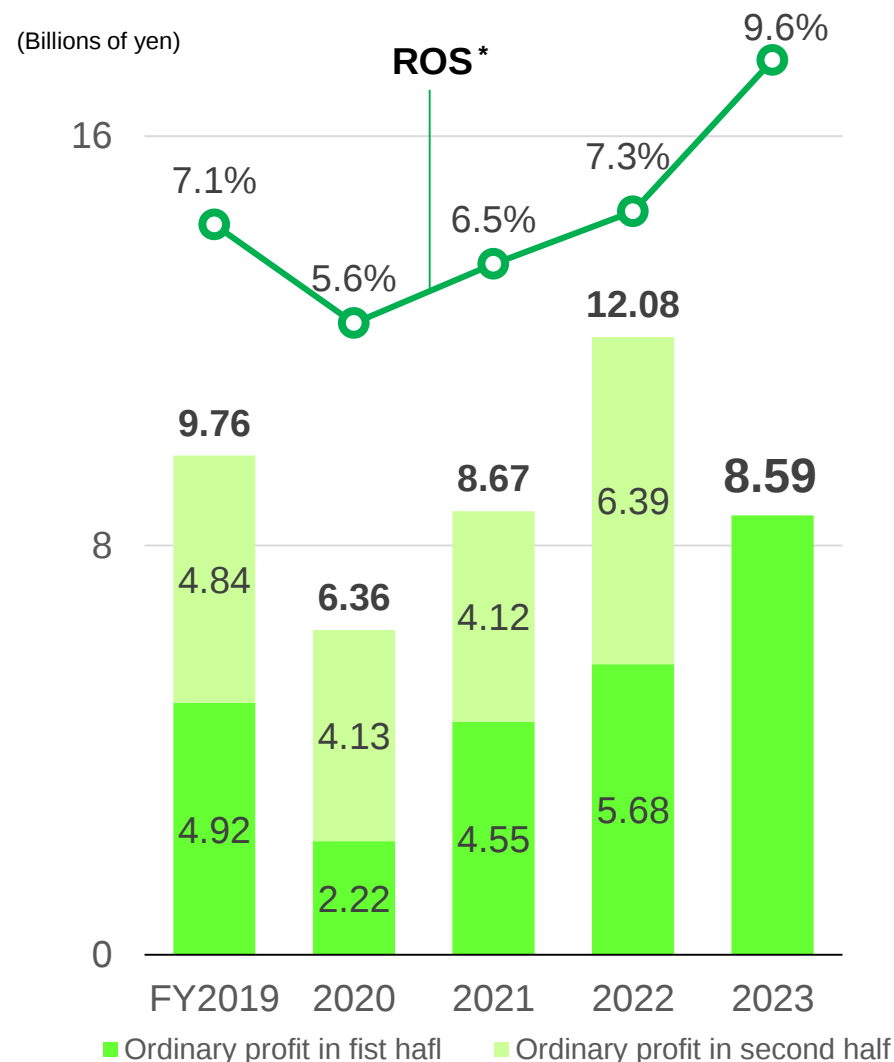


Key Indicators (Consolidated)

Net Sales



Ordinary Profit

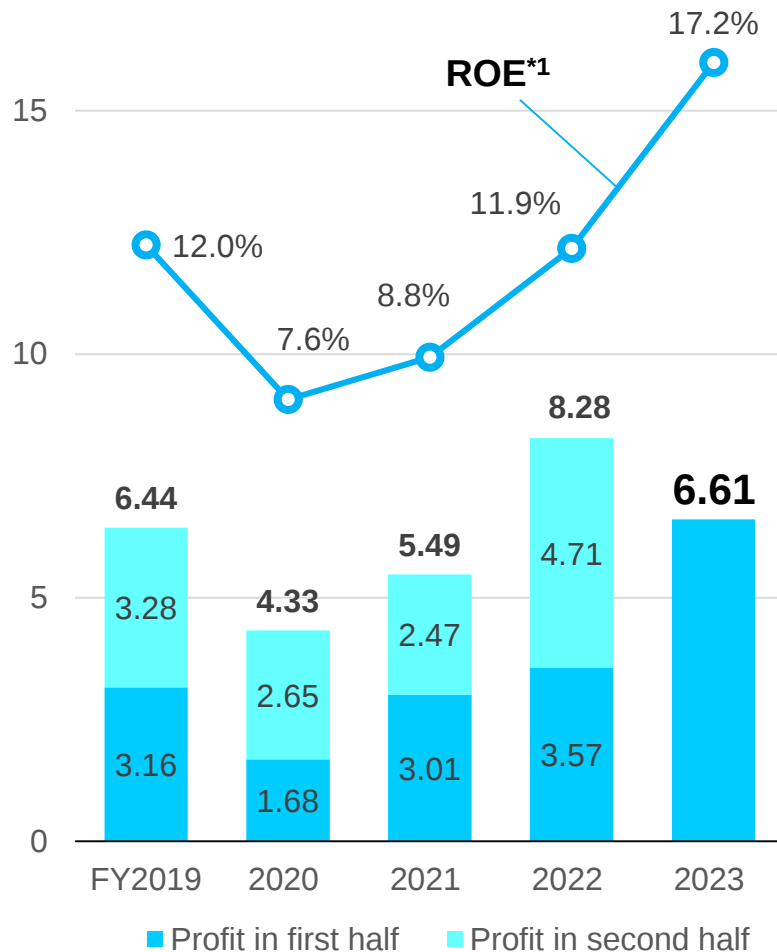


*Full-year return on sales (ordinary profit to net sales ratio). Figures for FY2023 are for the first half.

Key Indicators (Consolidated)

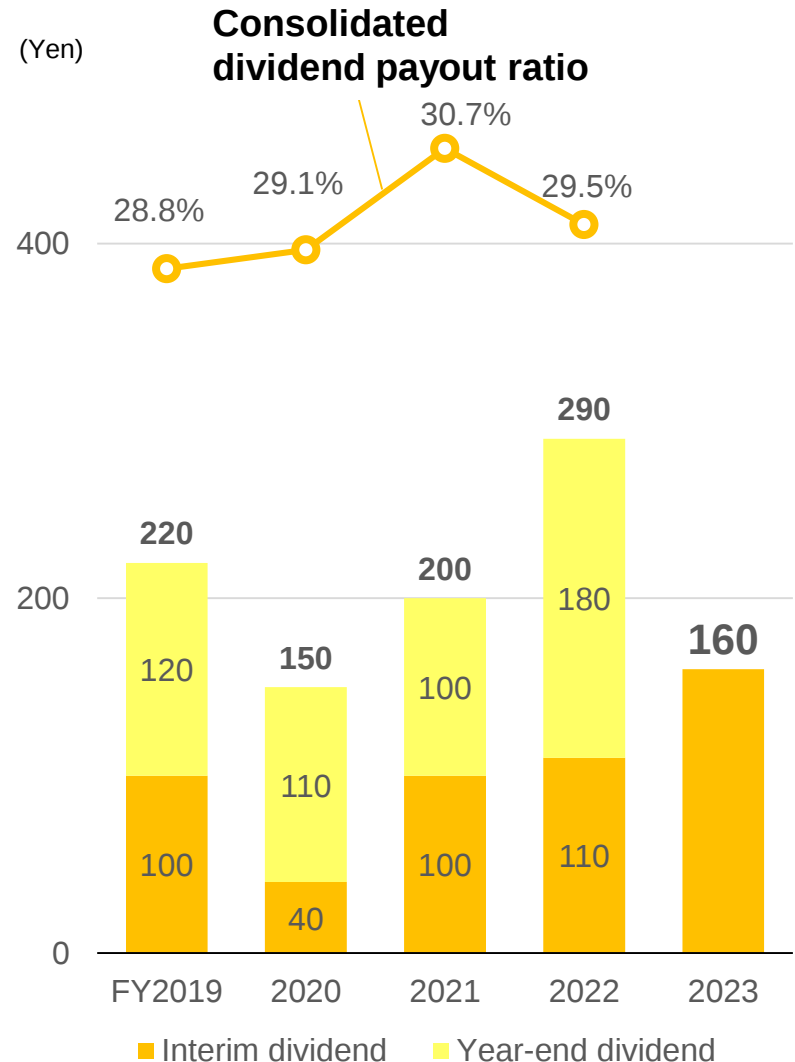
Profit

(Billions of yen)



Shareholder Dividends

(Yen)



*1: Full-year return on equity, calculated by doubling the profit for the first half of the fiscal year for FY2023 only.

2. Full-year Business Results Forecast

We expect significant year-on-year increases in sales and profit due to business expansion in the strong Indian steel market and the expansion of sales to non-ferrous materials fields, mainly in Europe, in addition to the steady progress in passing on the rising prices of raw material, energy and other cost increases to selling prices since last year in the Refractories segment.

(Billions of yen)

	FY2022	FY2023*	Year-on-year change	
Net sales	165.20	174.00	+ 8.79	+ 5.3 %
Operating profit	11.17	13.60	+ 2.42	+ 21.7 %
Ordinary profit	12.08	14.50	+ 2.41	+ 20.0 %
Profit	8.28	12.40	+ 4.11	+ 49.7 %
ROS	7.3%	8.3%	+ 1.0pt	—

* TRL KROSAKI REFRACTORIES LIMITED, a consolidated subsidiary of the Company, plans to sell some of its land in India in the fourth quarter to secure investment funds for sustainable growth in the Indian market.

The Company aims for the sustainable enhancement of its corporate value, while maintaining a sufficient level of shareholders' equity that will be required for business developments going forward. In addition, based on profit distribution in accordance with the business results of each term, the Company carries out dividend of surplus after taking into consideration the future business development, financial condition and business environment of the Company. As a general rule for profit distribution, the Company will employ a consolidated dividend payout ratio of around 30%.

	FY2021	FY2022	FY2023
Interim	100 yen	110 yen	160 yen
Year-end	100 yen	180 yen	210 yen (planned)
Total	200 yen	290 yen	370 yen (planned)

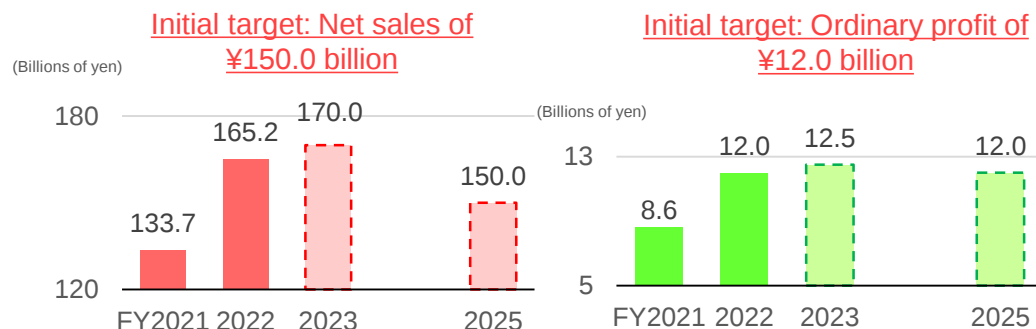


3. Overview of and Progress on the Revised 2025 Management Plan

(1) Revised 2025 Management Plan announced on July 28, 2023

– Reasons for the revision to the 2025 Management Plan and updated numerical targets –

Targets achieved ahead of schedule



Change in the business environment

- Decline in crude steel output in the steel industry (except for India), which is our major customer
- Soaring prices of raw materials, procured goods, and energy, due to factors including the impact of rapid depreciation of the yen

We revised upward the Management Plan to aim for further growth even in a challenging environment by drawing on Krosaki Harima Group's comprehensive expertise.

