



Financial Results Briefing for the Fiscal Year Ended March 2023

May 26, 2023

KROSAKI HARIMA CORPORATION

(Securities Code: 5352)

1. Overview of Financial Results
for the Fiscal Year Ended March 2023

2. The Group's Business Portfolio and
Progress on the 2025 Management Plan

3. Initiatives to Promote Sustainability

[Reference] Overview of the Company



Overview of Financial Results for the Fiscal Year Ended March 2023 (FY2022)

Overview of Business Results

(Billions of yen)

	FY2021	FY2022	Year-on-year change	
Net sales	133.77	165.20	+ 31.43	+ 23.5%
Operating profit	7.56	11.17	+ 3.61	+ 47.7%
Ordinary profit	8.67	12.08	+ 3.41	+ 39.2%
Profit ^{*1}	5.49	8.28	+ 2.79	+ 50.8%
ROS ^{*2}	6.5%	7.3%	+ 0.8pt	
ROE ^{*3}	8.8%	11.9%	+ 3.1pt	

Record highs in net sales and profit

Business Environment

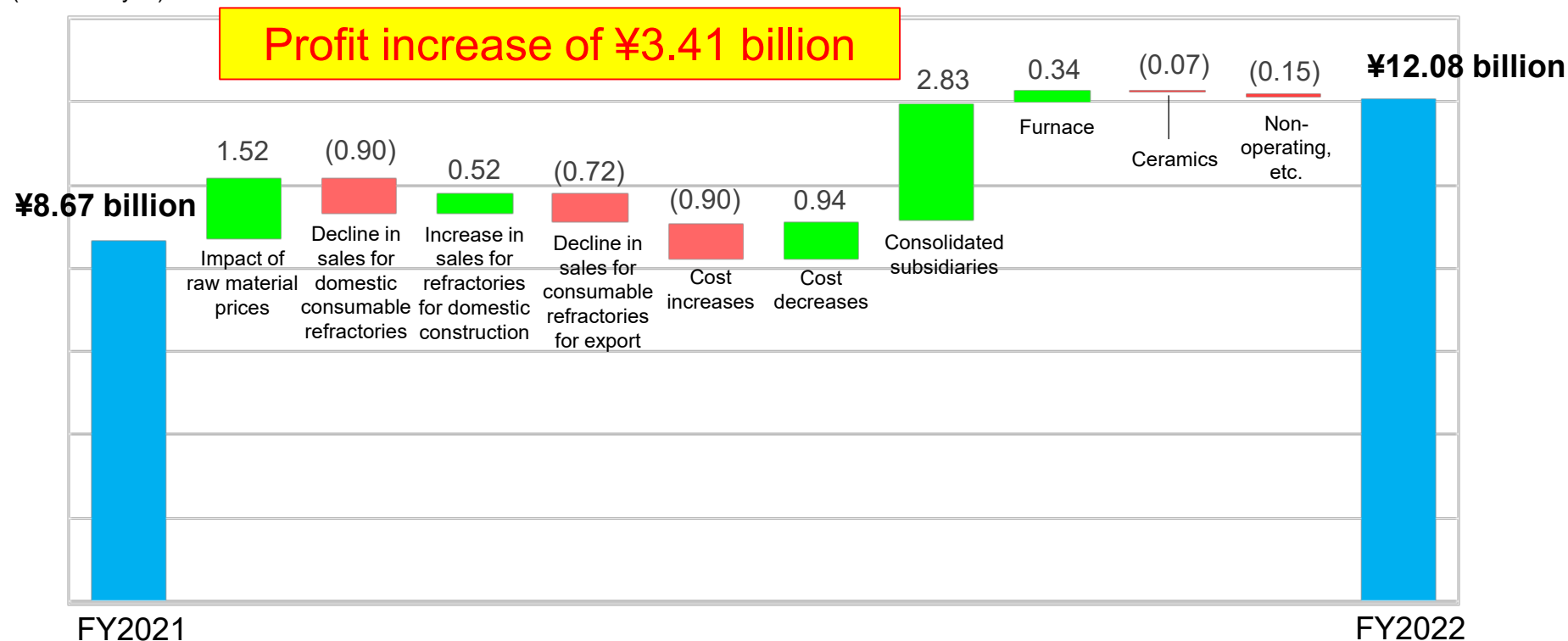
- Domestic total crude steel output (FY2022): 87.85 million tons (down 8.1% year on year)
- Worldwide crude steel output (CY2022): 1,878.50 million tons (down 4.2% year on year)
- Total crude steel output in India (CY2022): 124.70 million tons (up 5.5% year on year)

*1: Profit attributable to owners of parent *2: Return on sales (ordinary profit to net sales ratio) *3: Return on equity

Analysis of Factors Causing Change in Ordinary Profit [FY2021 vs. FY2022] (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, progress in passing on the rise in costs to selling prices offset the negative impacts. On the other hand, strong business performance continued in overseas subsidiaries, mainly in India and Europe, resulting in a year-on-year increase in profit of ¥3.41 billion on a consolidated basis. The Group achieved a record high profit.

(Billions of yen)



Financial Position (Consolidated)

<Balance Sheets>

(Billions of yen)

		March 31, 2022	March 31, 2023	Change	Main factors
Assets		142.69	163.34	+ 20.65	-
Current assets		91.32	108.22	+ 16.90	Increase in accounts receivable due to increase in sales
Property, plant and equipment and intangible assets		41.11	43.67	+ 2.56	Acquisition of buildings, machinery and equipment
Investments and other assets		10.25	11.43	+ 1.18	-
Liabilities		73.60	85.48	+ 11.88	Increase in interest-bearing liabilities due to increase in working capital
Net assets		69.08	77.85	+ 8.77	Increase in retained earnings

Balance of interest-bearing liabilities		34.19	39.38	+ 5.19
D/E ratio		0.52	0.54	+ 0.02
Equity ratio		45.8%	45.0%	- 0.8pt

<Cash Flows>

		FY2021	FY2022	Main factors
Cash flows from operating activities		4.22	1.00	Increase in working capital due to the increase in sales
Cash flows from investing activities		(3.61)	(4.51)	Progress of capital investment
Free cash flow		0.51	(3.51)	-
Cash flows from financing activities		(1.02)	2.86	Increase in borrowings due to increase in working capital

Business Results by Segment (Consolidated)

(Billions of yen)

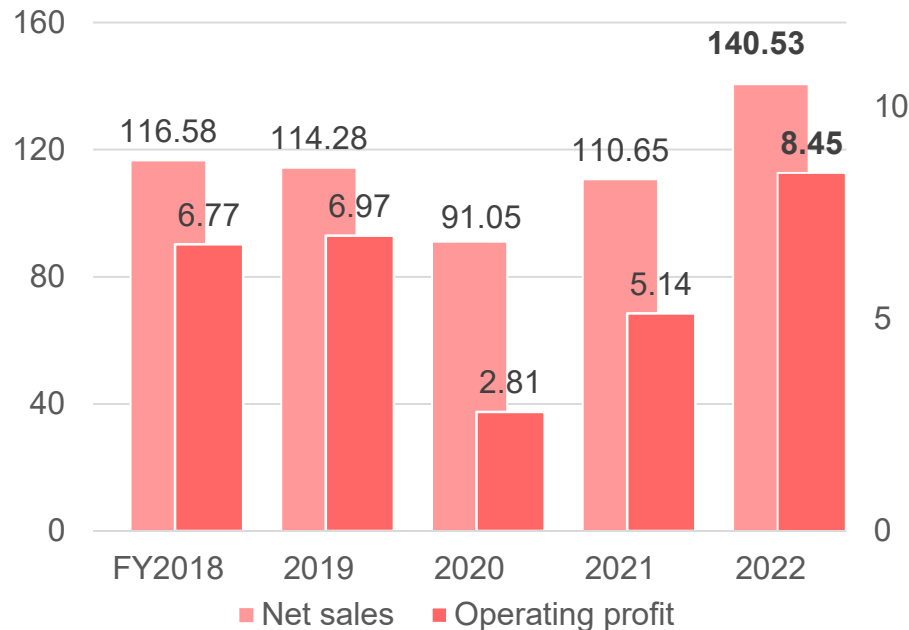
		FY2021	FY2022	Year-on-year change	
Refractories	Net sales	110.65	140.53	+ 29.88	+ 27.0%
	Segment profit	5.14	8.45	+ 3.31	+ 64.2%
Furnace	Net sales	13.22	14.62	+ 1.40	+ 10.6%
	Segment profit	0.66	1.00	+ 0.34	+ 51.1%
Ceramics	Net sales	8.48	8.47	- 0.01	- 0.2%
	Segment profit	1.12	1.06	- 0.06	- 5.5%
Real estate and others	Net sales	1.40	1.56	+ 0.16	+ 11.4%
	Segment profit	0.62	0.63	+ 0.01	+ 1.6%
Total	Net sales	133.77	165.20	+ 31.47	+ 23.5%
	Segment profit	7.56	11.17	+ 3.61	+ 47.7%

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)

	FY2021	FY2022	Year-on-year change	
Net sales	110.65	140.53	+ 29.88	+ 27.0%
Operating profit	5.14	8.45	+ 3.31	+ 64.2%



Review

- We achieved a 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 metals fields, mainly in Europe, in addition to steady efforts to pass on the rising price of raw material and other cost increases in Japan and overseas to selling prices.

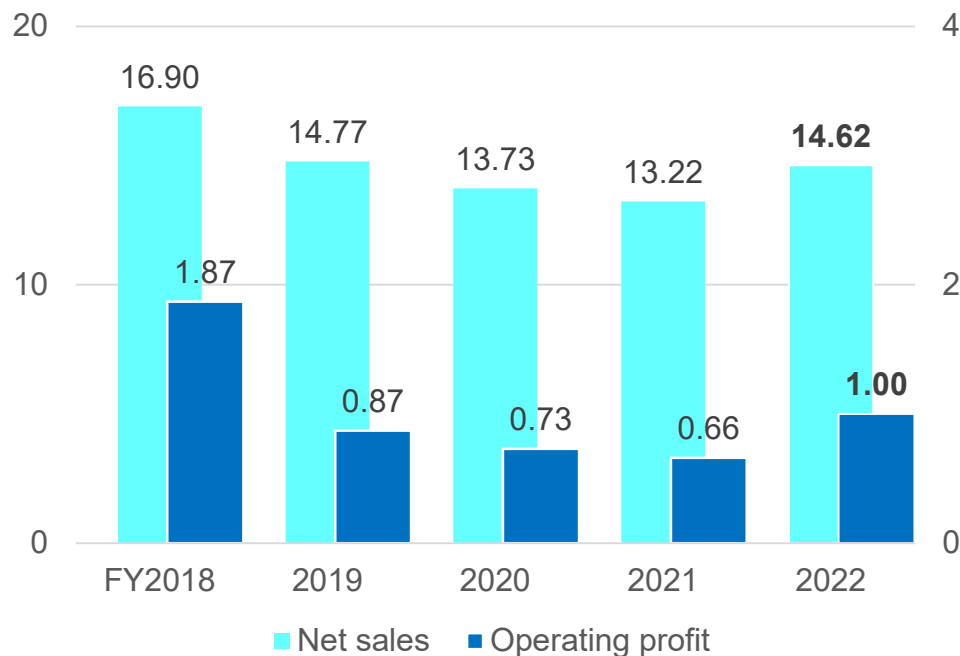
Initiatives for the Future

- 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.
- Overseas, make utmost use of the full-range production/sales capabilities established in the Indian market and further increase our production capacity, while capturing demand, including in non-ferrous metals fields, through deeper cooperation by the Company's manufacturing bases with alliance partner companies in Europe and the United States, aiming to further expand businesses.

Business Results

(Billions of yen)

	FY2021	FY2022	Year-on-year change	
Net sales	13.22	14.62	+ 1.40	+ 10.6%
Operating profit	0.66	1.00	+ 0.34	+ 51.1%



Review

- Sales and profit both increased due to orders received for large-scale construction projects, including those for biomass power generation boilers, and a reduction in costs due partly to personnel optimization in maintenance work for steel facilities, despite reduced orders for steel facility maintenance work due to a decline in crude steel output.

