



Ferrotec Holdings Corporation

Progress on the Mid-Term
Management Plan
(FY3/22-FY3/24)

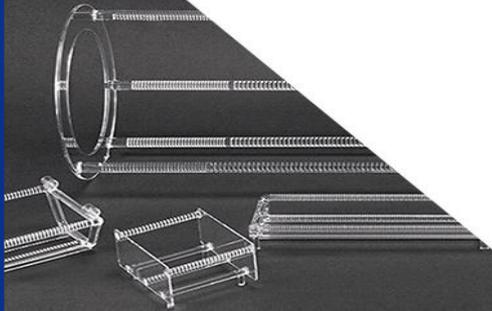
Thur., December 1, 2022



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Review of 2Q of FY3/23



Business results

The performance of the semiconductor equipment-related and electronic device businesses grew, hitting a record high.

Net sales and operating income increased 63.0% and 59.8%, respectively, year on year, both hitting a record high. Net income was 15.9 billion yen (previous forecast: 12 billion yen), including exchange gain, and the interim dividend was raised to 50 yen/share (previous forecast: 35 yen/share).

Products

The active investment for boosting production output paid off, increasing the sales and market shares of various products.

In the semiconductor equipment-related business, the sales of quartz, silicon parts, ceramics, vacuum feedthroughs, and metal processing increased, and our market share and position improved, thanks to the investment for increasing production output at Changshan, Dongtai, and Yinchuan factories.

In the electronic device business, the performance of the AMB substrates for power semiconductors improved rapidly, as the boost of production output matched the growth of demand for these substrates for EVs.

Investment

We actively conducted capital investment for increasing production output, the construction of new factories, and M&A.

We continued the investment for increasing the production output of semiconductor materials (quartz, ceramics, and silicon parts) and power semiconductor substrates.

We promoted the investment for expanding the range of semiconductor-related products, such as wafer recycling and SiC ingots.

We acquired Toyo Knife as a wholly owned subsidiary, and conducted investment for acquiring Ohizumi Mfg. as a consolidated subsidiary.

Finance

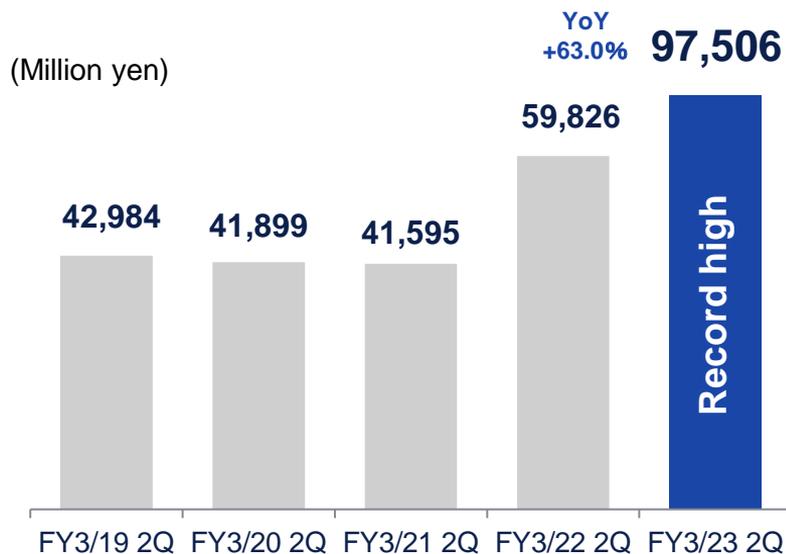
Our financial foundation is stable, and we utilized Chinese capital.

Stable financial standing with equity ratio of 47.3% and a D/E ratio of 0.32.

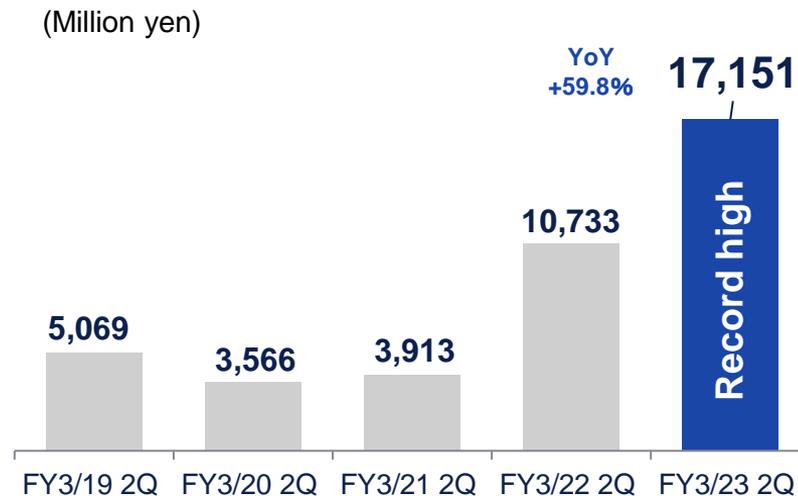
Our Chinese subsidiary procured funds to list its subsidiaries.

- Net sales hit a record high, thanks to the favorable performance of semiconductor materials, metal processing, power semiconductor substrates, etc.
- The favorable revenues from semiconductor-related products and power semiconductor substrates for EVs contributed, and operating income hit a record high.

Net sales



Operating income



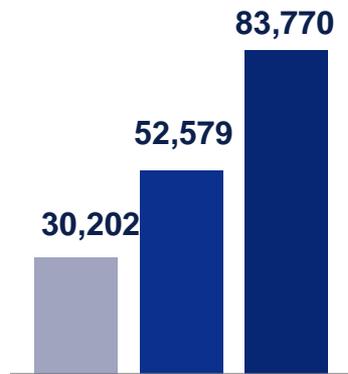
- Major management indicators are improving significantly as we captured the strong demands and the wafer business was excluded from the scope of consolidation.

Variations in key indicators

(Million yen)

Cash and cash equivalents

■ FY3/20 ■ FY3/21 ■ FY3/22 2Q



Equity ratio

*Target (mid-term management plan) for FY3/24
Over 40%



FY3/20 FY3/21 FY3/22 2Q

Operating margin

*Target (mid-term management plan) for FY3/24
Over 16.7%



FY3/21 FY3/22 FY3/22 2Q

ROE

*Target (mid-term management plan) for FY3/24
Over 15%



FY3/21 FY3/22 FY3/22 2Q

Considering the favorable performance, we raised the figures for FY3/23 in the mid-term management plan (disclosed on May 31) in a stepwise manner. 