Target	Before the revision	After the revision	Change
Capital investment plan (five years)	¥20.0 billion	¥35.0 billion	¥15.0 billion
Consolidated net sales	¥150.0 billion	¥180.0 billion	¥30.0 billion
Consolidated ordinary profit	¥12.0 billion	¥15.0 billion	¥3.0 billion
ROS	8.0%	8.3%	0.3%
ROIC	—	9.0% or higher	New target

We added ROIC to our numerical targets, as a cost of capital-conscious KPI.

(1) Revised 2025 Management Plan announced on July 28, 2023

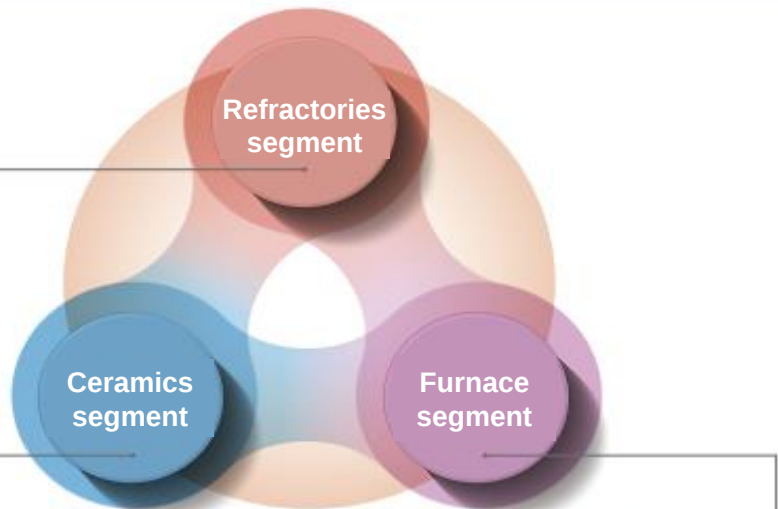
– Basic policy of the revised 2025 Management Plan –

Increasing the earning power and competitiveness of the Refractories segment

- Establish a high-profit structure through increasing sales of high value-added products that will contribute to the maximization of customer value.
- Reduce cost thoroughly, promote development in keeping with trends of customers, who pursue carbon neutrality, and strengthen the research and development system from a global perspective.
- Expand into non-ferrous material and other fields in various markets, including overseas growth markets, by strengthening alliances between Group members and deepening alliances and collaborations with partner companies.

Reinforcing the business foundations on a company-wide basis and promoting contributions to the realization of a sustainable society

- Appropriately implement initiatives in line with our Basic Sustainability Activity Policy, including those related to carbon neutrality.
- Promote safety, environmental, disaster prevention and internal control activities.
- Reinforce the development and recruitment of internationally capable human resources, and promote measures to strengthen human capital.
- Promote DX to increase productivity.



Increasing the earning power of the Ceramics segment

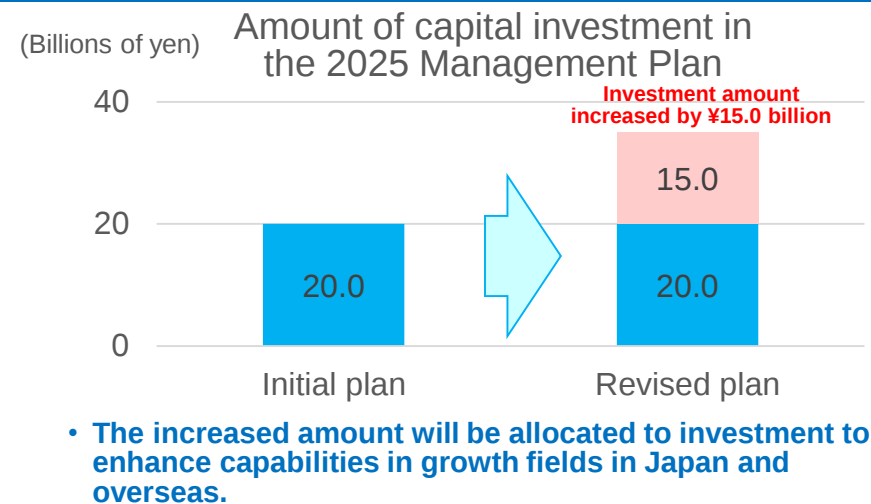
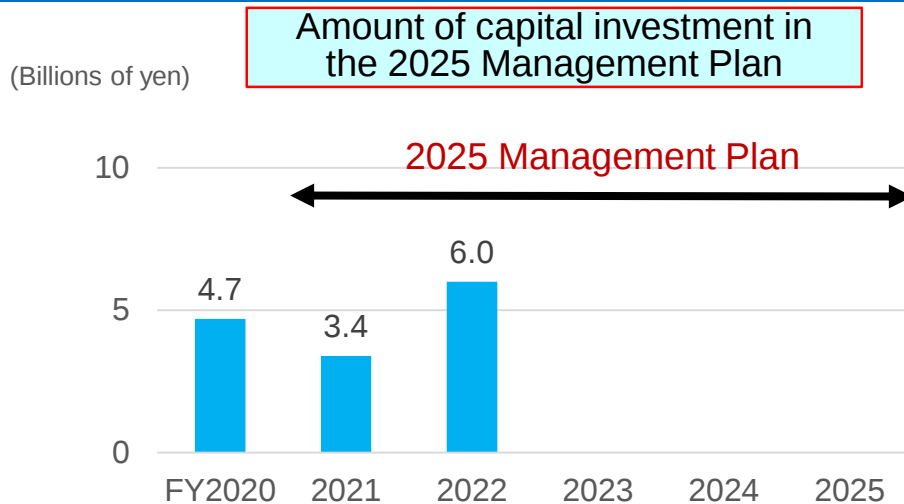
- Reinforce the quality and production technologies to receive mass-production orders in growing fields.
- Ensure timely investments to increase production capacity and the early realization of investment effects.

Increasing the earning power of the Furnace segment

- Steadily receive large-project orders and reinforce foundations for steel making and coke oven maintenance works.
- Expand sales by enhancing the capability to make proposals to domestic and international customers in the non-ferrous materials and other fields based on our high expertise in both materials and construction services.

(1) Revised 2025 Management Plan announced on July 28, 2023

Revision to the amount of capital investment



Major capital investments in FY2021–FY2022

Japan



Overseas

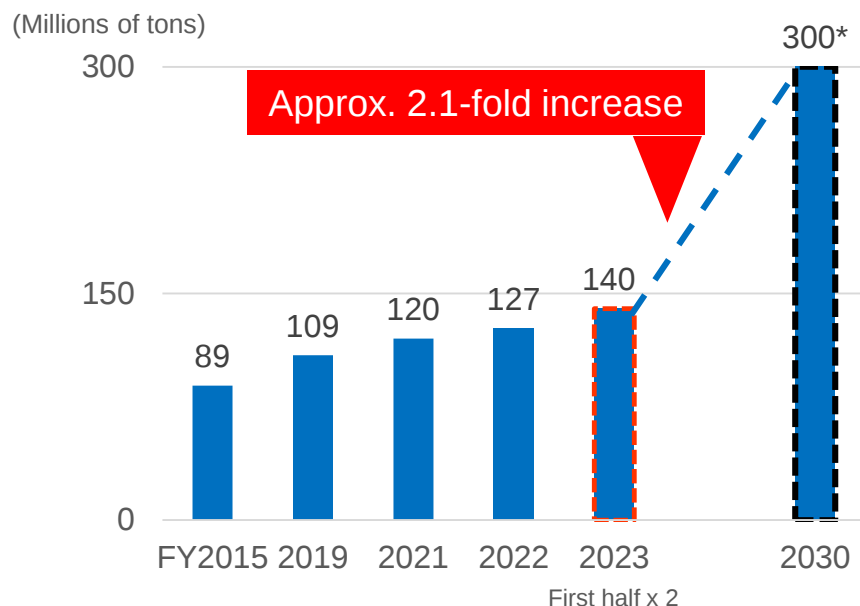


(2) Strengthen earning power and competitiveness in the Refractories segment

Enhance competitiveness in the growing Indian market

- The Indian steel market is expected to grow steadily.
- As the steel market grows, steelmakers are producing steel products that are higher in grade and wider in variety.
- Refractories they use are expected to increase in quantity and advance in the level of technological requirements. => **We anticipate that opportunities to benefit from our technologies will grow.**

Results and outlook of crude steel output in the Indian market



Major Indian steelmakers' production increase plans

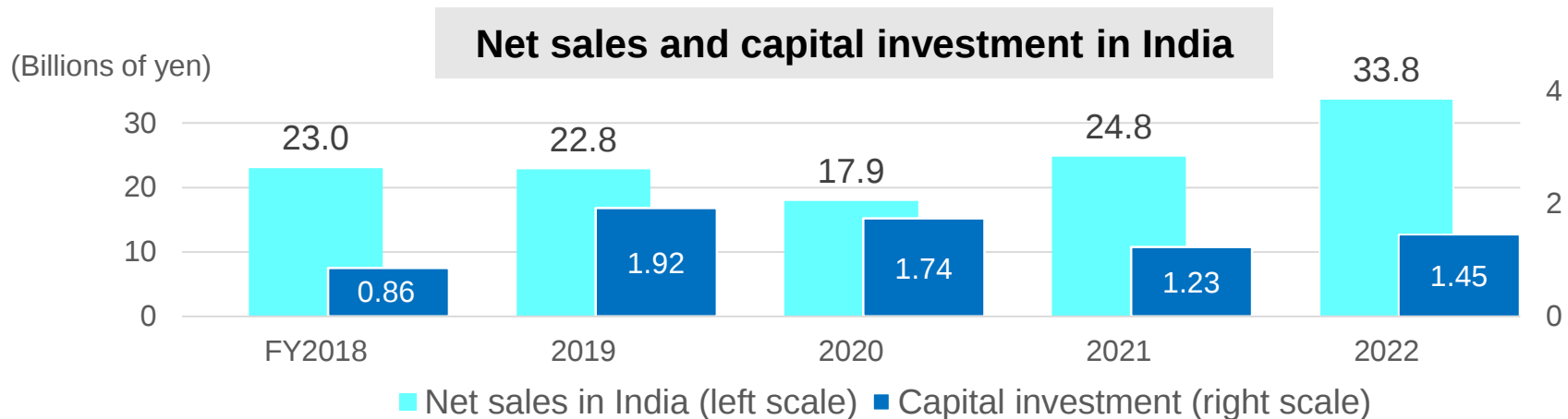
TATA	JSW	AM/NS
19.06 million tons (2021 result)	20.92 million tons (2021 result)	7.39 million tons (2021 result)
25.00 million tons (2025 plan)	37.00 million tons (2025 plan)	15.00 million tons (2026 plan)
Approx. 1.3-fold increase	Approx. 1.8-fold increase	Approx. 2.0-fold increase

*Crude steel output for 2030 targeted by the Indian government.