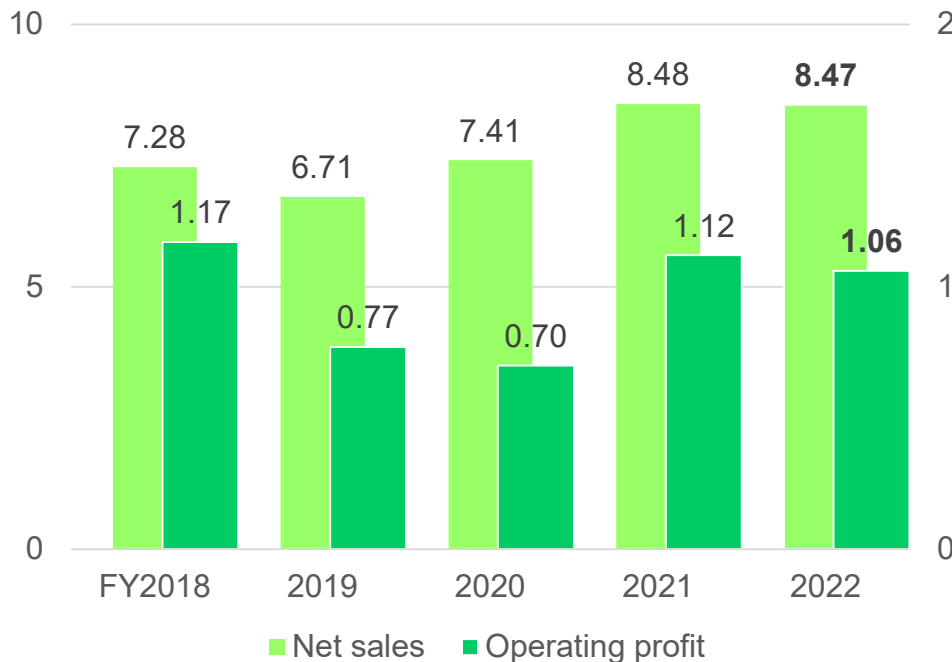
Initiatives for the Future

- 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 metals 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)

	FY2021	FY2022	Year-on-year change	
Net sales	8.48	8.47	- 0.01	- 0.2%
Operating profit	1.12	1.06	- 0.06	- 5.5%



Review

- Sales and profit both decreased due to a decline in orders received for the Company's thermal insulation materials resulting from a decrease in production due mainly to customer-side components procurement issues owing to the impact of lockdowns in China in the first half of FY2022, followed by a decline in orders received for ceramic materials for electronic components due to supply and demand adjustments by customers.

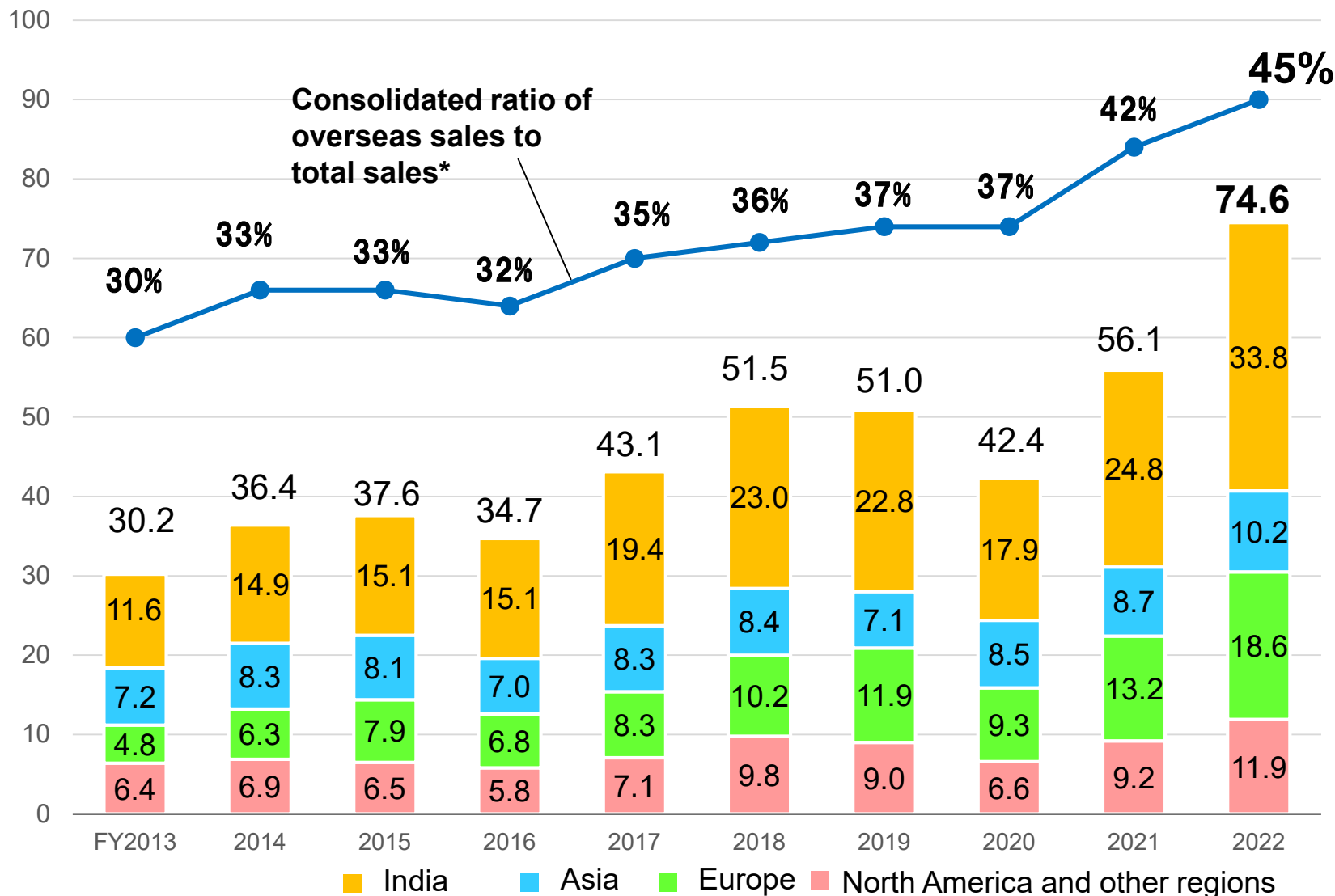
Initiatives for the Future

- The global value of semiconductor manufacturing equipment sales in 2022 reached a record high* for the third consecutive year. Negative growth is forecast in the semiconductor market in 2023, but we will steadily capture the increasing demand for ceramic materials resulting from medium- to long-term market expansion.
- We will further grow revenue by driving sales expansion in each field, including thermal insulation materials for the environment field and products for new fields such as aerospace and healthcare.

*According to Semiconductor Equipment and Materials International (SEMI), global sales of semiconductor manufacturing equipment increased by 5% in 2022 from the previous year to a record high of \$107.6 billion.

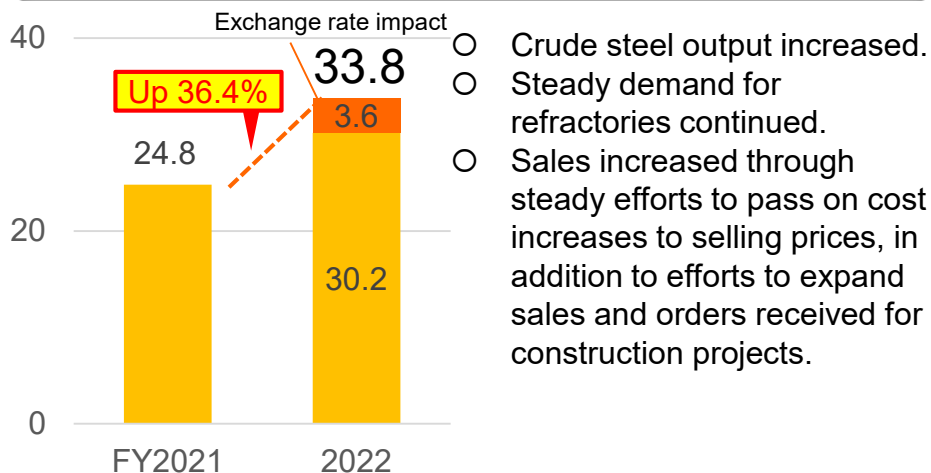
Consolidated Overseas Net Sales (in Japanese Yen)

(Billions of yen)

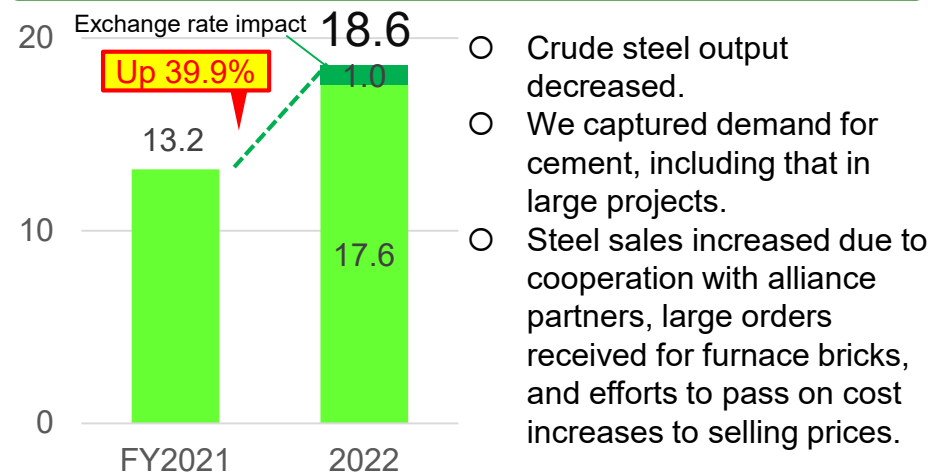


*Percentages are rounded to the nearest whole number.