- Considering strong demand, we announced the second upward revision to the forecast on November 14, after the first upward revision on August 12.
- Actual business performance is exceeding the forecast for FY3/23 made in the mid-term management plan (disclosed on May 31).

| | FY3/23 (forecast) | | FY3/23 (mid-term management plan disclosed on May 31) | FY3/24 (mid-term management plan disclosed on May 31) |
|---|--------------------------------|--|--|--|
| | Forecast revised on Aug. 12 | Current forecast (revised on Nov. 14) | | |
| Net sales | 195 billion yen | 200 billion yen | 180 billion yen | 230 billion yen |
| Operating income | 32.5 billion yen | 34 billion yen | 30 billion yen | 40 billion yen |
| Operating margin | 16.7% | 17.0% | 16.7% | 17.4% |
| Net income attributable to owners of parent | 20 billion yen | 24 billion yen | 17 billion yen | 21 billion yen |

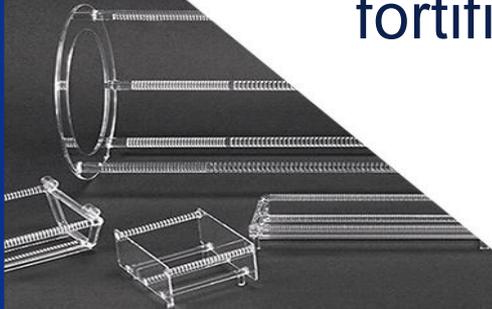
The forecast was revised upwardly in a stepwise manner.



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Regarding our global strategies and the
fortification of our business portfolio



■ We established Ferrotec Manufacturing Malaysia, a subsidiary for manufacturing our products, inside Kulim Hi-Tech Park, Kedah, Malaysia (near to the Penang Island) in April 2022. Its factory is scheduled to be completed around November 2023.

*Business operation oriented toward clients in Southeast Asia (quartz, ceramics, metal processing/assembly, etc.)



Our bases in Malaysia and Singapore



Scene of the groundbreaking ceremony in August 2022



Conceptual drawing



Quartz



Ceramics



Metal processing/assembly

In Ishikawa, we are preparing for the increase of production output of “fine ceramics” and “machinable ceramics,” which are materials related to semiconductor manufacturing equipment and are expected to be demanded further in the medium/long term.

*In November 2022, the second factory was completed. We have acquired land for the third factory, and plan to commence construction around the summer of 2023.



A ceremony for signing an agreement for land with Ozu Town, Kumamoto Prefecture in May 2022



Map of our bases in Japan

★In Ishikawa, we have already acquired land for the third factory to increase the production output of ceramics.



★We plan to establish a production base in Ozu Town, Kumamoto Prefecture in Kyushu dubbed “Silicon Island.” (We plan to start construction in the spring of 2023 or later and complete it in June 2024.)

*We are discussing semiconductor-related products and services to offer in the new base.



The second factory for manufacturing ceramics adjacent to Ishikawa Development Center
*The second factory is located in the right rear side.



Conceptual drawing of a new base in Kumamoto

■ Various systems, including ERP and MES, have been installed in production bases in China, thereby visualizing and streamlining production processes, and improving quality (utilization of AI and adoption of robots).
⇒ To enhance the investment in automation also in the new bases in Japan and Malaysia (cross-sectoral promotion)



Automatic conveyance system



Automatic warehouse system



Automatic inspection equipment

To promote the DX of manufacturing processes to improve productivity and quality

■ In the electronic device business, the manufacturing of “insulated substrates for power semiconductors” became a major business following the global energy-saving trend, like “thermo-electric modules,” temperature-control devices, which are increasingly adopted in many fields.



- DCB substrates
- Alumina ceramics
- Industrial machinery and home appliances



- AMB substrates
 - Silicon nitride and aluminum
 - Electric vehicles (EVs) and railroad cars
- *Demand expanded steeply due to the growth of the EV market

■ The following two companies, which have become consolidated subsidiaries, aim to expand their businesses in the medium term.

- Ohizumi Mfg. Co., Ltd. promotes temperature sensors for in-vehicle devices and air-conditioners and thermistors (elements) in the optical communication field.
- Toyo Knife Co., Ltd. will further cultivate Japanese and Chinese markets for industrial knives mainly in the information industry.

Thermistor

Electronic devices

Semiconductor ceramics sensitive to temperature changes
 Thermistors are semiconductor ceramics that change resistance significantly according to temperature changes. By utilizing this characteristic, thermistors are broadly used as temperature sensors for in-vehicle devices, home appliances, optical communications, etc. The demand for thermistors is growing thanks to the electrification of vehicles and digitalization. Ohizumi Mfg. supplies high-quality thermistors to global first-tier enterprises as the largest maker in the niche market of thermistors.
 *Thermistor is a word coined from “thermally sensitive resistor.”



Both companies will enhance their production capacities and promote automation (maximizing the synergy with Ferrotec).

Industrial knife

Other

Toyo Knife Co., Ltd. manufactures knives for machinery for manufacturing electronic components of smartphones, automobiles, cardboard, etc. Based on the technologies and quality nurtured since 1925 as its strengths, it provides knives for machinery suited for all kinds of materials, including those in the information industry, steel, paper, lumber, and food ingredients, to meet the requests from customers.

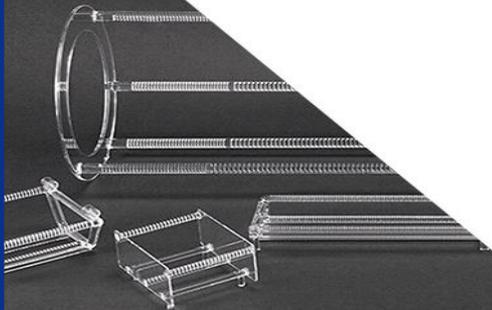




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Progress on the Mid-Term Management Plan



Business growth

A policy of thoroughly pursuing growth is unchanged.

- While monitoring the trend of the semiconductor equipment market, we will pursue growth by increasing our market share and position.
- We will enrich the R&D function, trigger innovation, and develop new products.
- We will enhance investment in Malaysia and Japan, to strengthen our global manufacturing system.

Fortification of the financial standing

While maintaining our stable financial foundation, we will continue active investment.

- We will not change the mid-term management plan of investing 180 billion yen, and keep an eye on the outlook and plans for Toyo Knife and Ohizumi Mfg., which became consolidated subsidiaries.
- We will ensure an appropriate balance between investment opportunities and the financial standing, and consider appropriate use of external capital in China.
- We will focus on net income and continue to strengthen investment return and ROIC management.

Quality improvement

We strengthen quality control and promote digitization, automation, AI utilization, and visualization.