(2) Strengthen earning power and competitiveness in the Refractories segment

Achieve an increase in net sales by active investment in growth in India

- **TRL-K**, a company in the Group, holds a **top-class share** of the Indian market, doing business with approximately 50 steelmakers, including TATA Steel, AM/NS India, and JSW.
- It is making the **utmost use of the full-range production/sales capabilities** for refractories for steel.



New plants supporting the full range of production capabilities for TRL-K



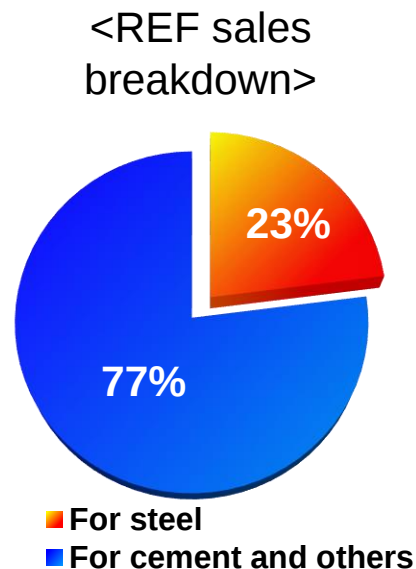
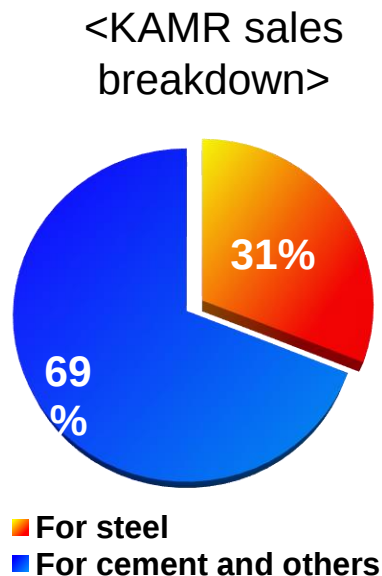
(2) Strengthen earning power and competitiveness in the Refractories segment

Leverage the effects of the business portfolio in the European market

Business portfolio in Europe

We have a business structure with strength in products for the non-ferrous materials (cement), in addition to those for the steel industry. Furthermore, there are synergistic effects from our system of providing integrated product supply and construction services, namely, to manufacture refractories and offer installation work as well.

Sales breakdowns for two European subsidiaries



REF-T overview

Company name: Refractaria Technologies, SL
(SL means limited liability company.)
Location: Spain
Established: January 19, 2012*
Business: Furnace construction
Employees: Approximately 30 temporary workers are hired as needed for each construction project.
Parent company: REF (Refractaria, S.A.)

* Resumed business as a furnace construction company on March 4, 2021.

(2) Strengthen earning power and competitiveness in the Refractories segment

Capture demand for refractories for cement manufacturers that is growing on a global scale

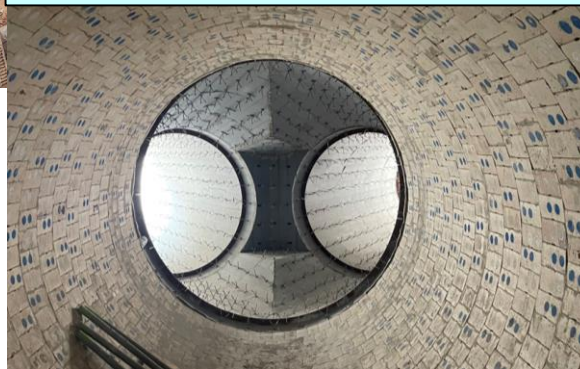
Actively sell refractories for cement manufacturers that are produced by two subsidiaries of the Company in Spain to countries outside of Europe

Due to the growth of the global population and rapid urbanization in developing countries, there is an increase in construction of housing and commercial facilities. With the increase in demand for construction, demand for cement is trending higher.

Cement kiln: Exterior



Cement kiln:
Interior using refractories



By market:

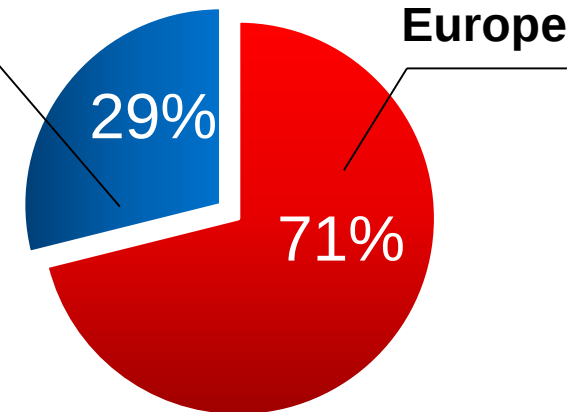
From Spain to the global market

Net sales in FY2022

KAMR + Refractaria (€128,403 thousand)

**Outside
Europe**

North
America,
Central
and South
Americas,
Middle
and Near
East,
Africa,
etc.



(2) Strengthen earning power and competitiveness in the Refractories segment

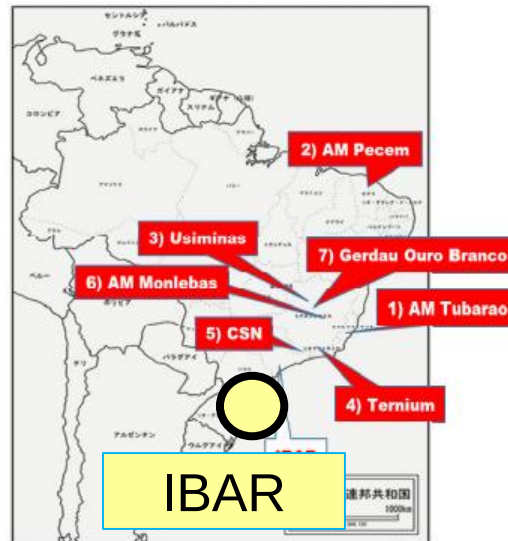
Leverage the effects of partnerships in the South American markets

Concluded a sales agency agreement in May 2020 and a refractories license agreement in October 2021 with IBAR

Securing manufacturing and sales bases for our licensed products in Brazil **has enabled us to expand our sales in the South American market**. We are held in high regard by South American steel companies for our technological expertise.

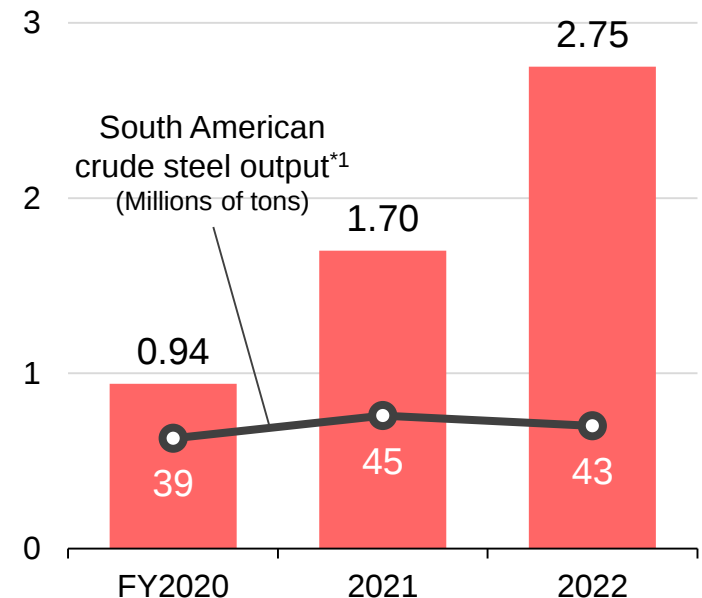
[IBAR]

- Location: Brazil
- Net sales: ¥9.5 billion (FY2020 results)
- Employees: Approx. 1,000
- Primary business: Manufacture and sale of refractories, production of raw materials for refractories



Net sales in South America

(Billions of yen)



*1: Crude steel output in the nine main South American countries.

(2) Strengthen earning power and competitiveness in the Refractories segment

Exhibited at METEC, the world's leading international trade fair for metal manufacturing and metallurgical technology

Overview of METEC

- June 12–16, 2023, at Messe Duesseldorf, Germany (held once every four years)
- Visitors: Approx. 63,000 from 114 countries
(*Total number of visitors to four specialized trade fairs, including METEC, that were held concurrently.)

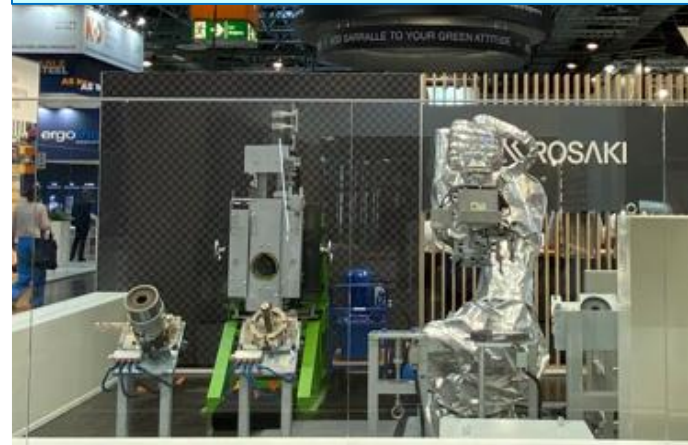
⇒ We showcased our state-of-the-art technologies and products, including display and demonstration of **REX-ROBO®**, a robot to auto-replace refractories, to highlight the technological expertise we possess.

Very well received by visitors from all over the world [Deliveries on a rise]

The Group's exhibition booth



Exhibition of **REX-ROBO®**



(2) Strengthen earning power and competitiveness in the Refractories segment

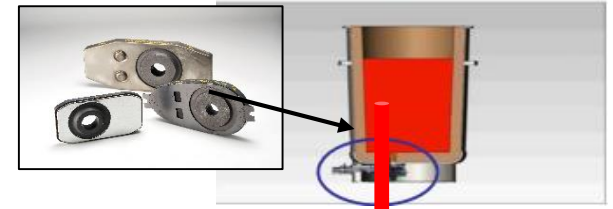
Meet customers' needs with our engineering technologies

Robotic automation of slide gate plate changing (REX-ROBO®)

- Achieved the robotic automation of the operation to change refractories (slide gate plate*) placed on the bottom of the steel ladle
 - Traditionally, this was heavy duty operations performed by human workers in a hot environment. Our engineering technologies contributed to improving safety and labor saving in these operations at customers' sites.

*Slide gate plate

A plate used to regulate the flow of molten steel. It is placed in the valve unit on the bottom of the steel ladle.



(2) Strengthen earning power and competitiveness in the Refractories segment

Turn the structural change in the domestic steelmaking processes into a growth opportunity

Challenges for the steelmaking processes in Japan

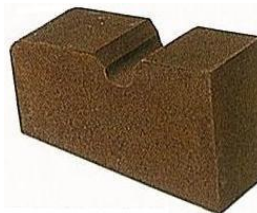
- Reducing CO₂ emissions in the blast furnace method is a challenge in the pursuit of carbon neutrality.
 - To tackle this, blast furnace manufacturers are driving structural reforms in the steelmaking processes, such as expanding the use of the electric arc furnace method.
 - Using electric arc furnace method to achieve 24-hour continuous operation (vs. traditional non-continuous operation)
 - Using electric arc furnace method to manufacture high-grade steel (vs. traditional general-purpose steel)
-
- Demand will grow for highly durable refractories for high-grade steel manufacturing.
 - These refractories are within the area where the Group has an edge with its advanced technologies.