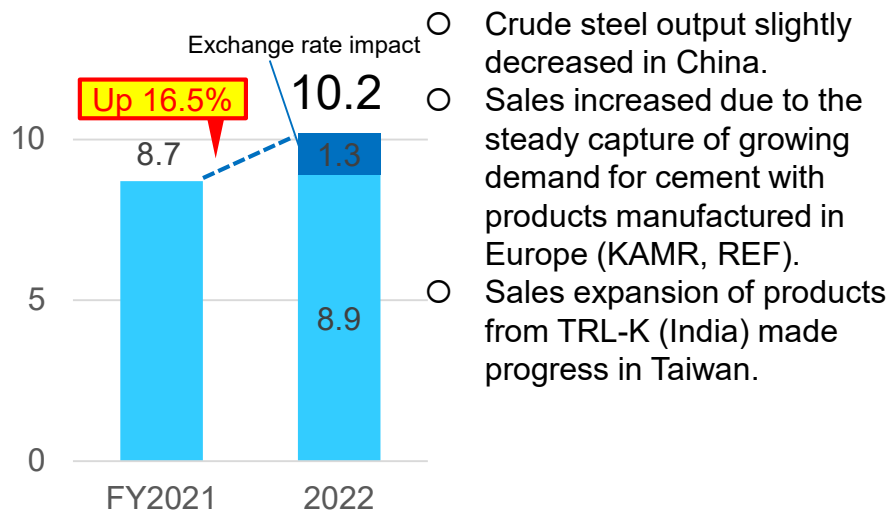
India



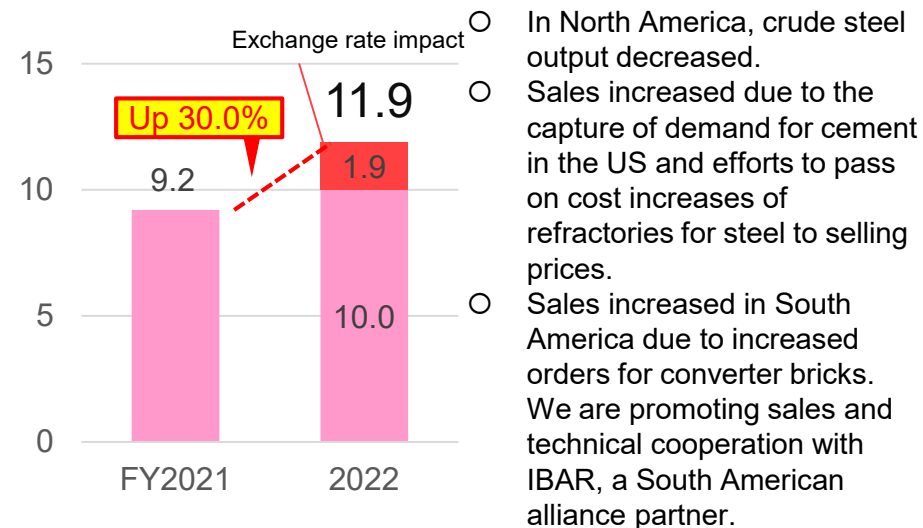
Europe



Asia



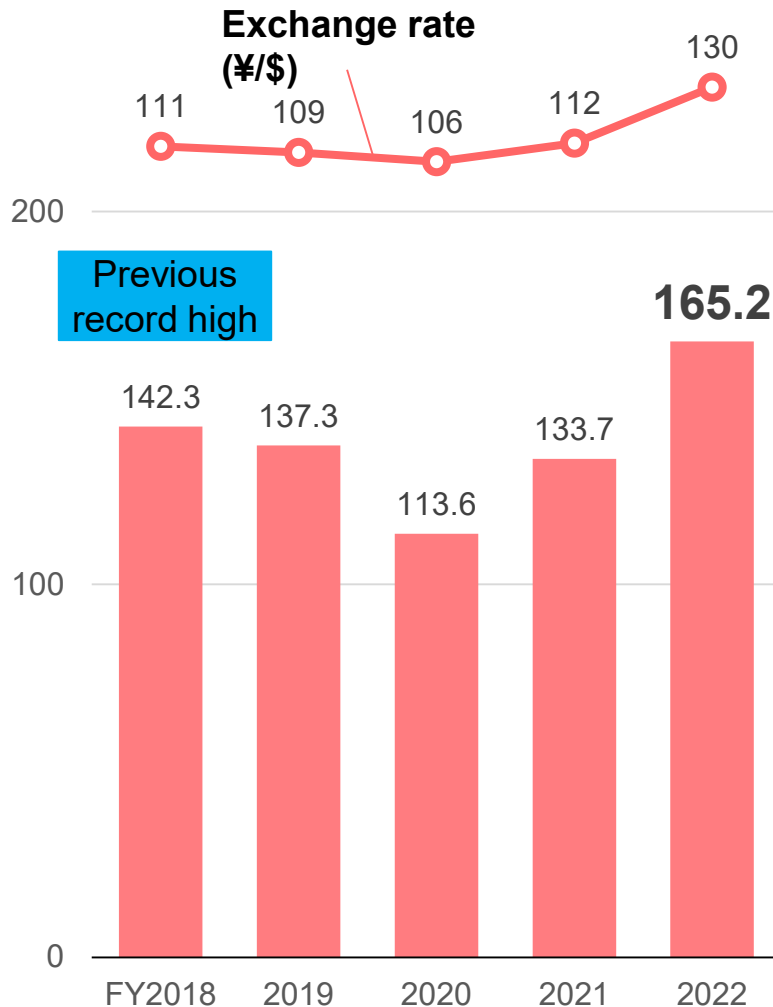
North America and other regions



Key Indicators (Consolidated)

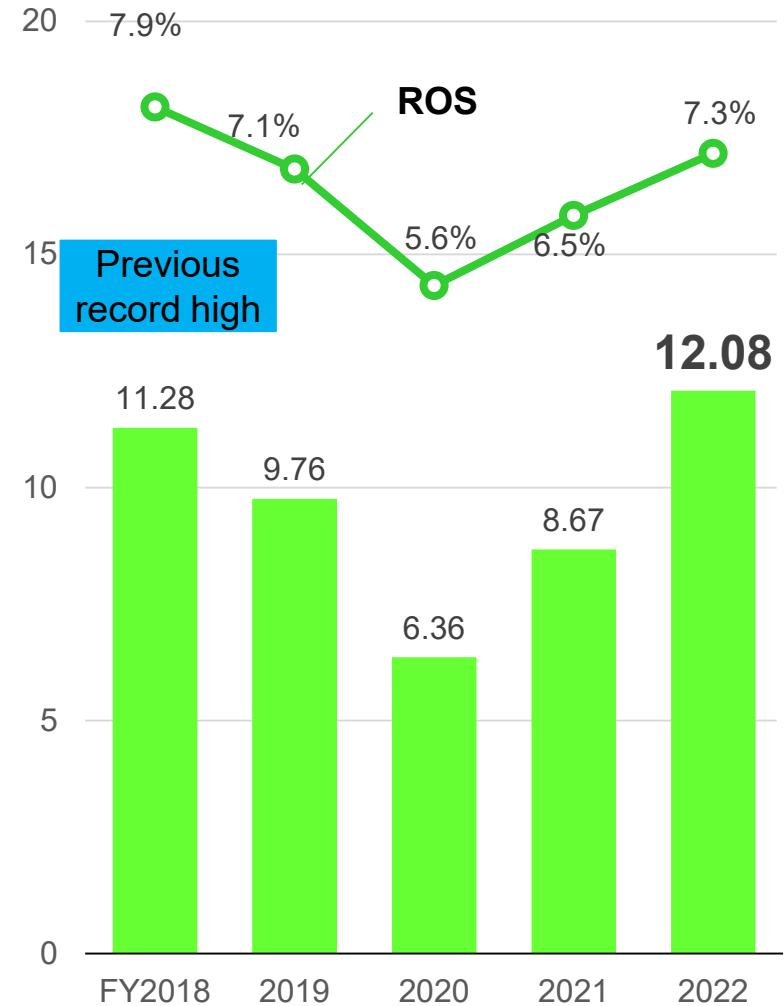
Net Sales

(Billions of yen)



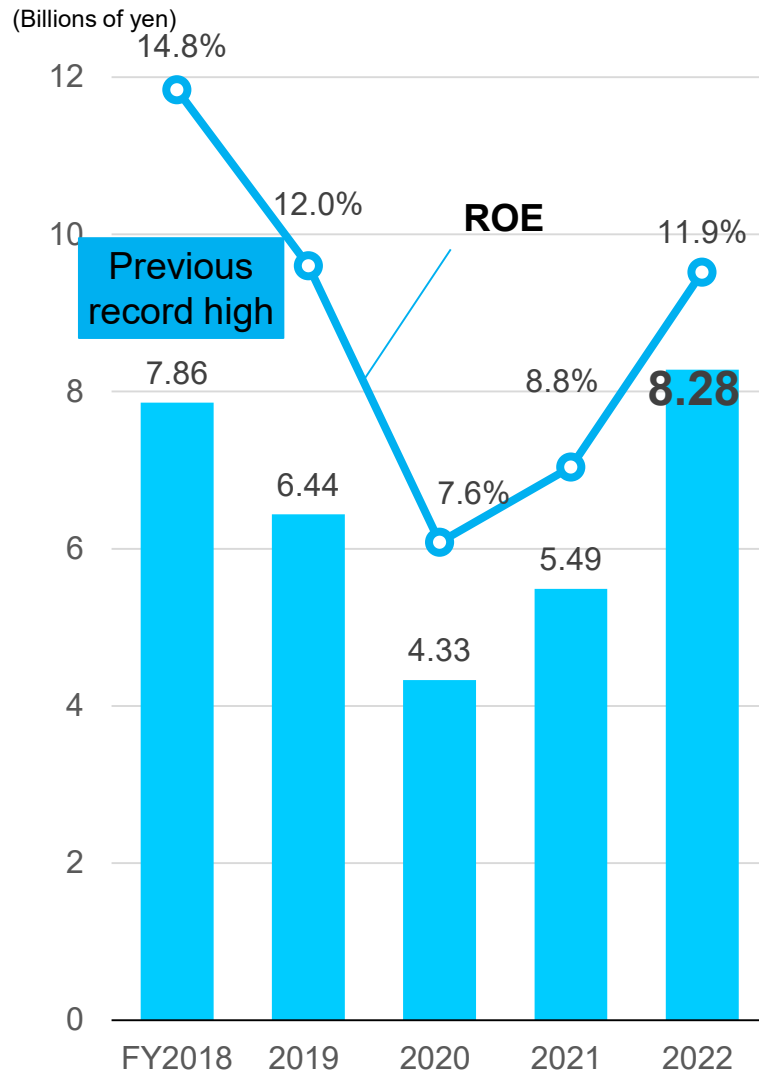
Ordinary Profit

(Billions of yen)

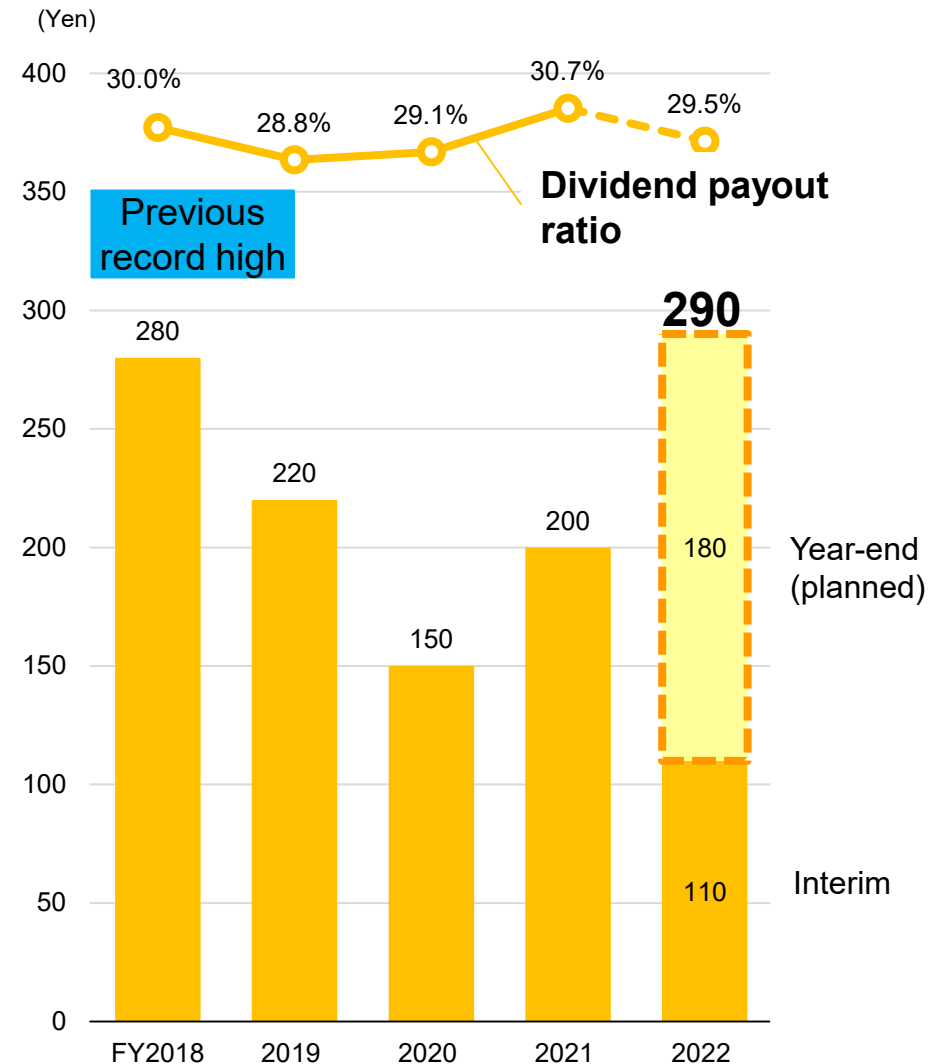


Key Indicators (Consolidated)

Profit



Shareholder Dividends



We expect year-on-year increases in sales and profit due to the Group's technological strength and global response capabilities, although worldwide political and economic instabilities are making it hard to predict the future.