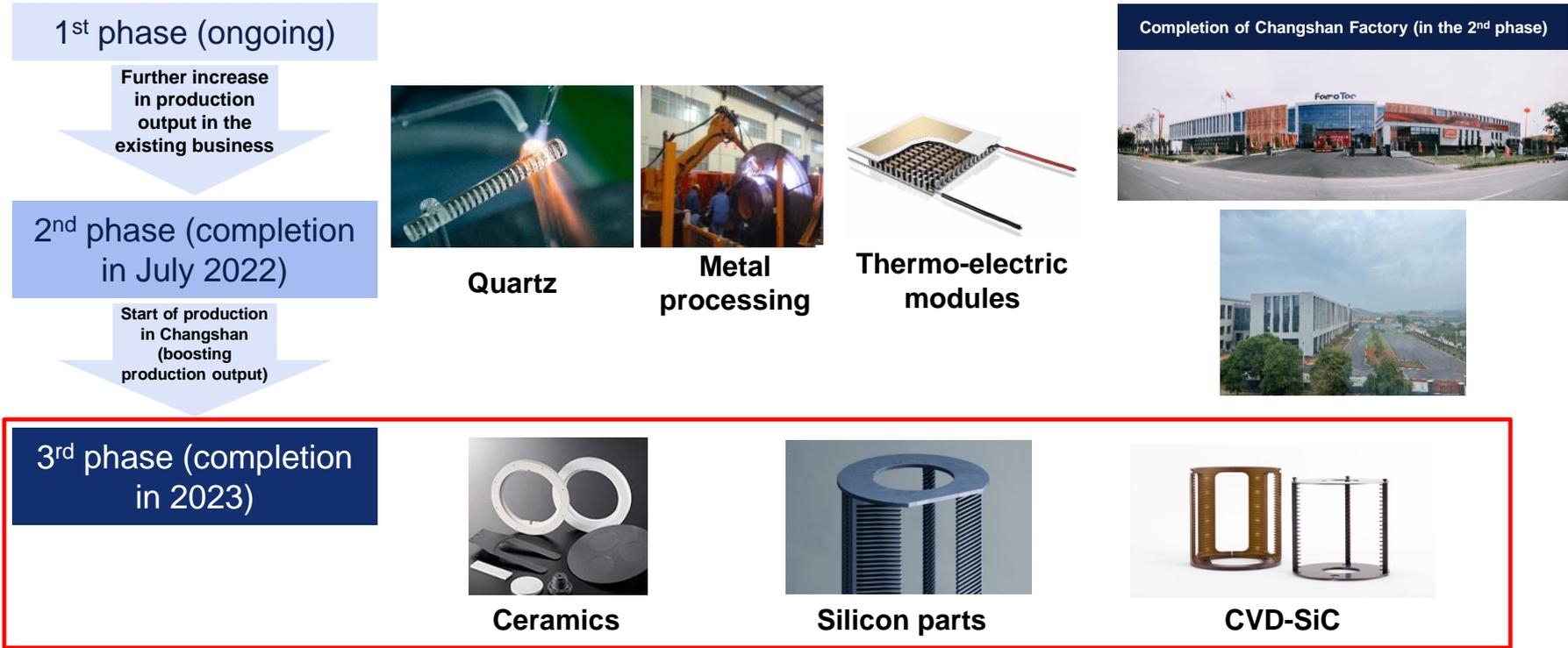
- We will continue to strengthen quality control based on the belief that “quality is vital.”
- We will accelerate the investment in digitalization and automation of production processes, to improve productivity and manufacturing efficiency.

Strengthening of personnel

We will strengthen our organizations and human resources, and improve the foundation for business operation.

- We will strengthen human resources in technology, business and management, and skilled workers in a steady manner.
- We established a China headquarters and completed the construction of the building in December to strengthen the organizational structure and human resources in China.

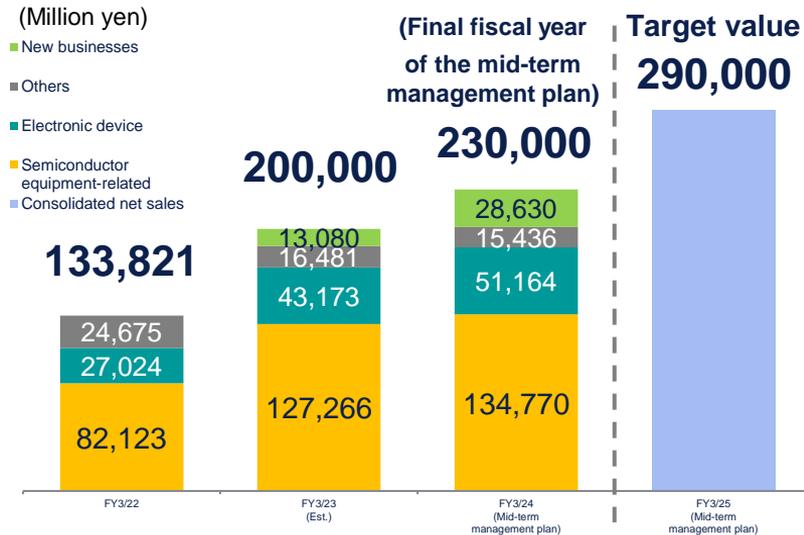
■ The 2nd phase of Changshan Factory: Completed in July 2022. In the 3rd phase, we will start manufacturing ceramics, silicon parts, and CVD-SiC in Changshan.



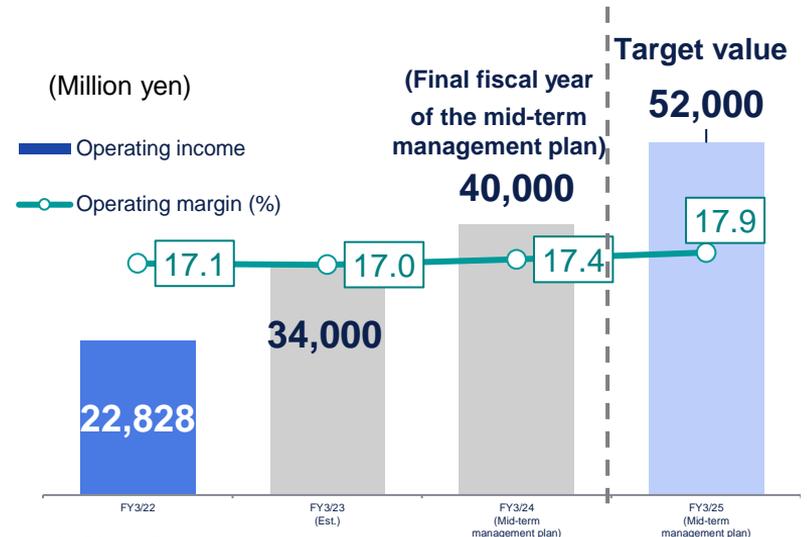
Performance targets: Consolidated net sales and operating income targets

- As the semiconductor market is expected to keep growing for the foreseeable future, we aim to achieve net sales amounting to 290 billion yen in FY3/25.
- We will establish an optimal business portfolio, and aim to achieve an operating margin of 17.9% in the final fiscal year.

Target net sales: 230 billion yen
(FY3/25 target value: 290 billion yen)



Target operating income: 40 billion yen
(FY3/25 target value: 52 billion yen)



| | 3-year mid-term plan period | | | | Target value |
|------------------------------------|-----------------------------|---------------------------|--------------------------------------|---------------------------|---|
| | FY3/22 (actual) | FY3/23 (initial forecast) | FY3/23 (forecast revised on Nov. 14) | FY3/24 (plan) | FY3/25 (plan) |
| (Million yen) | | | | | |
| Net sales | 133,821 | 180,000 | 200,000 | 230,000 | 290,000 |
| Operating income | 22,600 | 30,000 | 34,000 | 40,000 | 52,000 |
| Operating margin | 16.9% | 16.7% | 17.0% | 17.4% | 17.9% |
| Net income | 26,659 | 17,000 | 24,000 | 21,000 | 27,000 |
| ROE | 26.9% | Over 15% (unchanged) | | | *Details of sales in FY3/25 (plan) in each segment and main products are not disclosed. |
| ROIC* | 15.8% | Over 8% (unchanged) | | | |
| Equity ratio | 49.5% | Over 40% (unchanged) | | | |
| Investment amount | 35,378 | 73,622 | 73,622 | 71,000 | |
| Dividend per share (annual) | 50.0 yen | 70.0 yen | 100.0 yen | Payout ratio of about 20% | |

*ROIC = Net income attributable to owners of parent / (Interest-bearing debt + Net asset)

Net asset does not include share acquisition rights or non-controlling interests' equity.