Examples of our highly durable refractory products

Porous plugs



Magnesia-chrome
refractories



Magnesia-carbon
refractories



(2) Strengthen earning power and competitiveness in the Refractories segment

Our refractory technologies essential for high-grade steel manufacturing

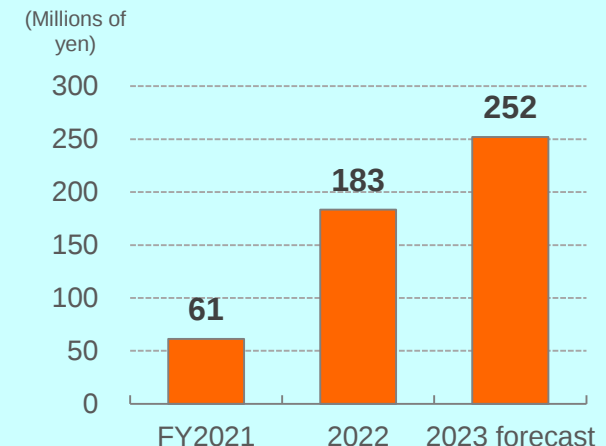
For manufacturing hybrid and electric vehicles, lightweight, durable, and workable sheet steel (= high-grade steel) is essential.

- High-grade steel manufacturing requires technologies to regulate the flow of molten steel and control inclusions during continuous casting.
- Refractories play a critical role in realizing the above technologies.

Our technology solutions

Our patents	Developed a uniquely shaped immersion nozzle for steel sheets (thin slabs) that enables a substantial reduction in drift
	Developed nozzle material for continuous casting that prevents the accumulation of impurities

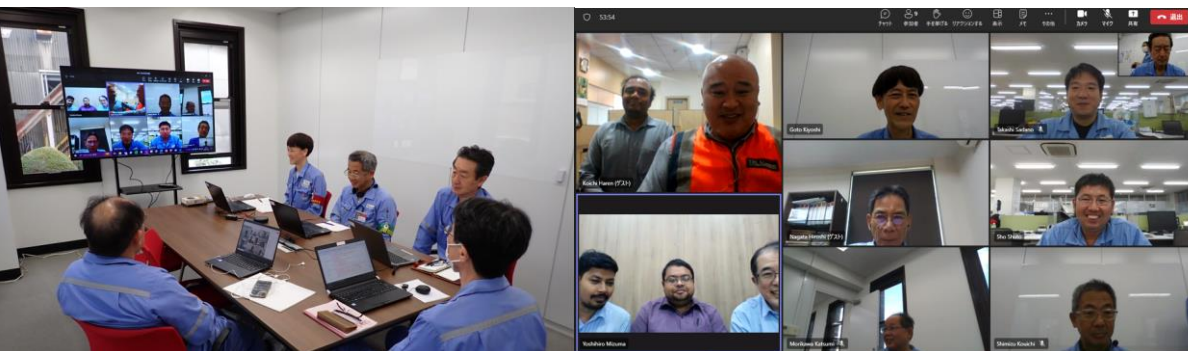
Sales of immersion nozzles for thin slabs



(2) Strengthen earning power and competitiveness in the Refractories segment

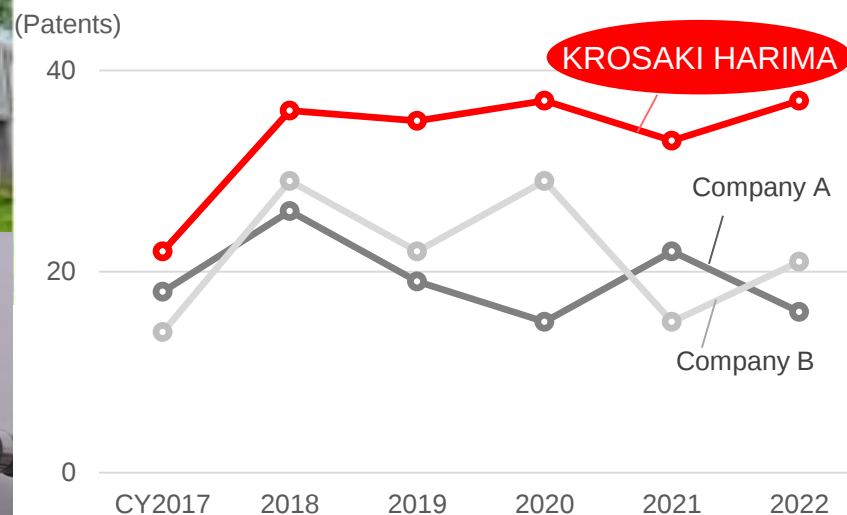
Strengthen our research-and-development system on a global scale

Timely sharing of research and development information with overseas subsidiaries



Overseas subsidiaries'
research buildings and
research equipment

Number of patents registered in Japan (comparison with competitors)



Total patents registered
(2017–2022)
KROSAKI HARIMA: 200
Company A: 116
Company B: 130

(2) Strengthen earning power and competitiveness in the Refractories segment

Implement measures to improve manufacturing capabilities and productivity

Promotion of DX: Utilization of AI at manufacturing sites

(Example of accomplishments)

- Analyzing the collected manufacturing data using AI and feeding the results back to the manufacturing sites has enabled us to forecast product quality and avoid production of defective products.

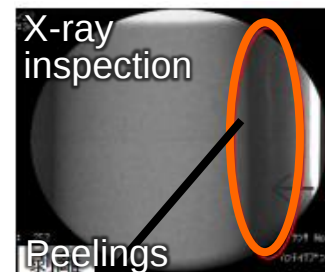
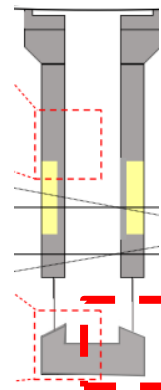


(Example of considerations)

- We are aiming to reduce the workload on inspectors and improve quality control levels by utilizing AI-based image analysis in the inspection process.

There are approx. 15 inspection items per product that are checked using X-ray, including peelings and cracks.
(Example of our AG nozzle)

AG nozzle



**Assist inspection
with AI-based
image analysis**

(3) Strengthen earning power in the Furnace segment

Continue to receive large project orders by leveraging integrated product supply and construction services and our technological superiority

Received an order for
a large-scale industrial furnace project

- There has been a rise in maintenance projects for large-scale industrial furnaces in the steel industry.
- We will steadily capture the growing furnace maintenance demand by leveraging our ability to provide integrated product supply and construction services, which is our strength, as well as our technological superiority.

[Integrated product supply and construction services]
Providing both materials (refractories) and
installation work to customers



Large-scale project orders received/expected

	FY2020	FY2021	FY2022	FY2023	FY2024 and onward
Blast furnace	NIPPON STEEL CORPORATION Muroran 2 furnaces		NIPPON STEEL CORPORATION Nagoya 3 furnaces		<u>Furnace A</u>
Hot-blast stove	NIPPON STEEL CORPORATION Nagoya No. 33		NIPPON STEEL CORPORATION Tobata No. 14	NIPPON STEEL CORPORATION Tobata No. 11	
Coke oven	NIPPON STEEL CORPORATION Nagoya 3 furnaces		NIPPON STEEL CORPORATION Kimitsu 3 furnaces NIPPON STEEL CORPORATION Oita 2 furnaces		<u>Furnace B</u>

(3) Strengthen earning power in the Furnace segment

Strengthen potential growth areas (environment and energy)

With growing expectations on biomass power generation as a renewable energy source, our business for refractories for power generation boilers remains strong, driven by robust demand for new installations.

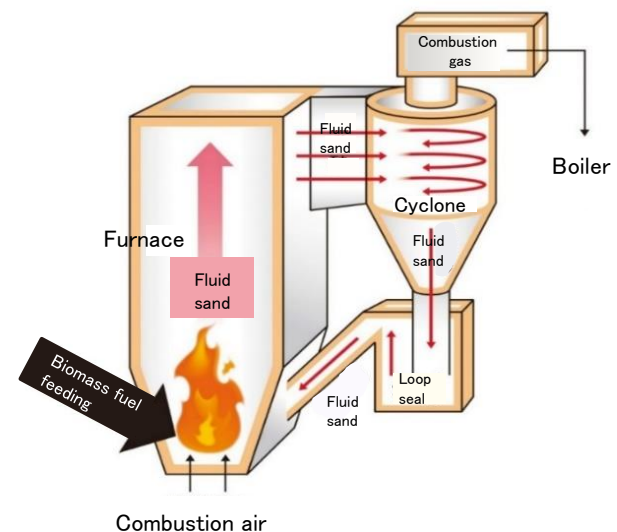
Receive orders for new projects

We will continue to actively capture demand for new installations, based on our track record of having received orders for about 40 units to date in Japan and overseas.

Receive orders for maintenance projects

Of the biomass power generation boilers ordered to us in Japan, 24 are in operation today. We have also received maintenance project orders for more than half of them and are strengthening our business foundation.

Biomass power generation boilers



(4) Strengthen earning power in the Ceramics segment

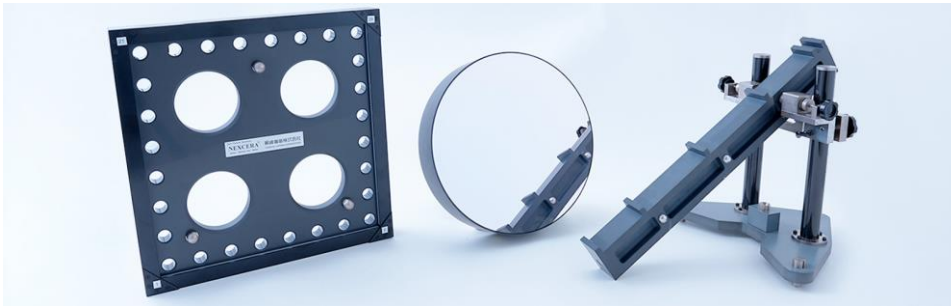
Expand fine ceramics sales in line with the growing semiconductor market

Our ceramic products are valued highly by manufacturers of semiconductor manufacturing equipment in Japan and overseas.

Reinforced quality assurance of NEXCERA[®], ultra-low thermal expansion ceramics
– Introduction of an ultra-high precision laser thermal dilatometer –

In the market for semiconductor lithography equipment, which provides core technologies in semiconductor manufacturing, there is an accelerating trend toward greater resolution, which has increased demand for NEXCERA[®], our zero-expansion products. We have introduced a high-performance thermal dilatometer, aiming to receive even more orders.

NEXCERA[®], ultra-low thermal expansion ceramics



Ultra high precision thermal expansion measurement system by laser interferometer



(4) Strengthen earning power in the Ceramics segment

Expand sales of heaters in line with the growing semiconductor materials market

Acquired UL certifications (*) in the US for our jacket heaters

Expand sales of jacket heaters for semiconductor manufacturing equipment for the US market

- Jacket heaters are used primarily for exhaust pipes, vacuum pumps, and excluding units of semiconductor manufacturing equipment. We have acquired UL certifications, which are required for sales in the U.S. market.