(Billions of yen)

	FY2022	FY2023*	Year-on-year change	
Net sales	165.20	170.00	+ 4.80	+ 2.9%
Operating profit	11.17	12.50	+ 1.33	+ 11.9%
Ordinary profit	12.08	12.50	+ 0.42	+ 3.5%
Profit	8.28	8.50	+ 0.22	+ 2.7%
ROS	7.3%	7.4%	+ 0.1pt	

(Yen)

	FY2022	FY2023*	Year-on-year change	
Annual dividends	290.00 (planned)	300.00 (planned)	+ 10.00	

*Business results forecasts may vary significantly due to factors such as fluctuations in demand for refractories associated with trends in crude steel output and higher costs resulting from the rise in prices of materials and supplies, overseas transportation and energy caused by the weakening of the yen and other factors.



2. The Group's Business Portfolio and Progress on the 2025 Management Plan

The Group's business portfolio

The Group's mainstream business is

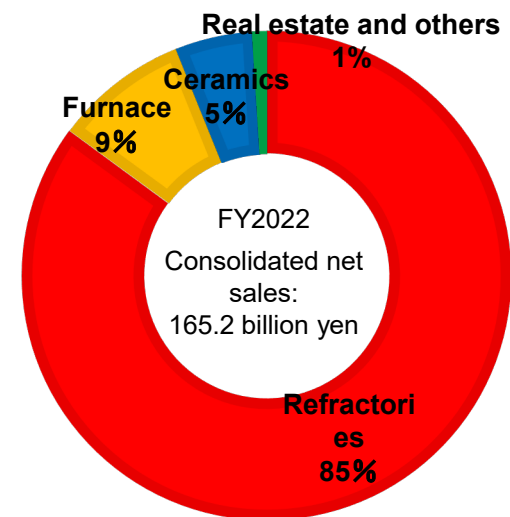
- 1) Manufacture and sale of refractories for steel.

In addition to that, we conduct

- 2) Manufacture and sale of refractories for non-ferrous metals,
- 3) Design, production, construction, and maintenance of various industrial furnaces that use refractories, and
- 4) Manufacture and sale of ceramic products that are applicable to wide-ranging industrial sectors.

All these businesses are globally operated.

Sales breakdown by segment



This multi-faceted portfolio builds a business structure that is not dependent only on trends in the steel industry, the Group's major customer.

2025 Management Plan: Financial Targets and Progress

By FY2025

Net sales:
¥ 150.0 billion

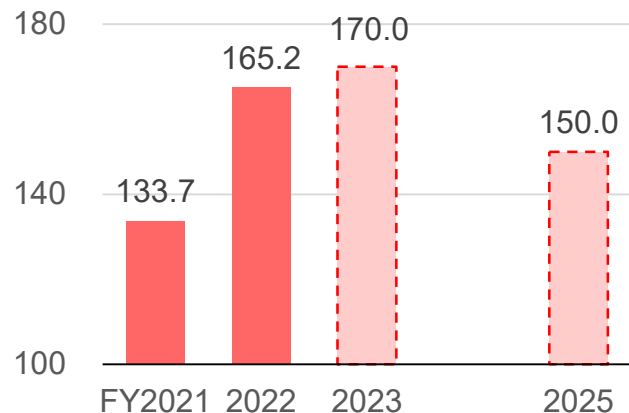
By FY2025

Ordinary profit:
¥12.0 billion

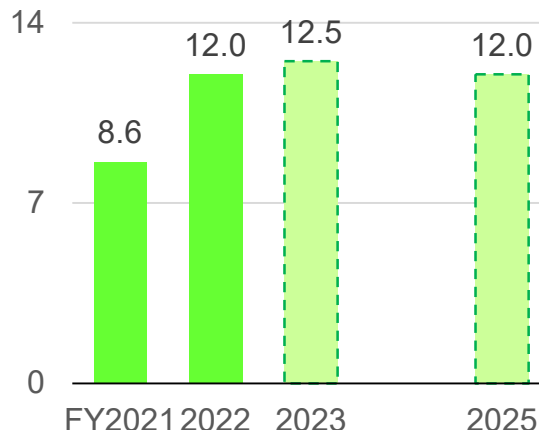
By FY2025

ROS: 8%

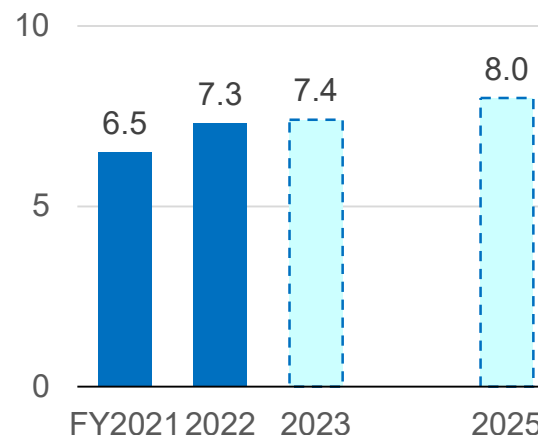
(Billions of yen)



(Billions of yen)



(%)



Summary

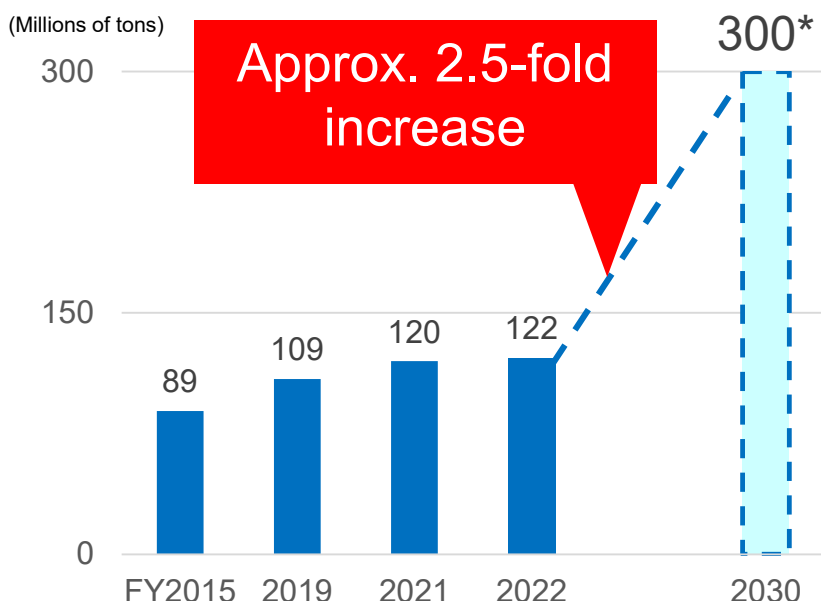
- In FY2022, the Group achieved a record high in both sales and profit by leveraging the strengths of its business portfolio, in addition to making self-help efforts for productivity improvement and manufacturing cost reduction and optimizing sales prices, despite unfavorable circumstances, such as the decline in crude steel output in the steel industry (except in India), the Group's main customer, and the increase in prices of materials, supplies, and energy caused by the rapid weakening of the yen and other factors.
- Both net sales and ordinary profit surpassed the targets set in the 2025 Management Plan. ROS, a measure of earning power, recovered to the pre-COVID level.
- We will continue to implement the key measures in the 2025 Management Plan to further expand revenue.

(1) Expand refractories sales and enhance competitiveness in Japan and overseas

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.

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.

(1) Expand refractories sales and enhance competitiveness in Japan and overseas

Establish full-range production/sales capabilities in India

Enhance competitiveness in the growing Indian market

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

For example, supporting unit package orders for iron making equipment and responding to higher levels of technological requirements

Strengthen ESG management

TRL-K is also strengthening sustainability management through efforts such as becoming the first Indian company certified for SA 8000, an international standard for corporate social accountability.

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



(1) Expand refractories sales and enhance competitiveness in Japan and overseas

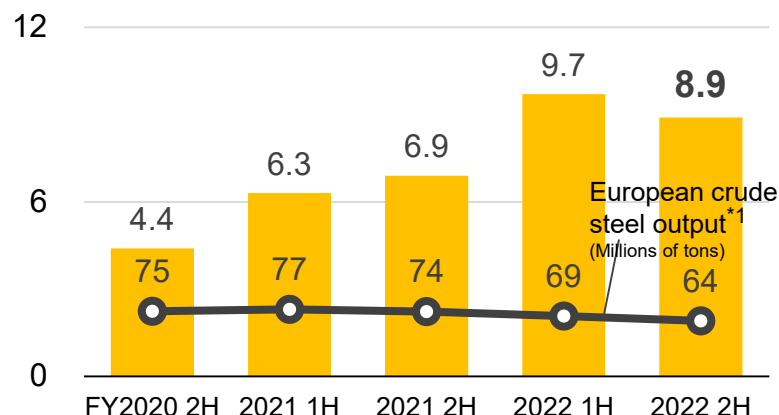
Leverage the effects of partnerships and the business portfolio in the European and South American markets

In European and South American markets, we increased sales by leveraging the effects of partnerships and a diversified business portfolio, amid a slowdown in crude steel output.

Effects of partnerships	Europe: Acquired new customers in East Europe, in addition to West Europe and Northern Europe South America: Secured a manufacturing base where our technologies are used
Effects of diversified business portfolio	Synergy effects from the business structure with strength in products for the non-ferrous metals (cement), in addition to those for the steel industry, and a combination of materials and work enabled by the ability to manufacture refractories and the presence of construction companies in the Group

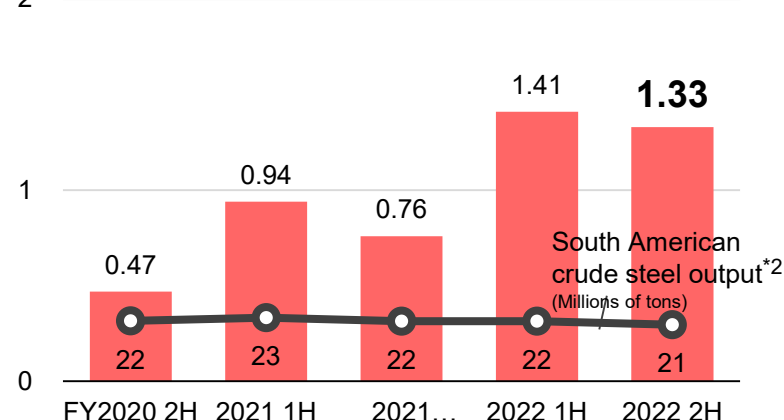
Net sales in Europe

(Billions of yen)



Net sales in South America

(Billions of yen)



*1: Crude steel output in the 27 EU countries.

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

(1) Expand refractories sales and enhance competitiveness in Japan and overseas

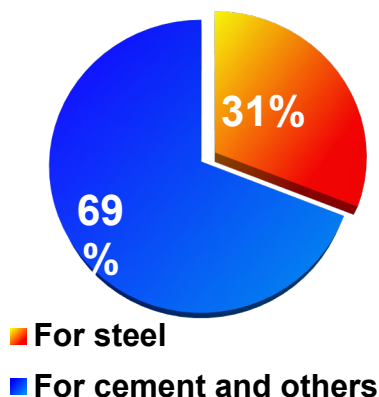
Leverage the effects of partnerships and the business portfolio in the European and South American markets

Business portfolio in Europe

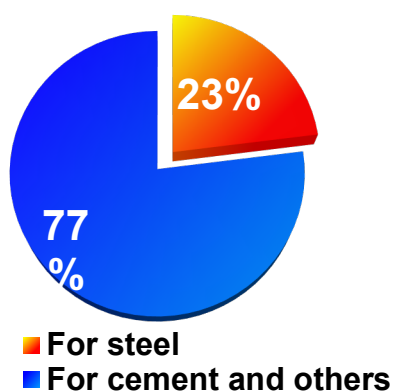
Synergy effects from the business structure with strength in products for the non-ferrous metals (cement), in addition to those for the steel industry, and a combination of materials and work enabled by the ability to manufacture refractories and the presence of construction companies in the Group

Sales breakdowns for two European subsidiaries

<KAMR sales breakdown>



<REF sales breakdown>



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 construction projects.
Parent company: REF (Refractaria, S.A.)