*Net income refers to net income attributable to owners of parent.

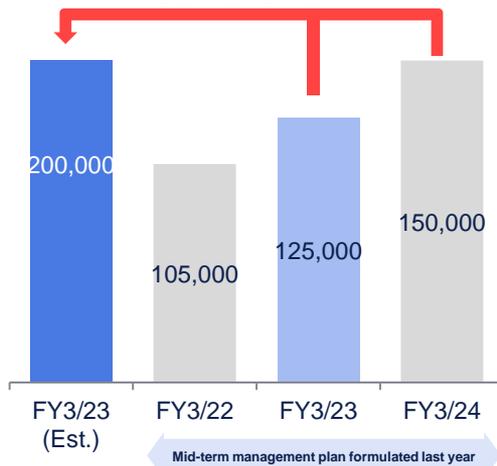
Achieved key mid-term plan targets ahead of schedule

- We revised the forecast upwardly twice, and are expected to attain the key mid-term plan targets, which were formulated at the beginning of the term, earlier than scheduled.
- Our company's growth has been significantly faster than the assumption of the mid-term management plan disclosed last year thanks to the combination of increased production capacity and a sharp increase in demand.

Net sales

(Million yen)

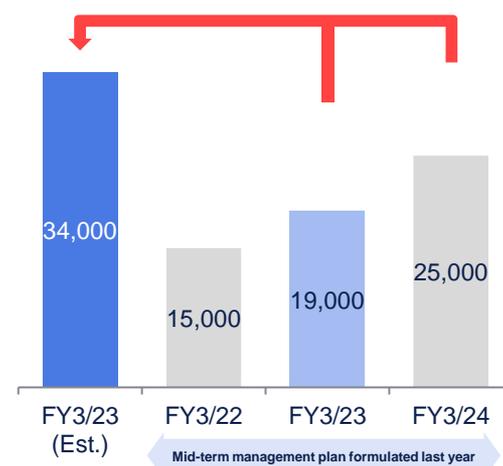
Early achievement



Operating income

(Million yen)

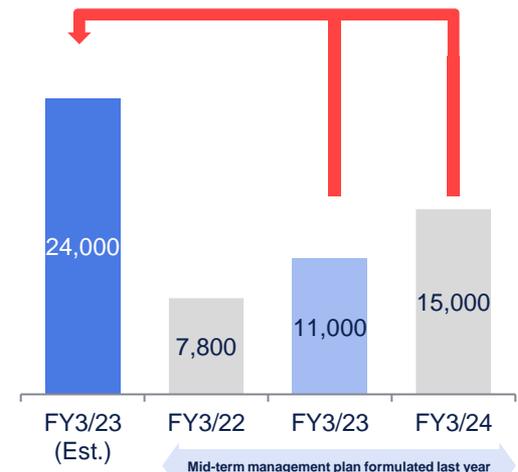
Early achievement



Net income

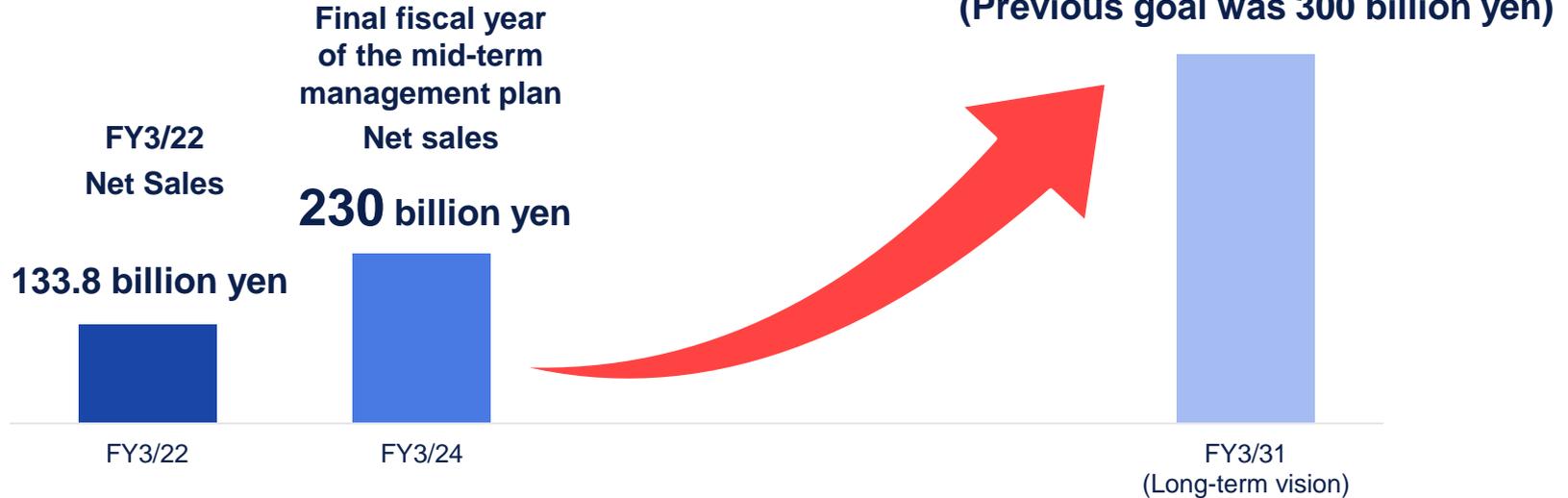
(Million yen)

Early achievement



Strong performance trend continues and we aim to achieve the following long-term performance targets!

Net sales of **500 billion yen** and a net income of **50 billion yen** in FY2030 (ending March 2031)

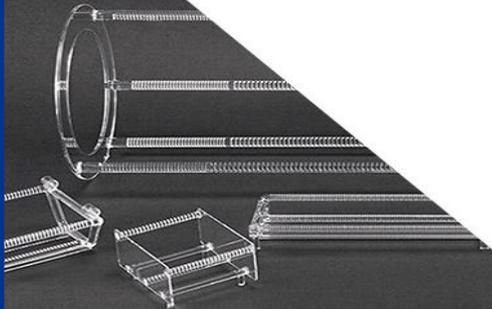




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Update of investment plan and capital policy



- In addition to the increase in production output of semiconductor materials, power semiconductor substrates, etc., we have invested in Toyo Knife and Ohizumi Mfg.
- The 3-year plan for investing 180 billion yen, including the acquisition of shares via M&A, which was formulated at the beginning of the term, is unchanged.