*UL certification is a product safety standard established by Underwriters Laboratories Inc. (UL).

Development status of our jacket heaters

- Development of small-sized products: Our expertise in design, sewing, and materials has enabled the development of products that can be used for thin and intricate pipes.
- Development of high-temperature jacket heaters: We have started to sell products that withstand highest temperatures in the industry.

Jacket heaters



(4) Strengthen earning power in the Ceramics segment

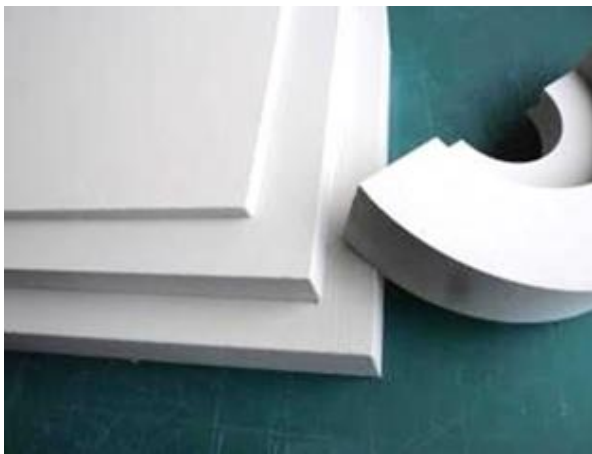
Manufacture and expand sales of a high-performance thermal insulation material that contributes to the achievement of carbon neutrality

Developed a nano-porous thermal insulation material^{*1} KROTECT[®]
Control the transfer of heat in solids, the movement of air molecules,
and the transmission of infrared

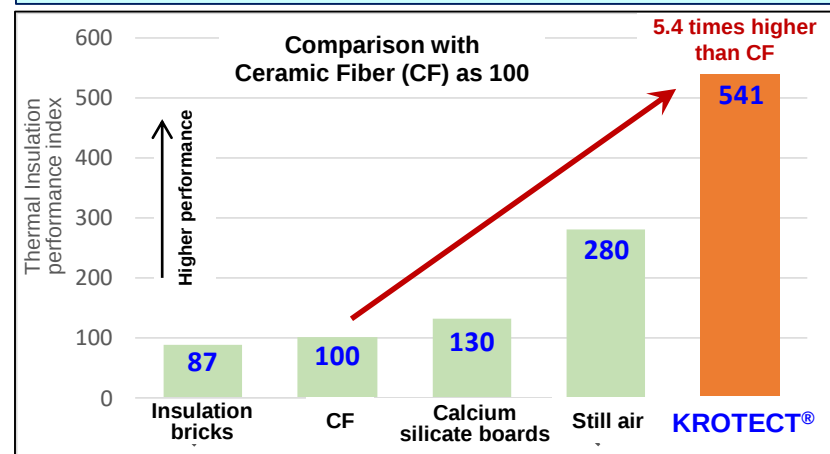
We are currently making capital investment
 aimed at expanding sales of Ene-farm residential fuel cell systems

- The Ministry of Economy, Trade and Industry is taking various measures aimed at popularizing ZEHs (net zero energy houses), which have an energy balance of zero or less, and has set a target of increasing the cumulative sales of domestic fuel cells Ene-farm to 3,000,000 units by 2030. 400,000 units have been sold so far,^{*2} and further increase in sales is expected.

Nano-porous thermal insulation material



Comparison of insulation performance with various heat-resistant insulation materials



^{*1} Heat insulation material using fumed silica (silicon dioxide particles) as its main raw material to form numerous nano-sized pores to suppress heat transfer. Its thermal conductivity is lower than that of still air and remains low even in a high temperature range.

^{*2} Source: The Advanced Cogeneration and Energy Utilization Center of Japan. Data as of June 30, 2021.

(5) Reinforce the business foundations on a company-wide basis and promote contributions to the realization of a sustainable society

Enhance safety activities

The Company's Ako Plant was awarded **the Bronze prize (the third place)** in a safety award scheme (held biennially) established in 2021 by the World Refractories Association (WRA). This remarkable achievement followed the Special Jury Award we won two years ago.

Winners of the second Safety Awards

Gold prize: Company A (India)

Silver prize: Company B (India)

Bronze prize: **The Company's Ako Plant (Japan)**



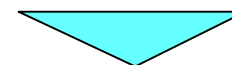
Presentation of the safety certificate to the Company's representative to win the award



2023 Bronze prize

Business sites that completed a period of five years or one million work hours with no lost time injuries and illnesses as of the end of the previous year were issued a **safety certificate**. Among these sites, the winners of the Safety Awards were chosen.

Twenty-one business sites of the members of the Japan Refractories Association were issued the **safety certificate**.



Seven business sites of the Company were presented the safety certificate. (Seven of our ten plants in Japan were certified.)

4. Initiatives to Promote Sustainability



From our basic policy on sustainability announced in December 2021

Five priority issues

In an effort to realize a sustainable society, the Group has identified 14 issues as material issues (“materiality”) in pursuing sustainability from the viewpoints of environment, society, and governance.

Specified five priority issues from the 14 material issues

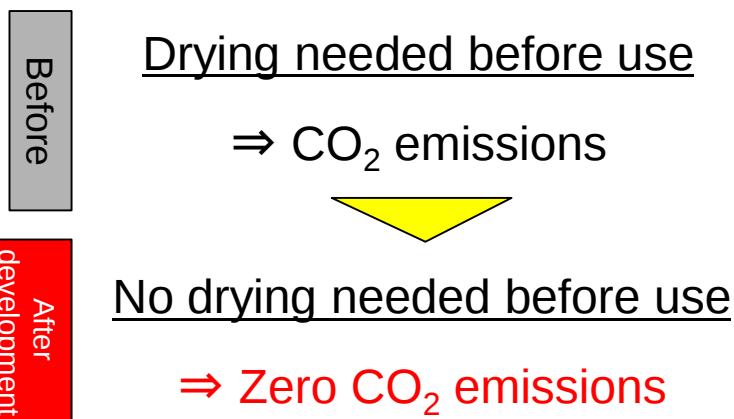


(1) Climate change measures through heat management technology

Development of new materials contributing to carbon neutrality

Development of a no-need-to-dry (Dry-Free®) gunning material

Feature: No drying needed after construction due to quick-drying properties



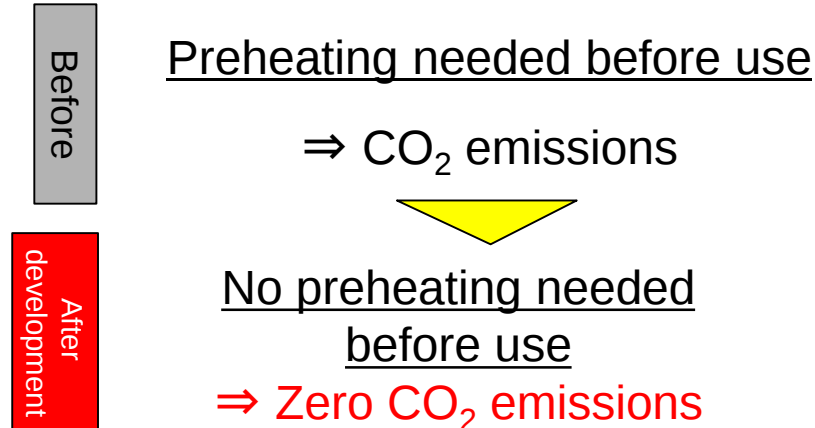
[Technological requirements]
We used to produce gunning materials by mixing unshaped refractories with cement and water, which required drying after construction. To reduce CO₂ emissions, we needed to develop alternative materials for cement and water.



→ Developed a solution binder with excellent quick-drying properties

Development of a non-preheating casting nozzle

Feature: Highly durable refractories with low risk of cracking



[Technological requirements]

Molten steel at 1500 ° C or higher passes through the nozzle for continuous casting.
To eliminate the need for preheating, technology to make the nozzle durable to sharp temperature changes is needed.



(1) Climate change measures through heat management technology

Our products (Dry-Free® Series) have been recognized by the City of Kitakyushu

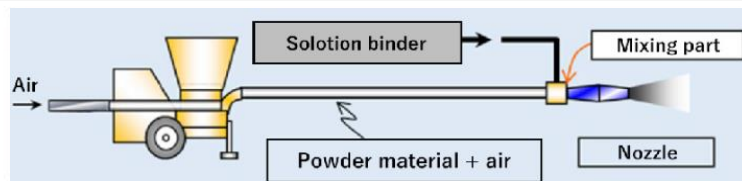
The City of Kitakyushu is pursuing an initiative in which it selects environmentally-friendly products and services contributing to the reduction of environmental impact that are produced in the city as Kitakyushu Eco Premium and broadly advertises them to support efforts to raise the profile and grow sales.

Our products (Dry-Free® Series) have been awarded the highest rating among those selected as Eco Premium and selected as **Top-notch Premium**.

Top-notch Eco Product

No-need-to-dry monolithic refractories that will contribute to the achievement of carbon neutrality and SDGs

Dry-Free® Series



Mr. Katayama, Deputy Mayor of the City of Kitakyushu (left) and Mr. Nishi, Executive Counsellor of the Company (right)

(2) Diversity and inclusion

Empowering women

Examples of initiatives

- One woman was elected as a director at the General Meeting of Shareholders held on June 29, 2022.
- We pay ¥2,000 per child per month to employees with children aged under 18 to support their child rearing.
- In FY2022, 22% of eligible men took childcare leave.
- In FY2022, 89.8% of eligible male employees took childcare-related leave.

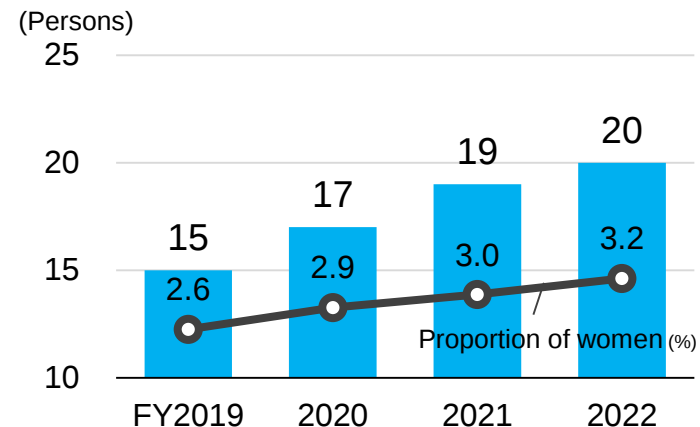
Proportion of management positions occupied by women

By 2030

Increase by 1.5 times or more

Soon after

Increase by 2 to 3 times



Target ratio of female graduates recruited to the main career track

By FY2025

20% or more

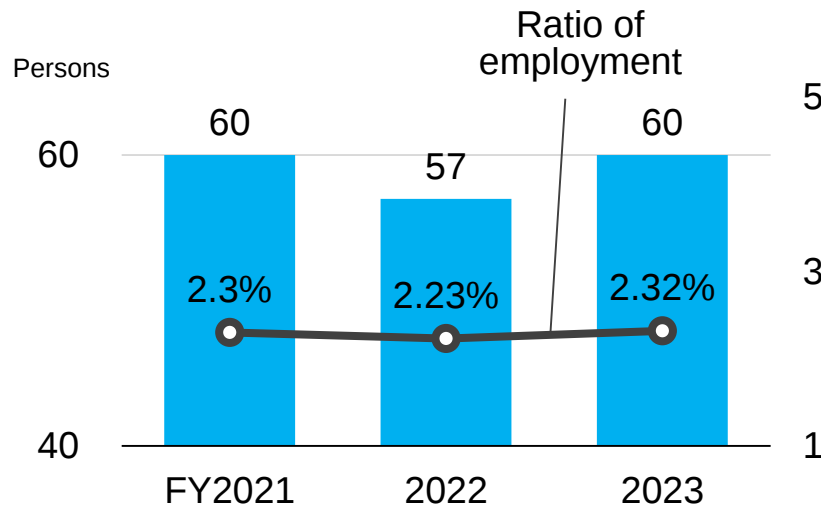
By FY2030

30% or more

(2) Diversity and inclusion

Promotion of employment of people with disabilities

Ratio of employment of people with disabilities
(For 2023, data as of September 1)



- We have cleared the current statutory employment rate of 2.3%.
- We are employing one more person than what the law mandates.