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

(1) Expand refractories sales and enhance competitiveness in Japan and overseas

Enhance competitiveness and leverage future growth opportunities in the Chinese market

Completion of the full automation of WKM's metal case manufacturing line (September 2022)

- Based on full automation, we will drive productivity improvement and labor saving and enhance competitiveness.

Note: This manufacturing line was recognized as a model smart line by the Huishan district of Wuxi City.



Future trends in the Chinese market

- The Chinese market will likely see the replacement of high-grade steel materials sourced from external regions with internally produced ones as China's steelmakers acquire high-grade steel manufacturing capabilities and a shift to manufacturing processes with less environmental impact.



- There expected to be growing demand for refractories for high-grade steel manufacturing and refractories with less environmental impact.
- These refractories are within the area where the Group has an edge with its advanced technologies.

(1) Expand refractories sales and enhance competitiveness in Japan and overseas

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

Challenges for the steelmaking processes in Japan

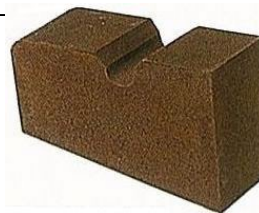
- Reducing CO₂ emissions in the blast furnace method is a challenge in the pursuit of carbon neutrality.
 - To tackle this, blast furnace manufacturers are driving a structural change in the steelmaking processes, such as expanding the use of the electric arc furnace method.
 - Using electric arc furnace 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



(1) Expand refractories sales and enhance competitiveness in Japan and overseas

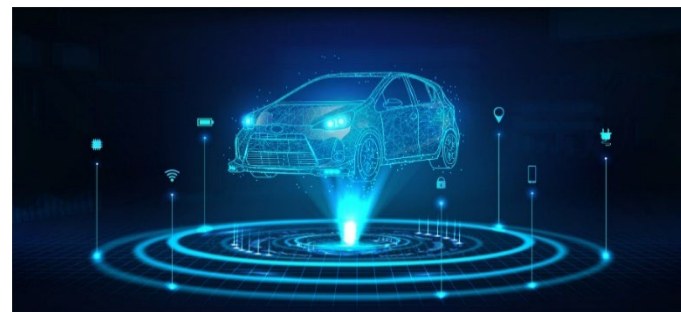
Our refractory technologies essential for high-grade steel manufacturing

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



(1) Expand refractories sales and enhance competitiveness in Japan and overseas

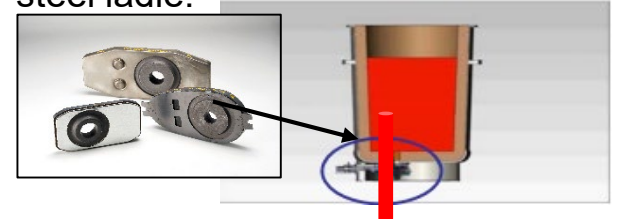
Meet customers' needs with our engineering technologies

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 reducing human intervention 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.



(1) Expand refractories sales and enhance competitiveness in Japan and overseas

Exhibit at METEC, the world's leading international trade fair for metal manufacturing and metallurgical technology, in June 2023

Overview of METEC

- June 12-16, 2023, at Messe Duesseldorf, Germany (held once every four years)
- Visitors to the last METEC in 2019: Approx. 18,000 from 127 countries

Overview of the Group's exhibition

- Joint exhibition by the Company (Japan), KEB (Netherlands), and TRL-K (India)
- We plan to display REX-ROBO® and refractories and show videos on our technologies.
→ We will extensively advertise our products and technologies to increase the recognition of the Group and expand its market presence.

Our booth in the last exhibition in 2019

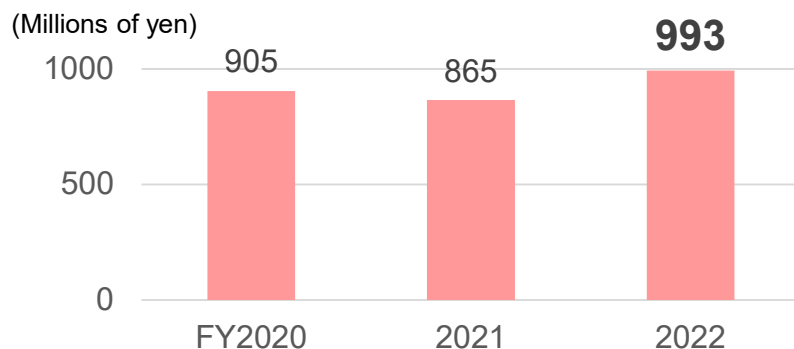


(1) Expand refractories sales and enhance competitiveness in Japan and overseas

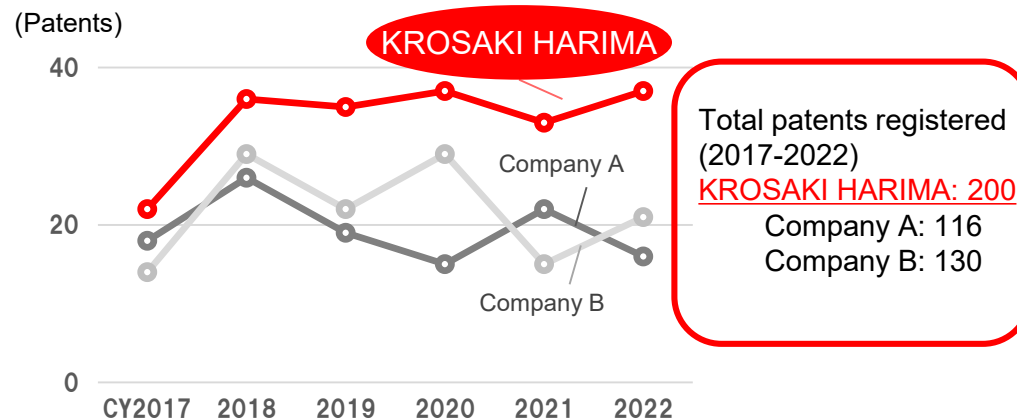
R&D: The source of the Group's technology

R&D expenditures

FY2022: ¥993 million



Number of patents registered in Japan (comparison with competitors)



Example of our latest R&D initiatives

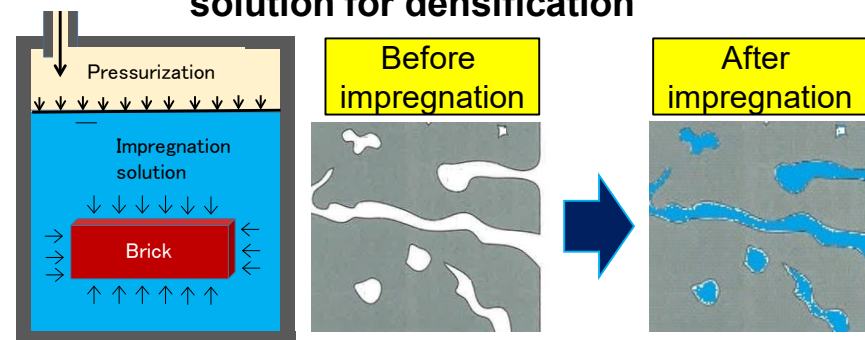
Going green while improving performance

Going green: **Densification without impregnation***
 Improving performance: Improvements in resistant to thermal shock and corrosion

Development

*What is impregnation?

Filling refractory pores with impregnating solution for densification

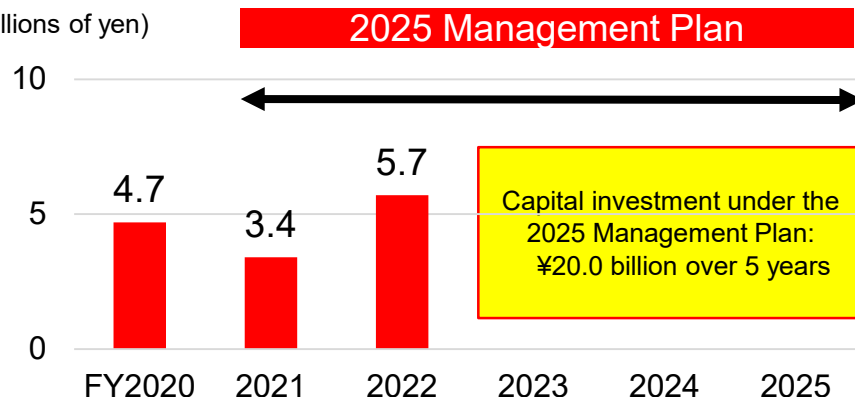


(2) Substantially strengthen earning power in the Refractories segment

Steadily make a ¥20.0 billion capital investment (strategic investment & investment to replace aged equipment) over 5 years

Capital investment

(Billions of yen)

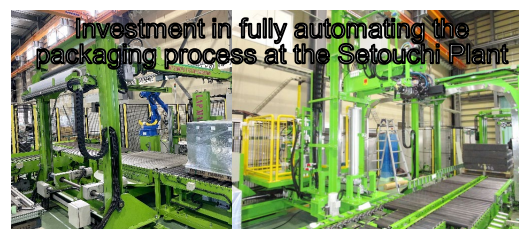


Capital investment under the 2025 Management Plan:
¥20.0 billion over 5 years

- Expand capital investment in line with the growth strategy
- Steadily implement M&A and other strategic investments, which are not included in the Management Plan

Major capital investments in FY2021-FY2022

Japan



Overseas



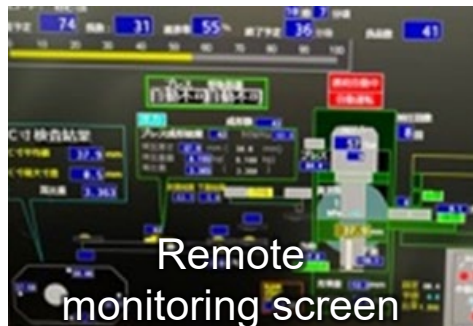
KAMR forming machine
Coming soon
Equipment partially acquired

(2) Substantially strengthen earning power in the Refractories segment

Implement measures to improve manufacturing capabilities and productivity

Promotion of DX: Incorporate IoT into production equipment

- Established Digital Innovation Division in April 2022 to lay the groundwork for Group-wide DX promotion
 - ↓
 - (Examples of accomplishments)
- Real-time remote monitoring of equipment status based on IoT
 - Stable equipment operations through predictive maintenance and planned equipment outages achieved
 - Efficient spare parts procurement realized
- Application of an online conference system for after-sales support for the installation machines we have sold
 - Fast and accurate actions enabled by sharing images and other information of the installation machine in real time



(3) Strengthen earning power in the Furnace segment

Continue to receive large project orders by leveraging a combination of materials and work 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 a combination of materials and work, which is our strength, as well as our technological superiority.

[Combination of materials and work]

Providing both materials (refractories) and installation work to customers



Large-scale project orders received/expected

	FY2019	FY2020	FY2021	FY2022	FY2023 and onward
Blast furnace		NIPPON STEEL CORPORATION Muroran 2 furnaces		NIPPON STEEL CORPORATION Nagoya 3 furnaces	
Hot-blast stove		NIPPON STEEL CORPORATION Nagoya No. 33		NIPPON STEEL CORPORATION Tobata No. 14	<u>Furnace A</u>
Coke oven	NIPPON STEEL CORPORATION Muroran No. 5 West	NIPPON STEEL CORPORATION Nagoya 3 furnaces			<u>Furnace B</u> <u>Furnace C</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

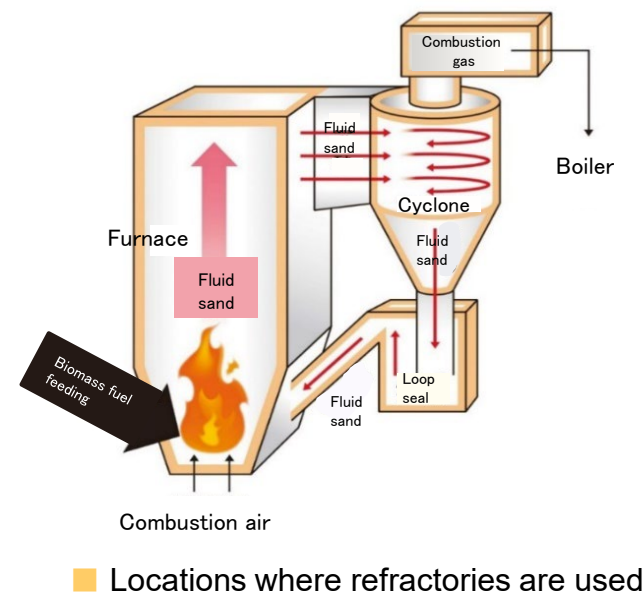
We will continue to actively capture demand for new installations, based on our track record of having received orders for about 40 units to date in Japan and overseas.