[Initial investment plan]

A total of 180 billion yen

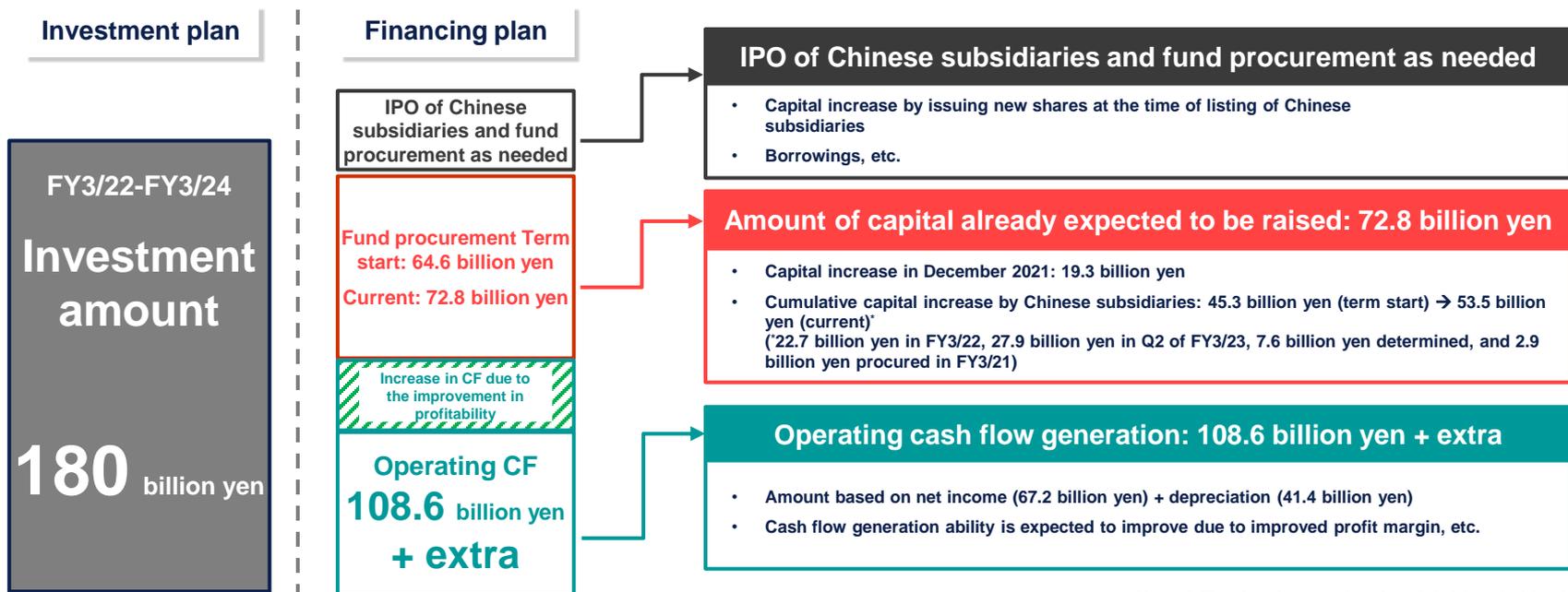


Investment plan in the 3-year mid-term management plan

[Progress so far]

- Invested 35.4 billion yen in FY3/22 and 29.8 billion yen in the 1st half of FY3/23 (including the acquisition of shares).
- Invested for boosting the production output of materials such as quartz, ceramics, and silicon parts, and power semiconductor substrates.
- Worked on the investment in Malaysia, and the construction of new factories in Ishikawa and Kumamoto.
- Acquired Toyo Knife as a wholly owned subsidiary, and acquired 51% of shares of Ohizumi Mfg. to make it a consolidated subsidiary.
- Our plan of investing 180 billion yen, which was formulated at the beginning of the term, has not been changed. There is a possibility that this plan will be revised, according to new M&A projects, consolidated subsidiaries' investment plans, etc.

- The amount of capital to be raised in 3 years and the assumed operating CF (net income + depreciation) amount to over 180 billion yen.
- Our company expects that we will need to raise funds to deal with the increase in working capital, but even if the IPO of the Chinese subsidiaries is not factored in and the total amount is raised through borrowings from financial institutions, our company expects to maintain an equity ratio of 40% and a D/E ratio* of about 0.5, and this has not been changed since the beginning of the term.



Note: D/E ratio = Interest-bearing debt/shareholders' equity

Schedule of listing subsidiaries we assumed

- Our parts cleaning subsidiary received a notification on the approval for listing on November 16, 2022. An IPO is scheduled to be made around January 2023 (new shares with a 25% equity stake will be issued).
- The equity-method affiliate that manufactures silicon wafers applied for listing in August, the application was accepted and the procedures are underway.
- The subsidiary that manufactures quartz crucibles and silicon parts changed the stock market to the Main Board of the Shenzhen Stock Exchange and listing advisers to Orient Securities.

| Business | Parts cleaning | Quartz crucibles and silicon parts | Power semiconductor substrates | Silicon wafer (equity method) | |
|---------------------------------------|---|--|---|--|-------------------------------|
| Company name | Ferrotec (Anhui) Technology Development Co., Ltd. | Ningxia Duryuan Juxin Semiconductor Technology Corporation | Jiangsu Ferrotec Semiconductor Technology Co., Ltd. | Hangzhou Semiconductor Wafer Co., Ltd. | |
| Abbreviation | FTSVA | FTNC | FLH (formerly, FTSJ) | CCMC | |
| Current investment ratio | 66.98% | 60.13% | 55.10%* | 23.05% | |
| Stock market | ChiNext, Shenzhen | Main Board, Shenzhen (previously, STAR Market, Shanghai) | STAR Market, Shanghai | STAR Market, Shanghai | |
| Listing advisor | Everbright Securities | Orient Securities Investment Banking (previously, Everbright Securities) | Huatai Securities | Haitong Securities | |
| Most recent valuation (after 2021)** | - | 112.8 billion yen | 155.1 billion yen | 307.2 billion yen | |
| Percentage of new shares to be issued | 25% | 25% | 25% | 25% | |
| P r o g r e s s | Listing advisor registration | Aug. 11, 2020 | Nov. 4, 2021 | Feb. 23, 2022 | Oct. 20, 2021 |
| | Application | Jun. 28, 2021 | Second half of 2022 (planned) | First half of 2023 (planned) | Aug. 29, 2022 |
| | Passing the screening | May 6, 2022 | - | - | - |
| | Official approval | Nov. 16, 2022 (notified) | - | - | - |
| | Date of listing | Dec. 2022 to Jan. 2023 (planned) | 1Q of 2024 (planned) | Second half of 2024 (planned) | Second half of 2023 (planned) |

*FLH (formerly, FTSJ) investment ratio is the figure after the capital increase through third-party allotment (disclosed on November 15, 2022).

**Values are calculated based on the share price at the time of the third-party allotment since 2021; FTSVA is omitted because there was no opportunity to evaluate the share price over the past 2 years or so. Exchange rate was assumed to be 1 yuan = 20.15 yen.