* This award is presented by Fukuoka Prefecture to individuals with disabilities who serve as role models as professional workers, with an aim of realizing a society in which both people with and without disabilities can work vibrantly.

An employee of the Company won the Fukuoka Prefecture Governor's Award for an Outstanding Worker with Disabilities in the Year of 2022*.



Mr. Hattori, Governor of Fukuoka Prefecture (left) and the Award winner (right)

(2) Diversity and inclusion

Group's global management framework

Actively appointing local employees to top positions at overseas subsidiaries
Appointing local managers to operate our overseas subsidiaries and develop sales activities focused on the local region



The Netherlands/KEB



China/KSE



China/WKM

The Netherlands

Spain



Spain/KAMR, REF



India/TRL-K

China

Shanghai

Taiwan



Japan/
KROSAKI HARIMA CORPORATION

The United States

(2) Diversity and inclusion

Global employee training

Sales representatives from overseas subsidiaries gathered in Japan to receive group training on sales.



Exchange of opinions among executives (direct contact)

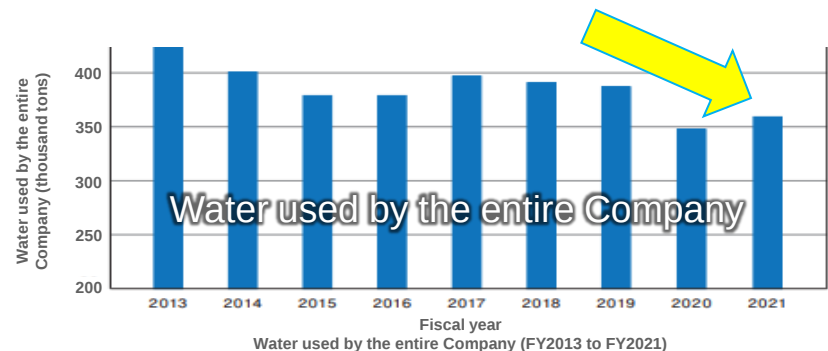


(3) Conserve the local environment (water environment, greenery environment, air pollution)

Initiatives in Japan

Industrial water recycling

We are currently pursuing a project where industrial wastewater is purified at our in-house water treatment facility, and a part of it is reused in the manufacturing process. We are aiming to increase the recycling rate.



Help the environmental with our paving bricks



We sell paving bricks (NEO SERIES) that are expected to suppress the increase in surface temperature by more than 10 ° C under the same condition in which asphalt surface temperature reaches 60 ° C.

As they inhibit the absorption of solar heat during the day, there is no heat emission at night, resulting in an effect of mitigating the heat island phenomenon. In addition, 60% of the raw materials consist of waste, such as refractory brick scraps and urban waste materials.

(3) Conserve the local environment (water environment, greenery environment, air pollution)

Initiatives at overseas subsidiaries and affiliates

Utilization of renewable energy



Purchase of green energy



Utilization of solar power

Protection of the environment



Afforestation activities



Over a period of five years, we provided 66,000 saplings to the community and planted 15,000 trees.

(4) Coexistence with the local community

Introduction of examples of our activities

Contributing to creating a livable city



Wasshoi Hyakuman Dance
About 100 employees, led by the President, participated in Wasshoi Hyakuman Summer Festival, a festival emblematic of our hometown of Kitakyushu.



Supporting reconstruction of the Tanga Market
(by donating landscaping bricks, etc.)

Developing the next-generation human resources to lead our business activities



We held a running workshop at the local elementary school.
(50 elementary school students participated.)



We participated in a running workshop at the request of the Hofu City Sports Association in Yamaguchi Prefecture, our training camp site.

(4) Coexistence with the local community

Contribution to the local community as a supporter company with a naming right

Start of the use of the nickname:
Krosaki Harima Athletic Stadium in Honjo

We have acquired the naming right for the Kitakyushu Municipal Athletic Stadium in Honjo. Through the utilization of this facility, we aim to contribute to the promotion of good health of the people in the local community and the revitalization of the local community and to raise the profile of the Company.

Agreement Overview

Right to name:

Kitakyushu Municipal Athletic Stadium in Honjo
 4-16-1, Ohiraki, Yahatanishi-ku, Kitakyushu City, Fukuoka Prefecture

Nickname:

Krosaki Harima Athletic Stadium in Honjo

Agreement period:

August 1, 2023 to July 31, 2026



We invited the Director of Citizens, Culture, and Sports Bureau of the City of Kitakyushu and held an event to inaugurate the nickname.

Mr. Inoue, Director of Citizens, Culture, and Sports Bureau of the City of Kitakyushu (right), and Mr. Takeshita, Director and Managing Corporate Officer of the Company (left).

(4) Coexistence with the local community

Achievements of our track and field club

**Our track and field club wins its second victory in a row
(two consecutive victories)**

at the 60th Kyushu Business Group Mainichi Ekiden (held on November 3)

We have already qualified to run the New Year Ekiden
for the 13 consecutive years and for the 36th times!



**Group photo taken at Krosaki Harima
Athletic Stadium in Honjo, the starting and
finishing point of the Mainichi Ekiden.**

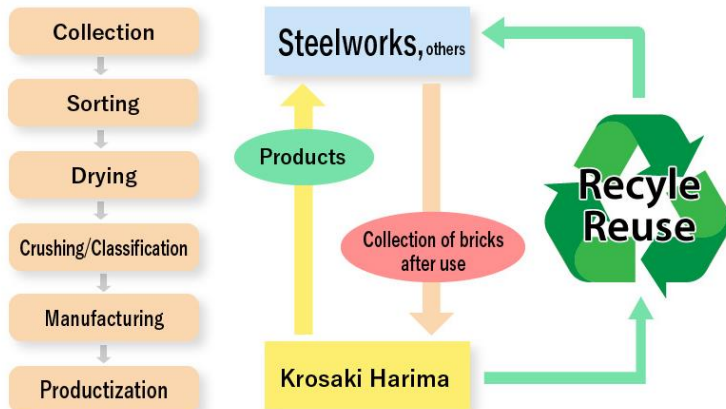


(5) Promotion of recycling

Promote recycling in Japan and overseas

Example of initiatives in Japan

Increasing the recycling ratio (10%) in the Refractories segment.



In addition to our ongoing recycling efforts within individual business segments, we are exploring and encouraging company-wide, cross-segmental recycling initiatives.

We are currently considering converting the waste materials generated in the Ceramics segment into raw materials to be used in the Refractories segment.



Example of initiatives at an overseas subsidiary

Example of initiatives at a subsidiary in India

- Comply with all environmental regulations
- Fully equip multiple locations in the premise with treatment facilities
- Utilize cutting-edge treatment technologies
- Collect and reuse 100% of brick scraps and other waste generated in the manufacturing process



Recycling ratio
per ton of refractories
in the past year

16.1%
Record high

Ratio of increase in
use of recycled
material in the past
five years

83%

[Reference] Overview of the Company

Company name:	KROSAKI HARIMA CORPORATION
Share capital	5,537 million yen
Founding	October 14, 1918
Establishment	June 1, 1919
Main business	Manufacture and sale of refractories
Number of employees	Consolidated, 4,770; non-consolidated, 2,402
Number of consolidated subsidiaries ^{*1}	13 (3 in Japan, 10 overseas)

^{*1} Including companies accounted for by the equity method.

1919	Established as KUROSAKI REFRACTORIES CO., LTD. (in what is now Yahatanishi-ku, Kitakyushu City, Fukuoka)
1949	Listed on the Tokyo Stock Exchange
1956	Capital participation from Yawata Iron & Steel Co., Ltd (presently NIPPON STEEL CORPORATION)
2000	Merged with Harima Ceramic Co., Ltd. and changed the name to KROSAKI HARIMA CORPORATION
2002	Made Kyushu Refractories Co., Ltd. a subsidiary (merged in 2012)
2011	Made TATA REFRACTORIES LIMITED (presently TRL KROSAKI REFRACTORIES LIMITED) in India a subsidiary
2019	Became a consolidated subsidiary of NIPPON STEEL CORPORATION (April) 100th anniversary of establishment (June 1)
2021	Business integration of KROSAKI HARIMA CERA CORPORATION (April) Business integration of Ariake Materials Co., Ltd. (October)

Refractories-related businesses (refractories + furnaces) account for at least 90%



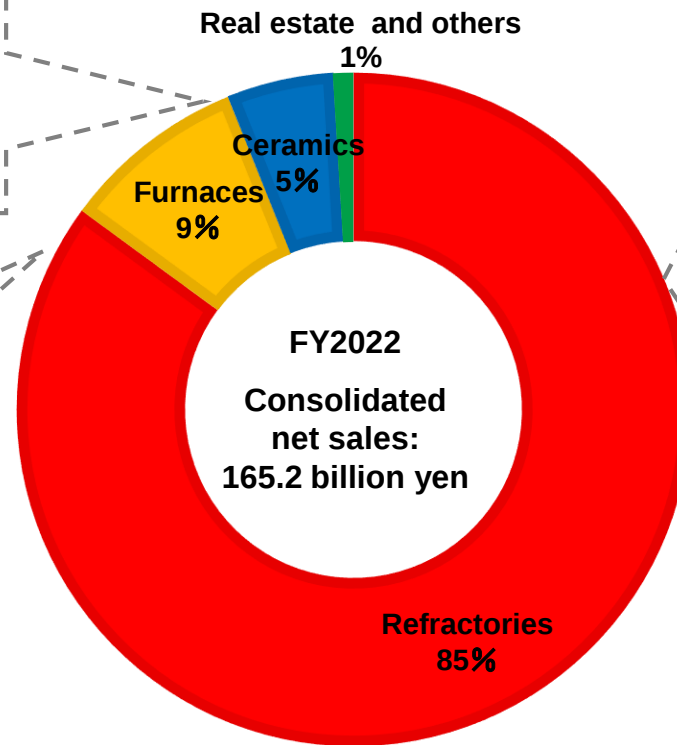
Standards for the calibration of precision measurement devices