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 13 of them and are strengthening our business foundation.

Biomass power generation boilers



(4) Strengthen earning power in the Ceramics segment

Expand 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.

As the semiconductor manufacturing equipment market is forecast to grow over the long term, we will continue to steadily capture expanding demand for our products in Japan and overseas.

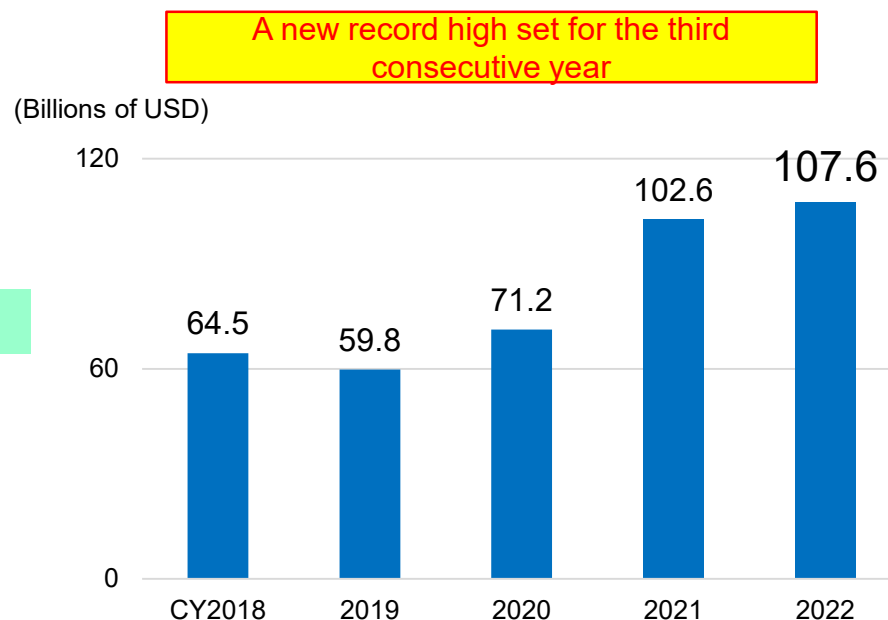
Fine ceramics for semiconductor lithography equipment



Heater for semiconductor manufacturing equipment
(aluminum nitride heater)



Global sales of semiconductor manufacturing equipment*



*Statistics compiled by Semiconductor Equipment and Materials International (SEMI)

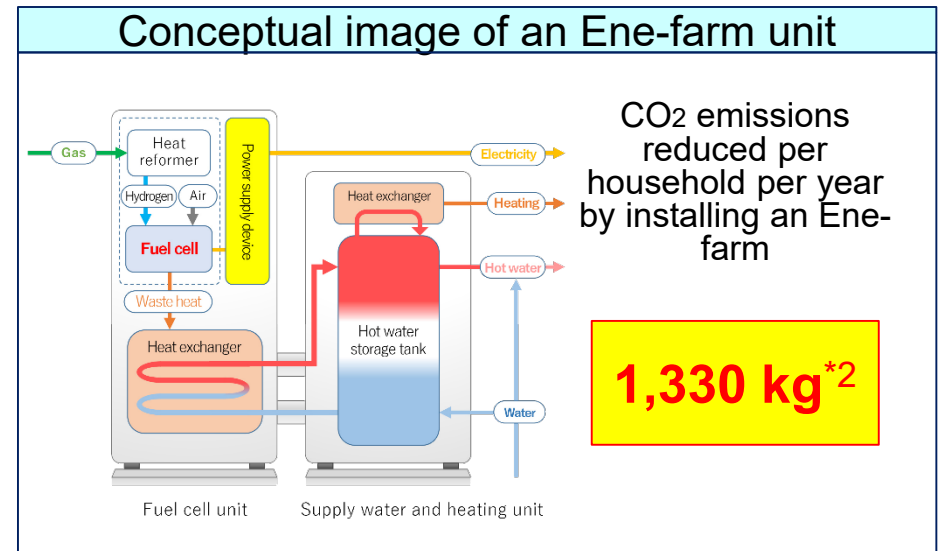
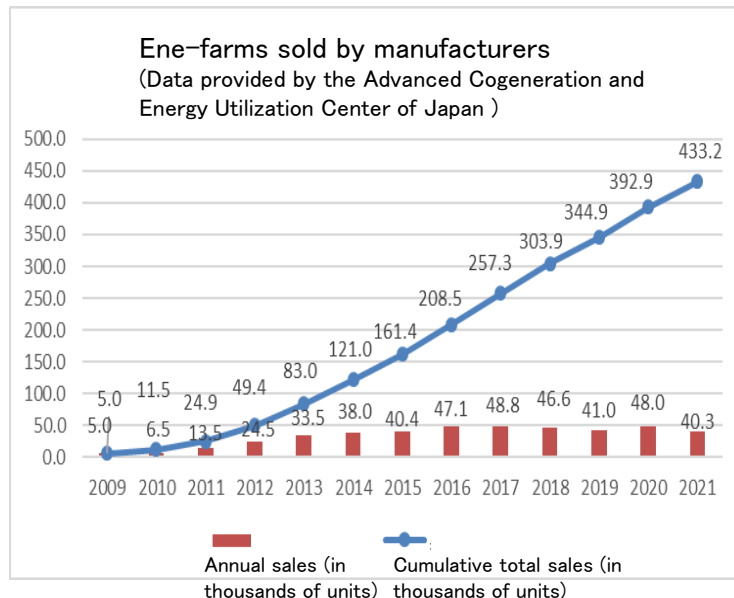
(4) Strengthen earning power in the Ceramics segment

Expand sales in line with the growing thermal insulation (energy efficient) materials market

Our nano-porous thermal insulation material*1 is used in Ene-farms made by a leading manufacturer.

Steadily capture demand for thermal insulation materials for Ene-farms

- The Ministry of Economy, Trade and Industry has set the goal of increasing the total unit sales of Ene-farm residential fuel cell systems to 3 million by 2030.
- With recent sales standing around 0.4 million, demand is expected to grow rapidly.



*1: An insulation material mainly made of fumed silica (silicon dioxide particles). Having many micropores, it can restrict heat transfer. This material maintains a thermal conductivity lower than that of still air up to high temperature ranges.

*2: The general reduction achievable by an entire Ene-farm system indicated in the project evaluation report for the "Large-scale Demonstration Study Project for Stationary Fuel Cells" by the New Energy and Industrial Technology Development Organization.

3. Initiatives to Promote Sustainability



What does it mean to control **heat**?



KROSAKI HARIMA gives you the answer.



The KROSAKI HARIMA Group contributes to creating a society that leaves no one behind by working to achieve all 17 Sustainable Development Goals (SGDs)

Contributing to Society through technologies to control **heat**

Through stable, high-quality production, we will provide a broad range of products to **industries worldwide** and **contribute to saving energy** by providing environmentally-friendly technologies.



A company that values **people**

As a cosmopolitan company that values all people, we promote the **development of global human resources** as well as **women's empowerment** and other **diversity and inclusion** initiatives.



Sustainability targeted by the KROSAKI HARIMA Group

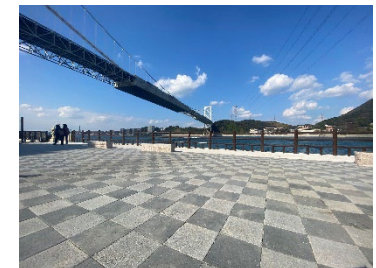
Living together with the **community**

We contribute to **creating livable cities** by providing landscaping materials and actively promote **community revitalization** through participation in community events and the activities of our track and field club.



Continuing to protect the **global environment**

We implement measures to **protect the future for people and the planet** through the **effective use of the Earth's resources**, such as reusing waste water from our plants and developing recycled landscaping materials.



○ Development of new materials contributing to carbon neutrality

Development of a no-need-to-dry gunning material

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

Before Drying needed before use

⇒ CO₂ emissions

After development

No drying needed before use

⇒ **Zero CO₂ emissions**

[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

Before Preheating needed before use

⇒ CO₂ emissions

After development

No preheating needed before use

⇒ **Zero CO₂ emissions**

[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.



○ 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 children 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

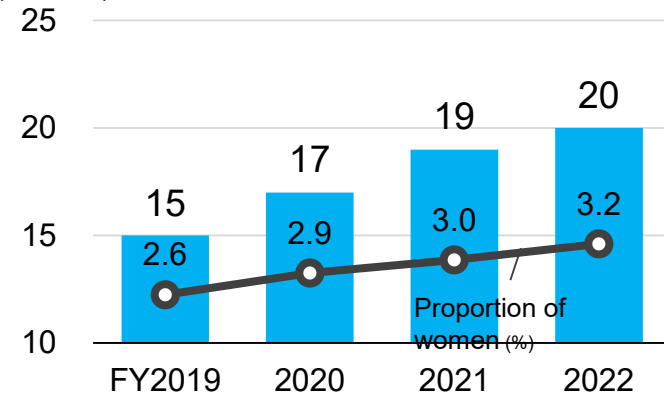
By 2030

Increase by 1.5 times or more

Soon after

Increase by 2 to 3 times

(Persons)



Target ratio of female graduates recruited to the main career track

By FY2025

20% or more

By FY2030

30% or more

○ Diversity and inclusion in the Group's global management framework

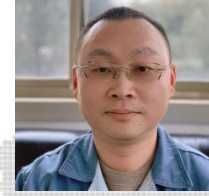
Actively appointing local employees to top positions at overseas subsidiaries
Appointing local managers to operate our overseas subsidiaries and develop sales activities focused on the local region



The Netherlands/KEB



China/KSE



China/WKM

Spain

Netherlands

China
Shanghai
Taiwan

India

The United States



Spain/KAMR, REF



Japan/
KROSAKI HARIMA CORPORATION



India/TRL-K

○ Global employee training

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

Exchange of opinions among executives (direct contact)

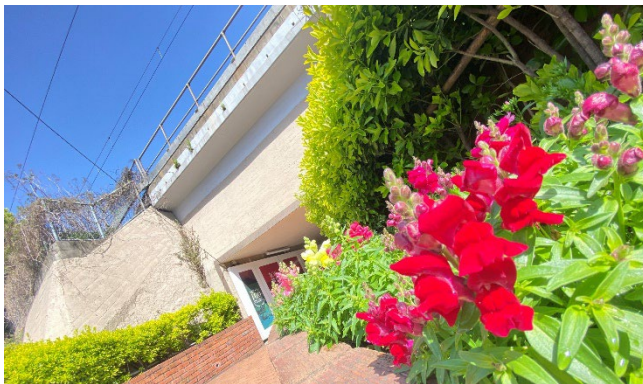


○ Involvement in various community contribution activities

Contributing to creating a livable city



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



Maintaining flowerbeds and performing cleanup activities as a member of the City of Kitakyushu Road Supporter

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



Supported Kitakyushu Marathon 2023 by dispatching an instructor to a related running workshop



Supporting the noticeboards set up in elementary schools in the City of Kitakyushu

○ Achievements of our track and field club

On October 15, 2023, two members of our track and field club will compete in the Marathon Grand Championship (MGC), Japan's qualifying race for the Paris Olympics!