[Contents disclosed on May 30, 2022]

Dividend Policy

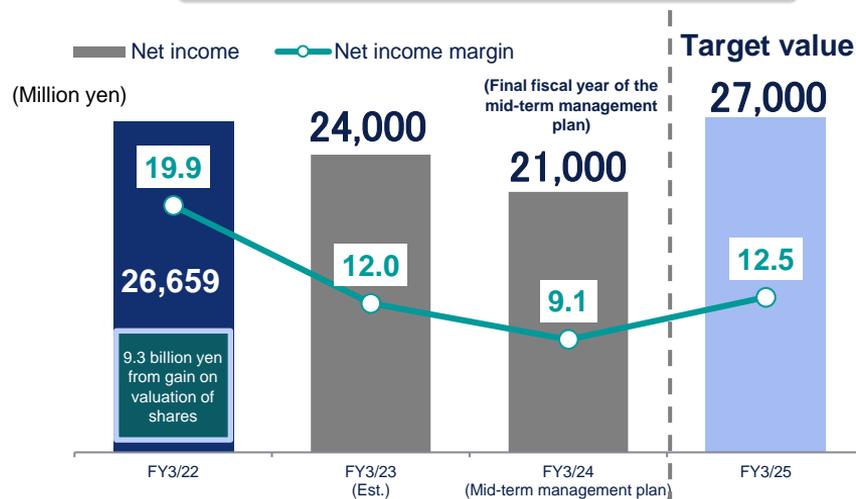
While the basic policy of increasing shareholder return through sustainable earnings growth remains unchanged, decisions on dividends will be made with an eye on a “payout ratio of 20%” and in consideration of the balance between financial and investment opportunities.

<Initial> <Revised>
 • Dividend per share: 70 yen/year ⇒ 100 yen/year

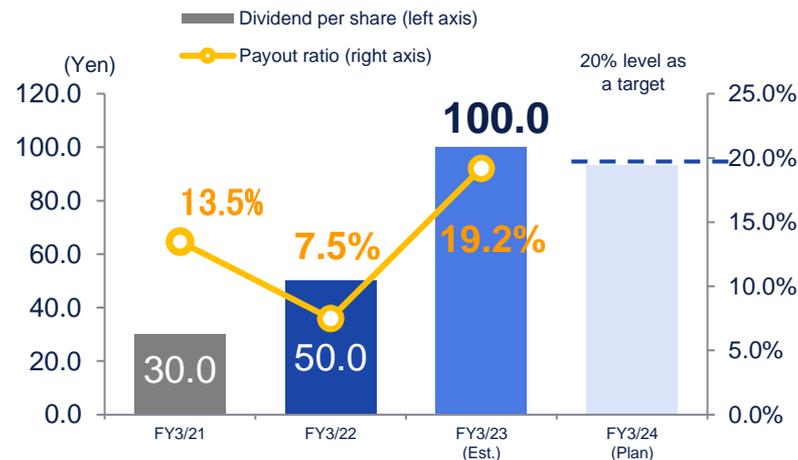
[Total dividend] (3.2 billion yen) ⇒ (4.6 billion yen)
 [Net income] (17 billion yen) ⇒ (24 billion yen)

***We will determine the dividend amount, while considering net income after deducting temporary profit with no cash inflow, such as profit from changes in equity.**

Target net income



Dividend target



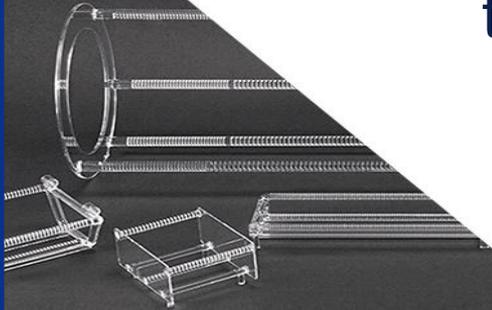
*Net income refers to “net income attributable to owners of parent.” Copyright © Ferrotec Holdings Corporation. All Rights Reserved.



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Situation of priority products and the outlook for the second half of the current term



Jigs and consumables for semiconductor manufacturing equipment (our mainstay material products)



Quartz



Silicon parts



Ceramics



CVD-SiC

Our strengths: Not only capital investment-linked products (vacuum feedthroughs), but also a lineup of **repeat consumables (materials)** and services (cleaning and wafer recycling) **linked to the production and operation of semiconductor device manufacturers**



Vacuum feedthroughs

*Semiconductor and FPD production equipment parts (Market share: 65% (largest))

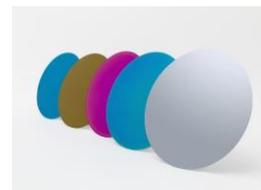


Metal precision machining

*Growth forecast due to increase in future customers (factories) in China



Machinery parts cleaning



Wafer recycling

*Focus on the Chinese market (New business launched in FY3/22)

Businesses at equity-method affiliates



Silicon wafers

*Monthly production capacity: 6-inch: 420 thousand, 8-inch: 450 thousand, 12-inch: 30 thousand (increased from 100 thousand to 200 thousand)



SiC wafers

*Development and mass-production (New business launched in FY3/22)

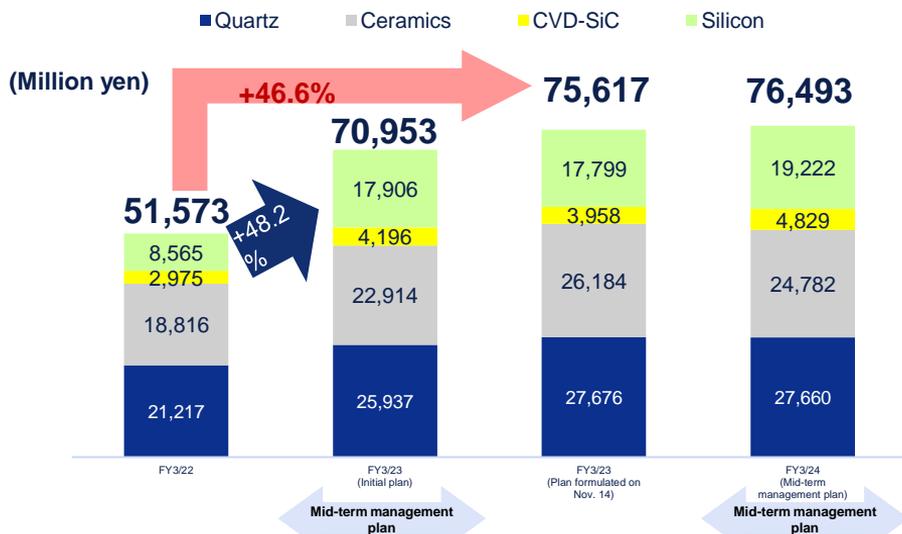
*The strategic products are quartz, ceramics, CVD-SiC, and silicon.



FY3/23 (plan formulated on Nov. 14)
Up 45.6% from the previous year

- In FY3/23, sales are expected to grow 45.6% year on year.
- The semiconductor market is projected to be healthy in FY3/23, thanks to the investment in digital technologies, the growth of demand for EVs, etc.
- As for semiconductor materials, **the demand for consumable materials** is strong, so the ratio of linkage to the **production operation rate** of semiconductor manufacturers is high (some are **investment-linked ones**).
- There is a possibility that the WFE (Wafer Fab Equipment) market will be stagnant in 2023. For the forecast of FY3/24 (the next term), it is necessary to pay attention to this possibility and examine it. (The outlook for the mid/long-term market growth is unchanged.)