Components for electronic component firing



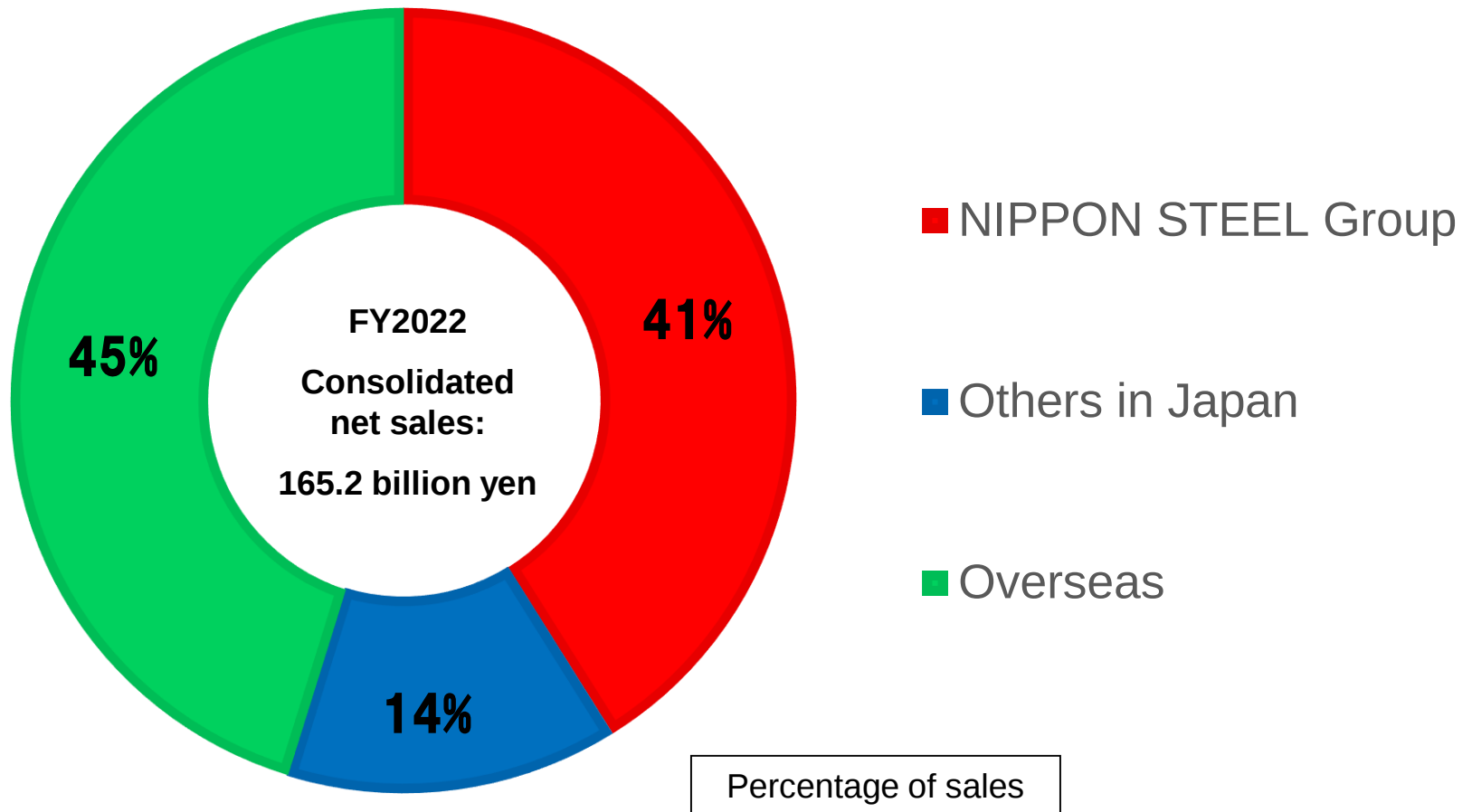
Example of construction work: pusher type billet continuous hot rolling heating furnace



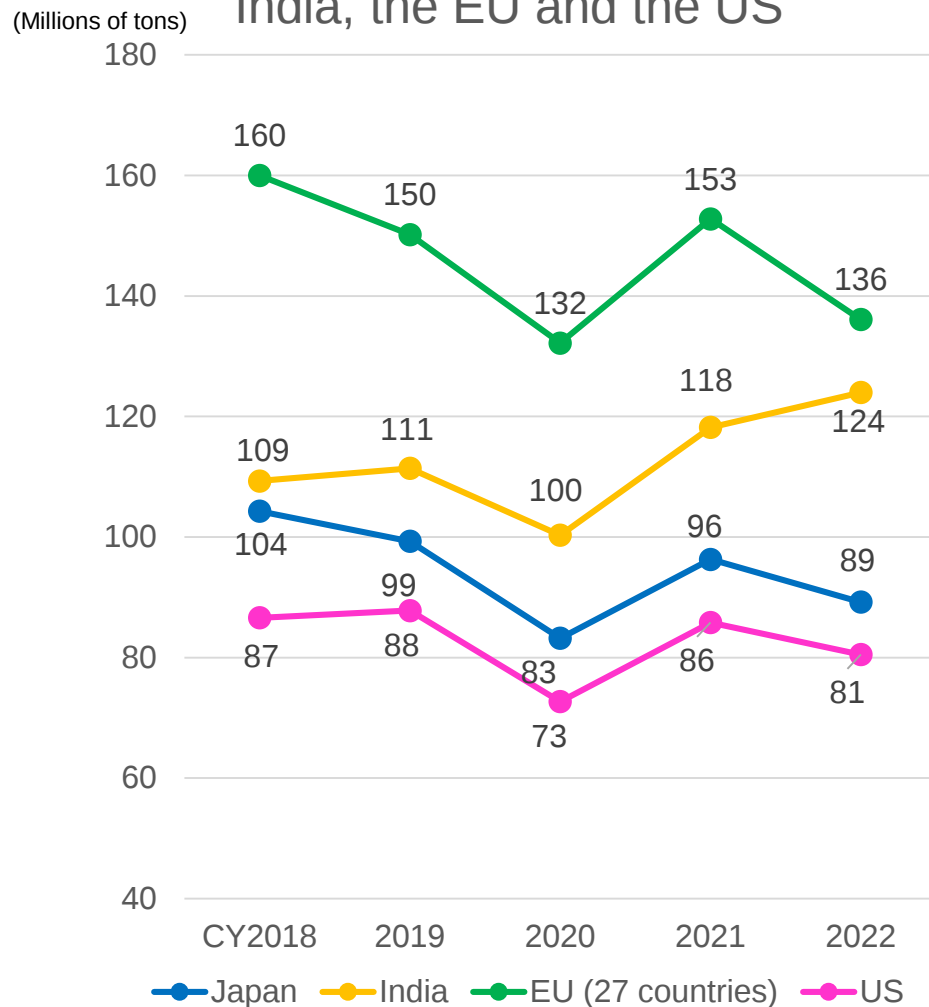
Percentage of sales



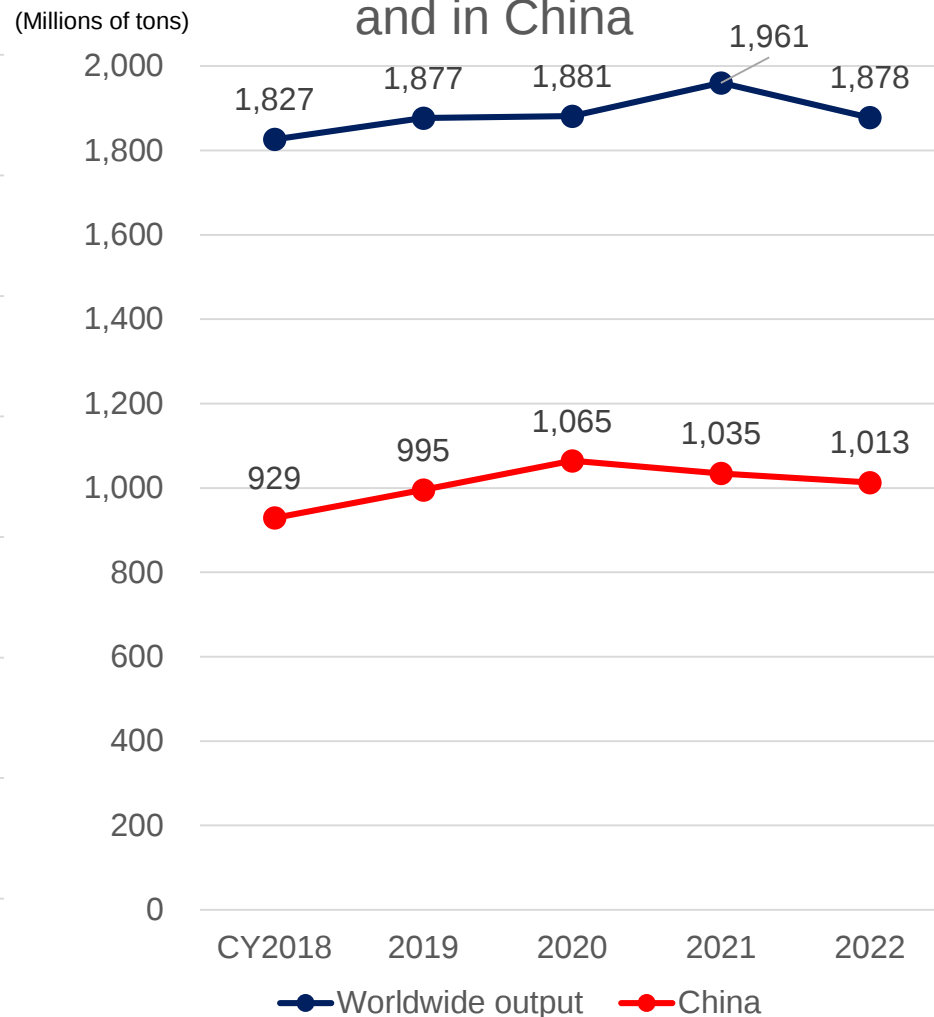
Refractories



Crude steel output in Japan, India, the EU and the US



Crude steel output worldwide and in China



<Steelmaking process>



Coke ovens /
hot-blast
stoves

Life of refractories
Approx. 40 to 50 years



Coke oven refractories



Blast
furnaces

Life of refractories
Approx. 20 years



High alumina
refractories for
blast furnaces



Torpedo
ladles

Life of refractories
Approx. 3 to 4 months



Al₂O₃-SiC-C refractories for torpedo
ladles



Converters

Life of refractories
Approx. 3 to 4 months



Magnesia-carbon
refractories for oxygen
converters



Direct-bonding
magnesia-chrome
refractories for degassing furnaces



Secondary
refining
furnaces

Life of refractories
<Upper part> Approx. 1 year
<Lower part> Approx. 1 month



Unshaped refractories for converter blowing
(The blowing is shown in the photograph above)