Qualified for the MGC after running at
Fukuoka International Marathon held on
December 5, 2021
Recorded 2:08:16 (2nd)
(1st among Japanese runners)

Kyohei Hosoya

Personal best time: 2:06:35



Qualified for the MGC after running at
Osaka Marathon held on February 25,
2023
Recorded 2:07:55 (15th)

Daisuke Doi

Personal best time: 2:07:55

○ Striving to achieve carbon neutrality by 2050

◆ Reductions up to now

Although emissions in FY2022 increased slightly from FY2013 due to increased production, the intensity of emissions improved compared to FY2013.

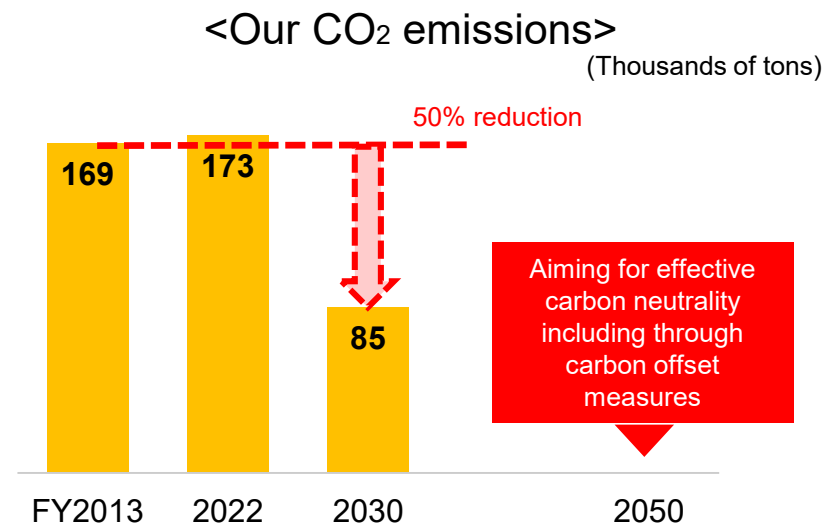
◆ Future reduction targets

Achieve a **50% reduction** from FY2013 levels by FY2030.

Aim for effective carbon neutrality by FY2050, including through carbon offset measures.

<Course toward achieving our reduction targets>

- (1) Reduce CO₂ emissions through **productivity improvements, energy-saving measures, and product shifts** in our manufacturing processes
- (2) Provide products and solutions that contribute to **reducing CO₂ emissions across the whole of society**



Note: Scope of targets

- KROSAKI HARIMA CORPORATION (non-consolidated)
- SCOPE 1: Direct CO₂ emissions from our own fuel usage and production processes
- SCOPE 2: Indirect CO₂ emissions from the usage of electricity and heat we purchase

[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)

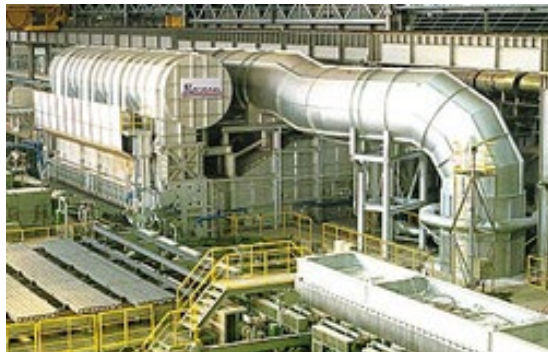
Refractories-related businesses (refractories + furnaces) account for at least 90%



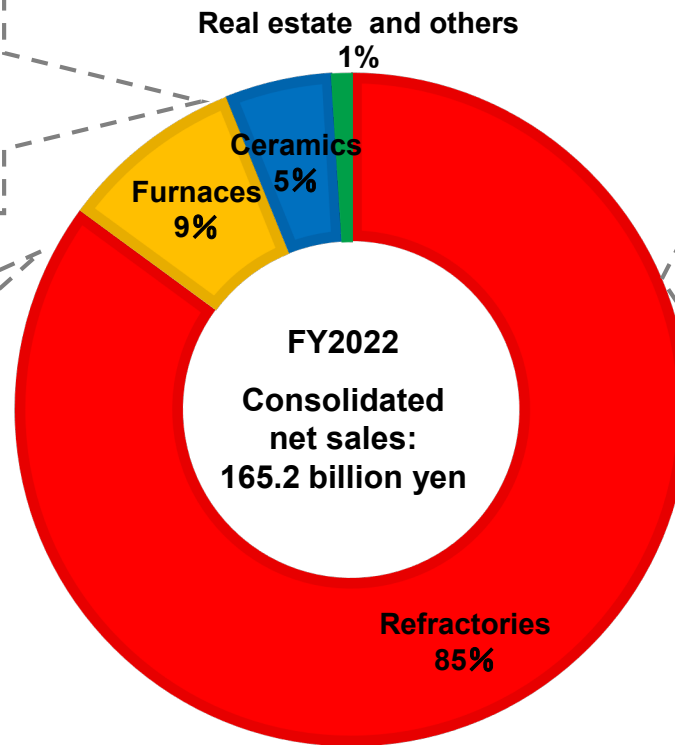
Standards for the calibration of precision measurement devices



Components for electronic component firing



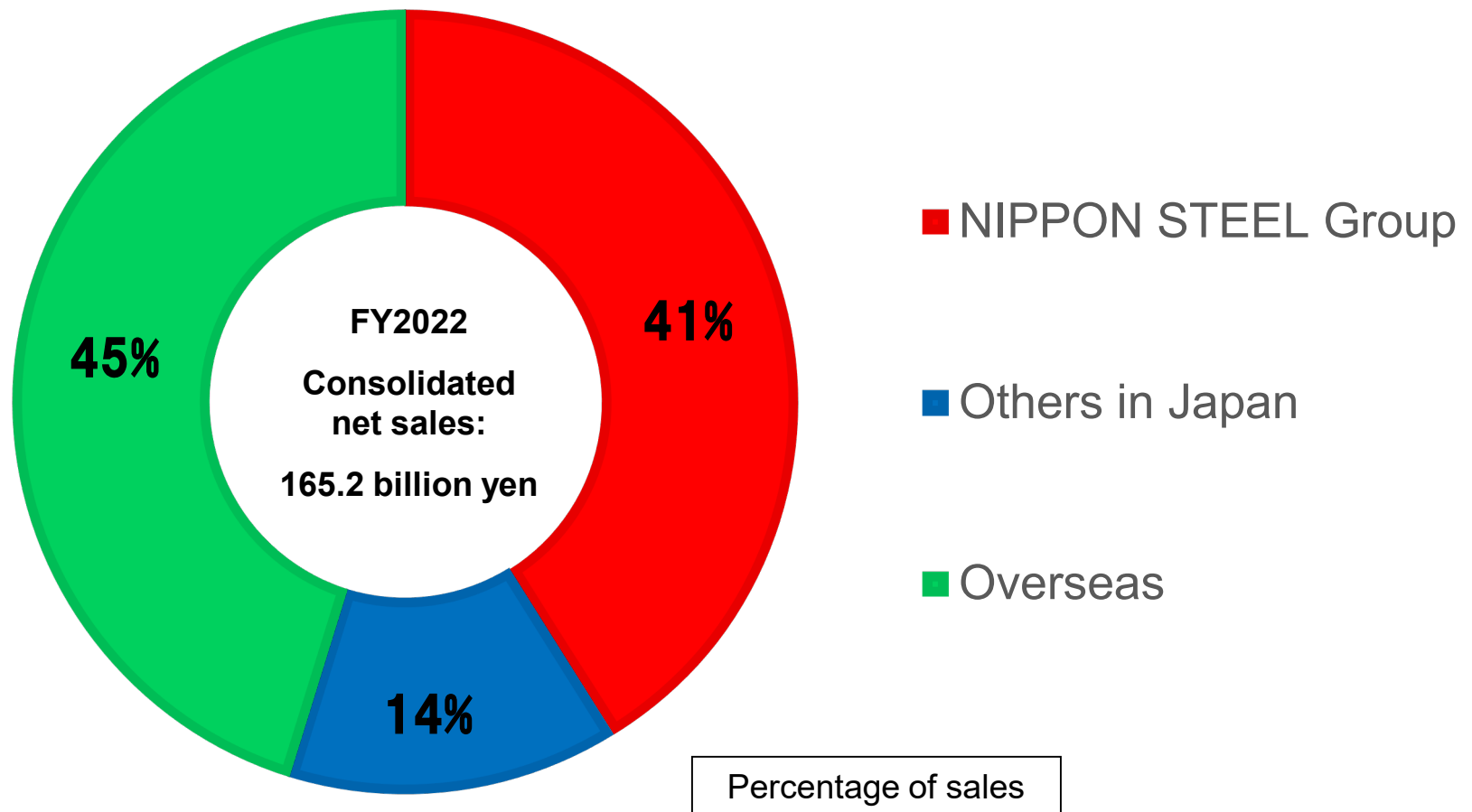
Example of construction work: pusher type billet continuous hot rolling heating furnace