Variations in sales





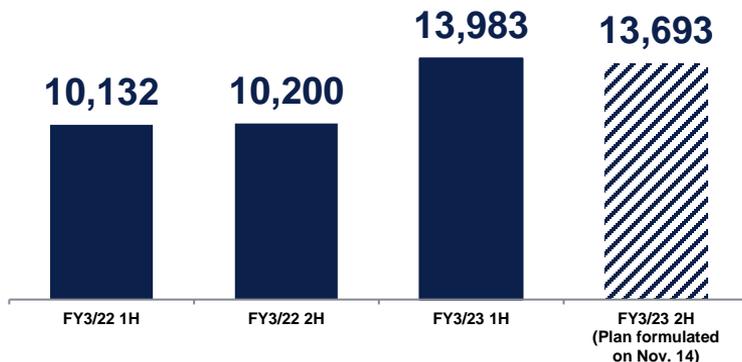
Pyro-processing of quartz by veteran engineers



Machining of quartz, whose production amount will be increased

Variations in sales in 6 months

(Million yen)



In the first half of FY3/23, sales grew 38.0% year on year.

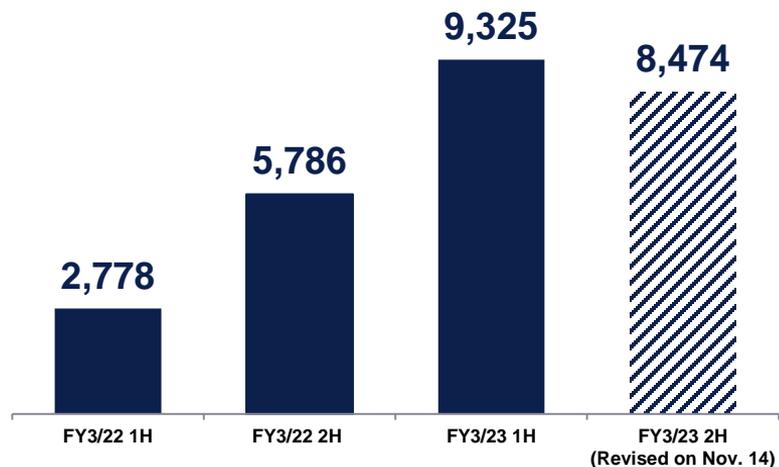
- Full-year sales in FY3/23, which were revised on November 14, are expected to be **down 5.6%** from the initial plan (**up 30.4%** from the previous term).
- In addition to a high level of new investment by semiconductor manufacturing equipment manufacturers and device manufacturers, the demand for consumables is remarkably firm.
- The semiconductor manufacturing equipment market grew year in 2022. However, we must consider the possibility that the market may be stagnant in 2023.
- We have established a system for increasing production output with factories in Hangzhou and Changshan, Zhejiang and Dongtai, Jiangsu, China, and Yamagata City, Japan.

Map of factories for quartz in Japan and China





Variations in sales in 6 months (Million yen)



In the first half of FY3/23, sales grew 235.6% year on year.

- Full-year sales in FY3/23, which were revised on November 14, are expected to be **down 0.6%** from the initial plan (**up 107.8%** from the previous term).
- As miniaturization of parts in the semiconductor process is progressing, the demand for switching to high-purity silicon parts with the same thermal expansion coefficient as silicon wafers is growing.
- To meet the demand from semiconductor manufacturing equipment manufacturers and device manufacturers, the subsidiaries that manufacture these products (Yinchuan and Changshan) are boosting their production capacity.
- In the second half of FY3/23, the demand from some clients will weaken somewhat (due to inventory adjustment, etc.).
- We built factories in Yinchuan, Ningxia, Hangzhou, Zhejiang, and Changshan in China.
- **We are preparing for the listing of the subsidiary in Yinchuan that manufactures silicon parts and quartz crucibles in the Chinese market. (STAR Market, Shanghai)**

Injector



Focus ring



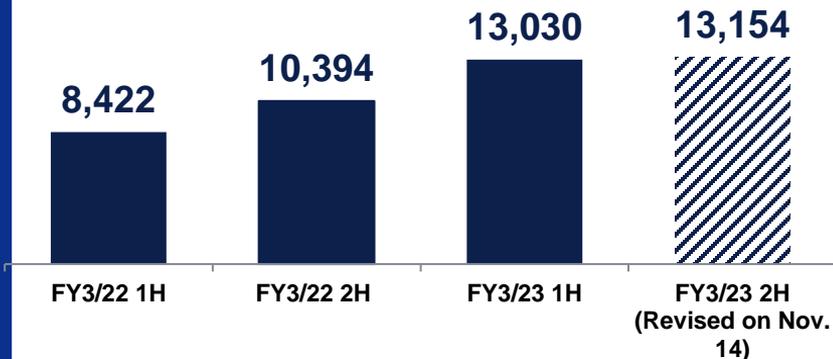


The 2nd factory in Ishikawa (completed in November) Mass production of fine and machinable ceramics



Variations in sales in 6 months

(Million yen)



In the first half of FY3/23, sales grew 54.7% year on year.

- Full-year sales in FY3/23, which were revised on November 14, are expected to be **up 14.2%** from the initial plan (**up 39.1%** from the previous term).
- Completion ceremony of the 2nd factory in Ishikawa was held on November 30, 2022. We enhanced domestic production system for FC and MC.

Fine ceramics (FC), accounting for about 80% of total sales

- Inside and outside Japan, the parts of semiconductor manufacturing equipment are selling well. In response, we plan to enhance the production capacity at the factory in Changshan, Zhejiang, China.

Machinable ceramics (MC), accounting for about 20% of total sales

- The sales of ceramic parts of jigs for semiconductor inspection were healthy inside and outside Japan. We will further enhance the sales of materials of laser-processed (high value-added) products and finished products.

Hyogo: Development and mass-production of fine ceramics



Hangzhou in China: Mass-production of fine ceramics

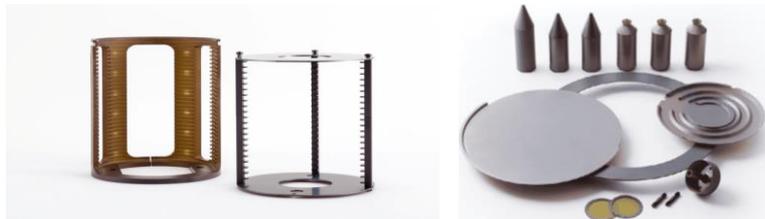


Ishikawa: Mass-production of machinable ceramics



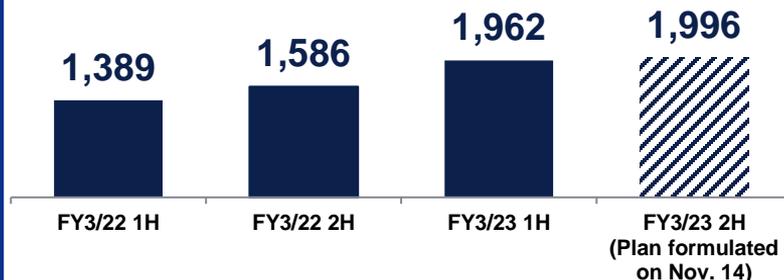
Ishikawa: Development of fine and machinable ceramics





Variations in sales in 6 months

(Million yen)



In the first half of FY3/23, sales grew 41.2% year on year.