Gas bubbling
plugs



AG tubes for
continuous
casting



Steel ladles / continuous
casting equipment

Life of refractories
Replaced every day or
every few days

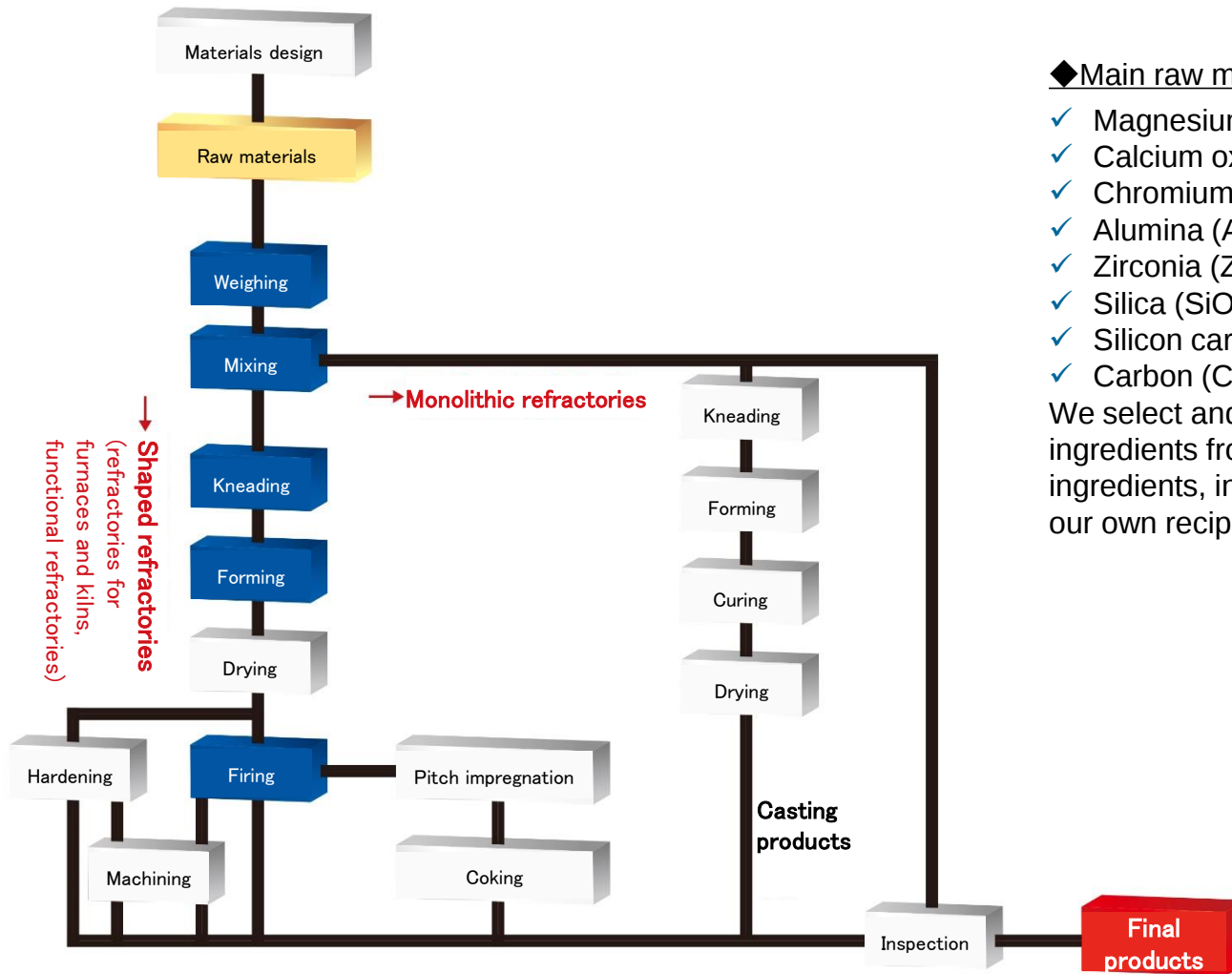


Slide gate plate operating
device



Slide gate plates
for continuous
casting

Type of refractory	Refractories for furnaces and kilns 	Functional refractories			monolithic refractories	
		AG nozzles 	SN nozzles and plates for continuous casting 	Gas babbling plugs 	Repair materials / casting materials 	Mud materials 
Main steelmaking equipment and facilities	Blast furnaces, hot-blast stoves, coke ovens, torpedo ladles, converters, secondary refining furnaces	Continuous casting equipment	Continuous casting equipment	Steel ladles	Blast furnaces, converters, steel ladles	Blast furnaces
Applications (functions)	Inner lining of equipment	Regulating the flow of molten steel	Controlling the flow of molten steel	Agitating the molten steel	Repairs and inner lining of equipment	Blocking blast furnace tap holes
The KROSAKI HARIMA Group's main production bases	•Japan •China •Spain •India	•Japan •China •India	•Japan •Spain •India •China	•Japan •India •China	•Japan •China •India •Spain	•Japan •India
The KROSAKI HARIMA Group's main markets	•Japan •Asia •Europe •North America •India •South America •China	•Japan •Asia •Europe •North America •Australia •China •India	•Japan •Asia •Europe •North America •Australia •China •India	•Japan •Europe •North America •Asia	•Japan •India •Asia •Australia •North America •Europe	•Japan •Asia •North America •Australia •India



◆ Main raw materials used in refractories ◆

- ✓ Magnesium oxide (MgO)
- ✓ Calcium oxide (CaO)
- ✓ Chromium oxide (Cr₂O₃)
- ✓ Alumina (Al₂O₃)
- ✓ Zirconia (ZrO₂)
- ✓ Silica (SiO₂)
- ✓ Silicon carbide (SiC)
- ✓ Carbon (C), etc.

We select and combine the optimal ingredients from over 1,000 types of ingredients, including particle size, to create our own recipes.

Upkeep and maintenance

We undertake the construction, repair and maintenance of refractories in equipment at steel mills, cement plants, and other facilities.



Refractories work in a coke oven



Refractories work inside a rotary cement kiln

Design and construction of industrial furnaces (heating furnaces, environmental industry furnaces, etc.)

We mainly engage in the design and construction of industrial furnaces (heating furnaces, incinerators, power generation boilers, etc.). We also design and construct only the locations where refractories are used, and provide engineering for ancillary machinery and equipment.

We also contribute to addressing energy and environmental problems by achieving energy savings.



Exterior of a walking beam furnace (heating furnace)



Refractories work inside a heating furnace

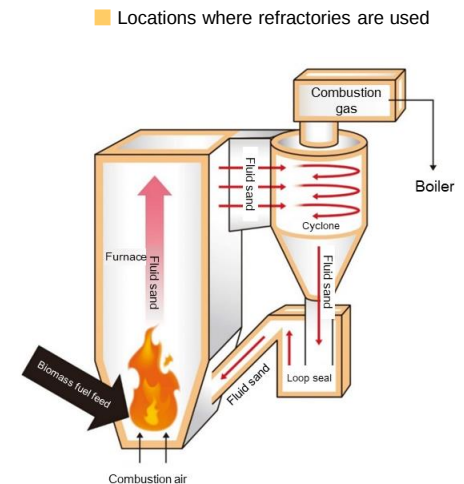
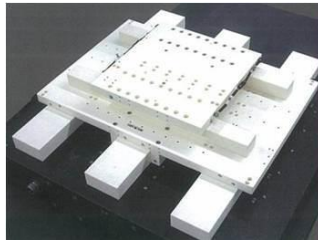


Illustration of a biomass power generation boiler

Contributing to constant performance enhancement for our customers

● Ceramics for precision components

- Semiconductor manufacturing equipment, measurement devices, and optical devices



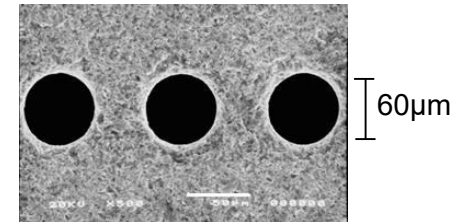
Fine ceramics for applications such as precision machinery and semiconductor manufacturing equipment, utilizing our strengths in large-sized and precision processing, as well as assembly techniques.



We have begun to utilize the outstanding dimensional stability and environmental robustness of NEXCERA™ zero-expansion ceramics in applications such as standards and corrections for precision measuring devices.

● Machinable ceramics

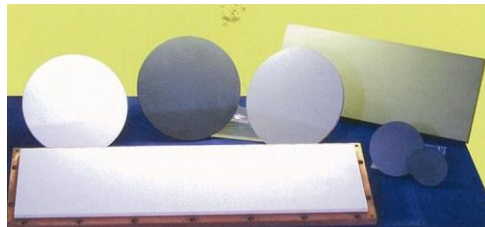
- Electronic component manufacturing, industrial machinery, and semiconductor manufacturing



Our machinable ceramics can be processed in the same way as metals, achieving precision processing on the scale of microns. The photograph shows a Macerite HSP probe card (an IC chip inspection jig formed on a silicon wafer) drilled with tiny holes (60μm in diameter).

● Sputtering target materials

- Electronic components and semiconductor devices



High-purity ceramic sputtering target materials that form a film to protect electronic components and semiconductor devices from heat and abrasion. Used in applications such as thermal printer heads.

● Components for electronic component firing

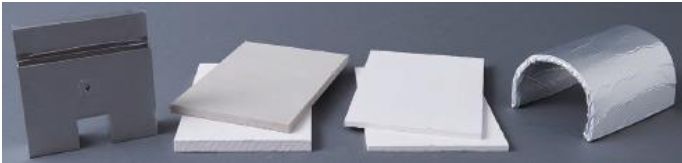
- Electronic component manufacturing



Indispensable components, mainly for ceramic electronic component firing. We boast the No. 1 market share globally in the ceramic capacitor field.

Contributing to society in the fields of energy saving and environment

- High-performance thermal insulation materials
 - Steel and non-ferrous metals manufacturing, various industrial furnaces, aircrafts, automobiles



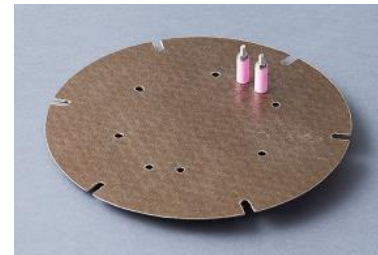
We utilize the thermal insulation characteristics of these products, which provide better thermal insulation than still air and are markedly superior to existing insulation materials, to contribute to saving energy and improving productivity through thinner, smaller, and lighter components.

- High-performance thermal storage materials
 - Regenerative heaters



Our ceramic materials with outstanding thermal storage features are used for applications such as regenerative heaters and underfloor heaters. They contribute to the effective use of electrical energy through nighttime power usage.

- Heaters
 - Liquid crystal manufacturing, semiconductor manufacturing, high-performance heater units



Our slim, flat heaters are notable for their excellent heat uniformity and heat responsiveness. They contribute to enhancing productivity in a wide range of industrial fields. We can respond to customer needs from design onward and provide heaters of various sizes.

- Eco-construction materials
 - Construction materials such as bricks for paving and external walls



Our construction materials serve environmental functions such as permeability and water retention, and feature both texture and design. They contribute to creating recycling cities through technologies using raw materials recycled from urban construction materials.



<https://www.krosaki.co.jp/en>

These materials are not disclosure materials designated under the Financial Instruments and Exchange Act, and we do not guarantee the accuracy or completeness of the information presented herein.

Moreover, the forward-looking statements presented in these materials represent the views of the Company based on the information available at the time when the materials were prepared, and involve uncertainties.

Therefore, we request that users refrain from depending solely on these materials when making investment decisions.

The Company shall take no responsibility for any losses that may occur as a result of using these materials.