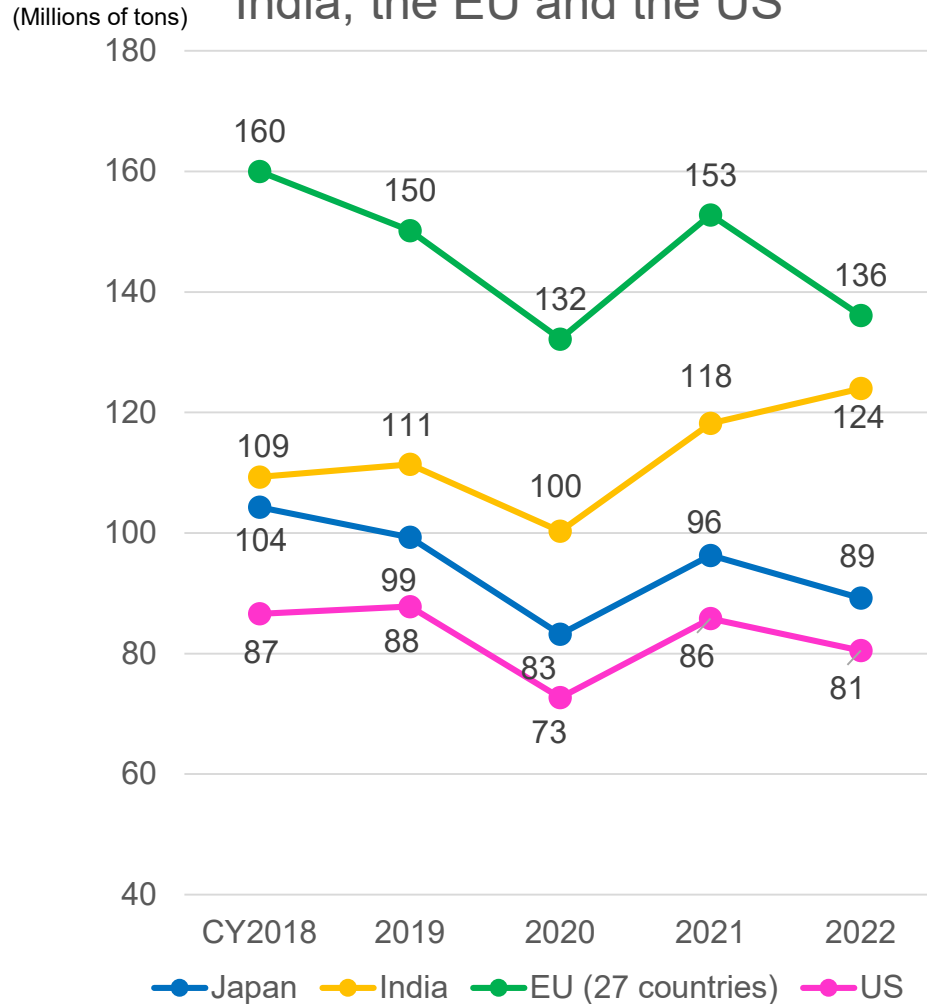
Percentage of sales



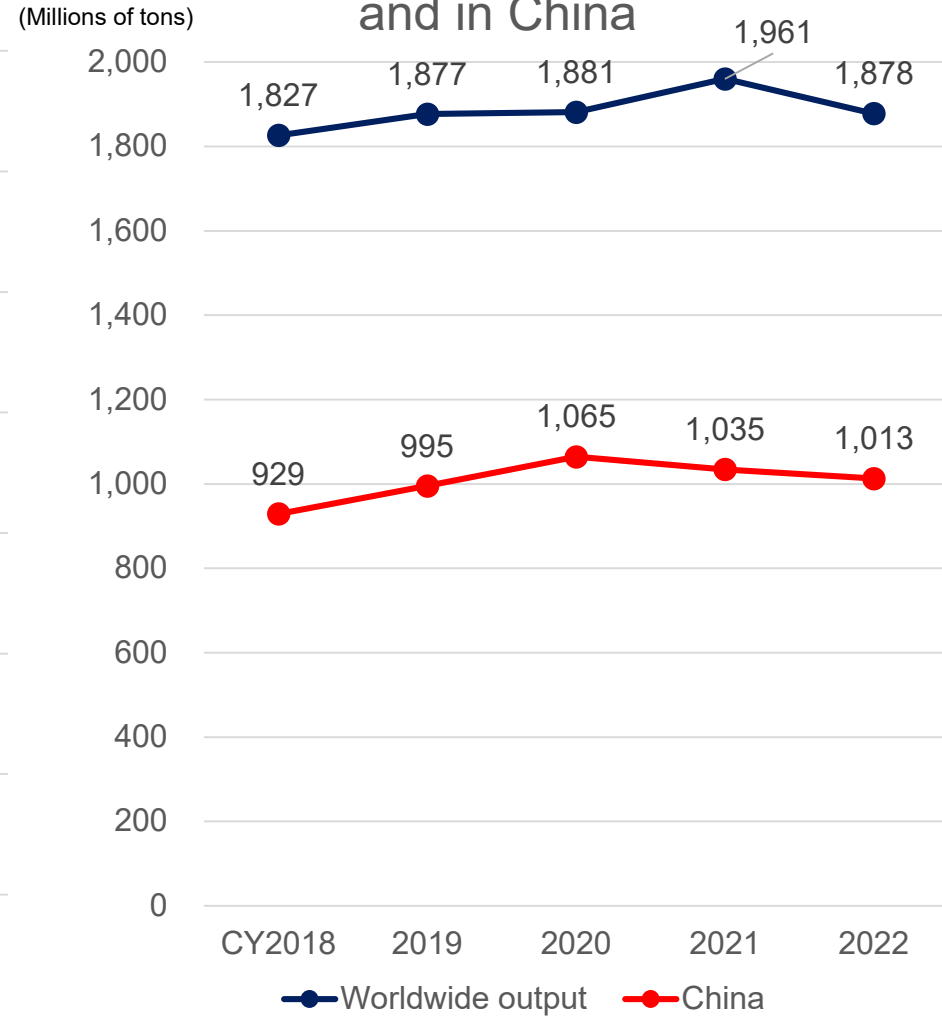
Refractories



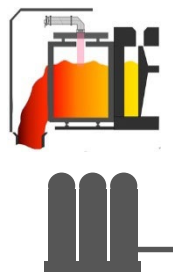
Crude steel output in Japan, India, the EU and the US



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

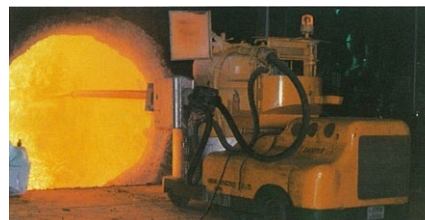


Magnesia-carbon
refractories for oxygen
converters

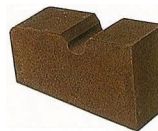


Converters

Life of refractories
Approx. 3 to 4 months



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

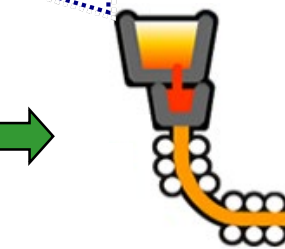


Direct-bonding
magnesia-chrome
refractories for degassing furnaces



Secondary
refining
furnaces

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



Steel ladles / continuous
casting equipment

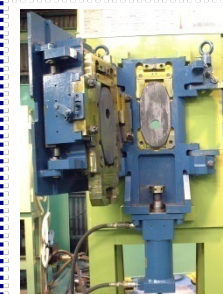
Life of refractories
Replaced every day or
every few days



Gas bubbling
plugs



AG tubes for
continuous
casting

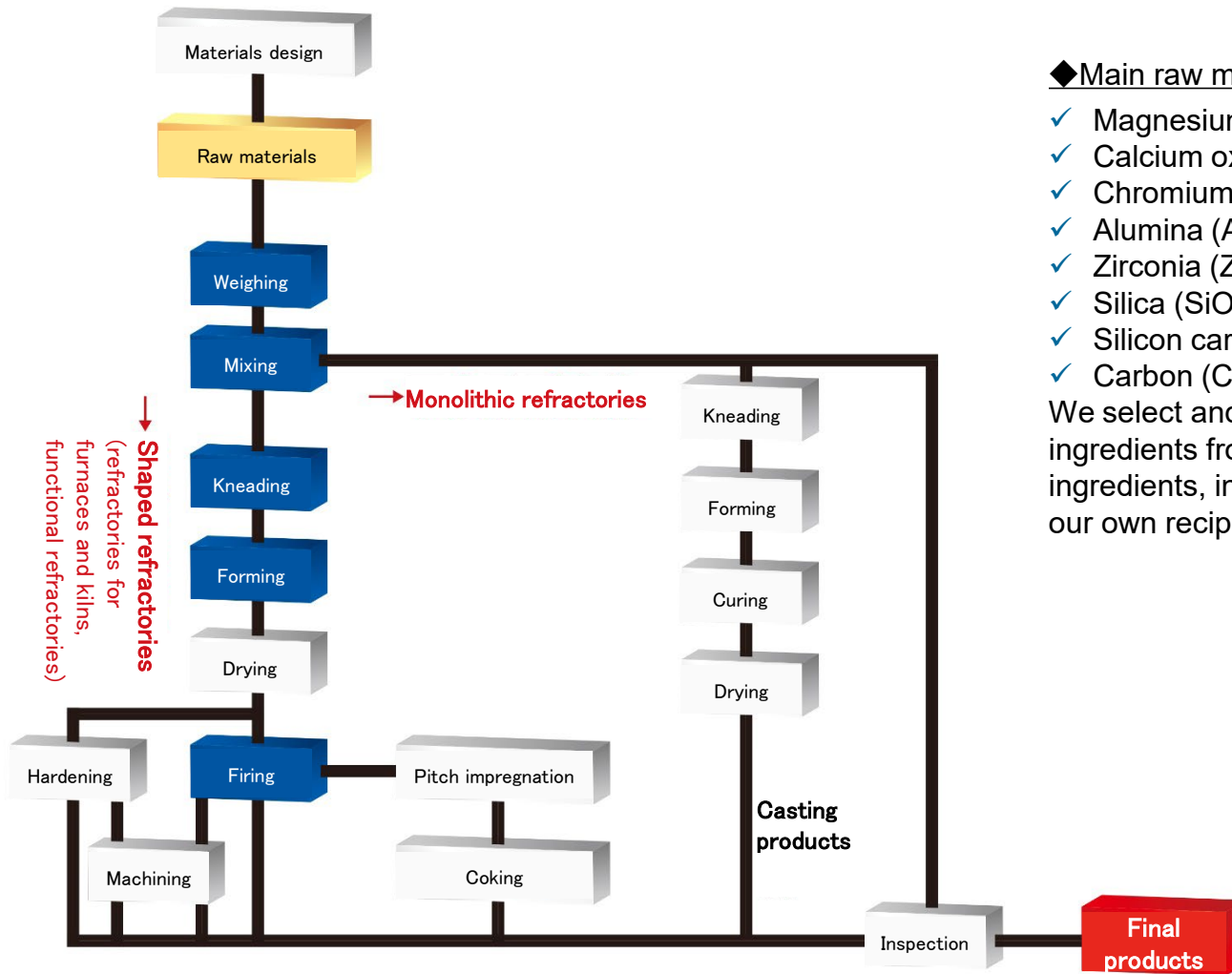


Slide gate plate operating
device



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

■ Locations where refractories are used

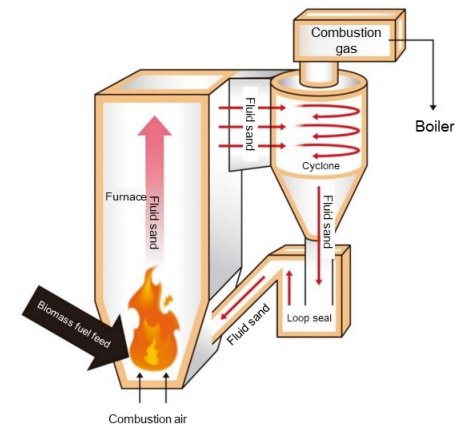
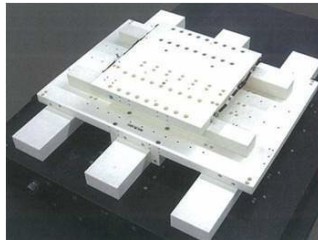


Illustration of a biomass power generation boiler

Contributing to constant performance enhancement for our customers

● Ceramics for precision components

- Semiconductor manufacturing equipment, measurement devices, and optical devices



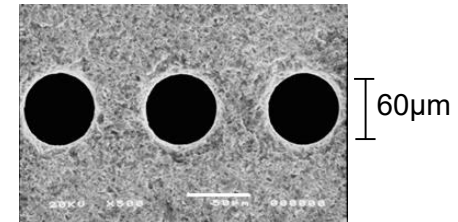
Fine ceramics for applications such as precision machinery and semiconductor manufacturing equipment, utilizing our strengths in large-sized and precision processing, as well as assembly techniques.



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

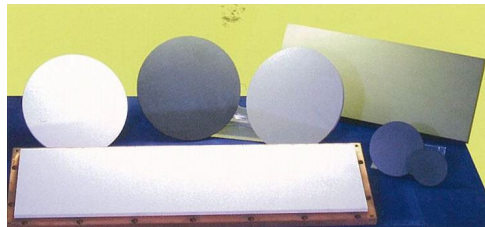
- Electronic component manufacturing, industrial machinery, and semiconductor manufacturing



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

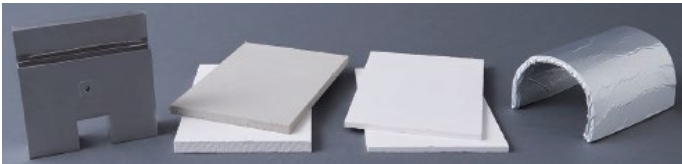
- Electronic component manufacturing



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

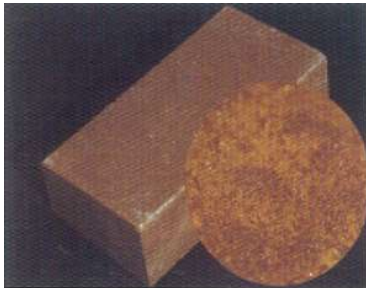
Contributing to society in the fields of energy saving and environment

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



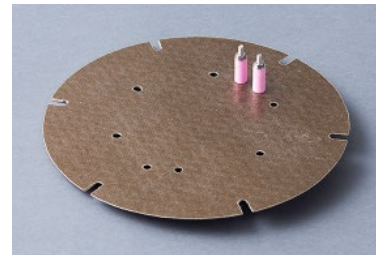
We utilize the thermal insulation characteristics of these products, which provide better thermal insulation than still air and are markedly superior to existing insulation materials, to contribute to saving energy and improving productivity through thinner, smaller, and lighter components.

- 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.