- Full-year sales in FY3/23, which were revised on November 14, are expected to be down 0.4% from the initial plan (up 33% from the previous term).
- As for CVD-SiC, we have the advantage in developing “materials and technologies for processing and coating” in Japan. (Okayama Factory in charge of development and mass-production)
- We are responding to the growth of demand for semiconductor manufacturing equipment in Japan and the U.S. and promoting the adoption of our products for new purposes, such as heat-treating furnaces and etcher parts.
- It is essential to increase production capacity in response to the mid-term growth of Chinese client companies.

We will increase CVD furnaces in the Okayama Factory, and plan to start producing CVD-SiC in [Changshan, China](#), in response to the growth of demand in the Chinese market.

Okayama: Development and mass-production of CVD-SiC

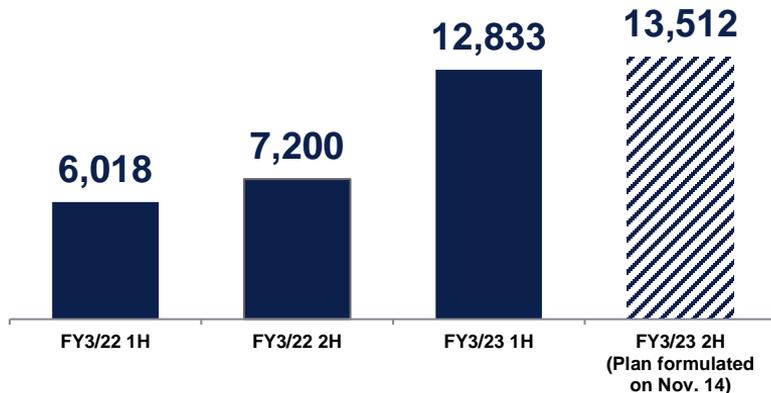


Situation of vacuum feedthroughs and metal processing products and the outlook

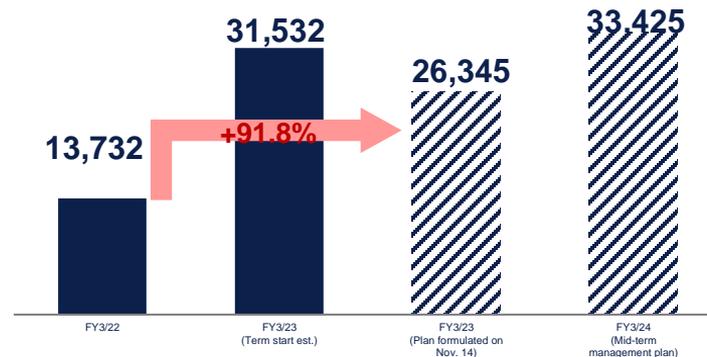


Variations in sales in 6 months

(Million yen)



Variations in full-year sales from FY3/22 to FY3/24

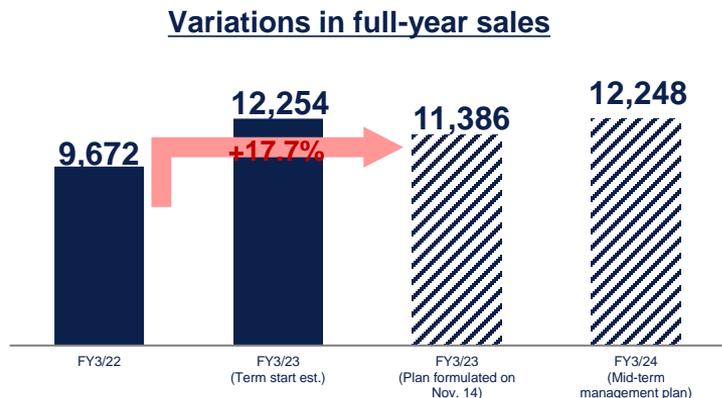
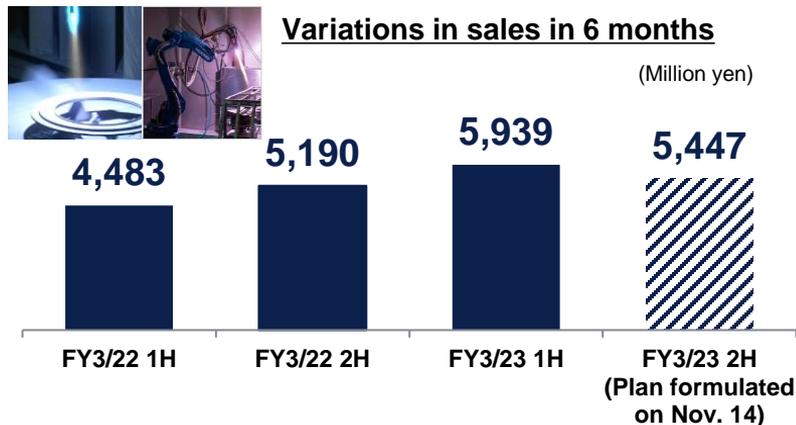


In the first half of FY3/23, sales grew 113.2% year on year.

- Full-year sales in FY3/23, which were revised on November 14, are expected to be **down 16.4%** from the initial plan (**up 91.8%** from the previous term).

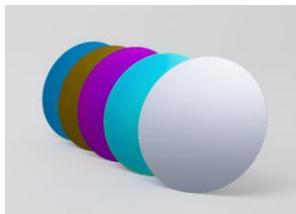
*The sales of the U.S. subsidiary for manufacturing vacuum equipment were initially expected. However, we post the sales in the same segment of deposition equipment, so the initial forecast for sales has been revised downwardly.

- Regarding vacuum feedthroughs, the demand for new investments for semiconductor manufacturing equipment has been healthy.
- Mainly in the Chinese market, etc., the business of undertaking the processing of metal to produce vacuum chambers, robot parts, etc. grew.
- In China, we have manufacturing sites in Hangzhou and Changshan, and we plan to start production at the new site in Malaysia as the business of undertaking the processing of metal continues to grow.



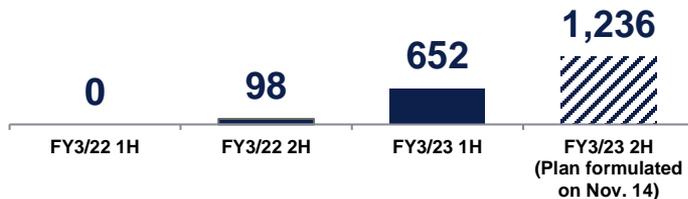
In the first half of FY3/23, sales grew 32.4% year on year.

- Full-year sales in FY3/23, which were revised on November 14, are expected to be **down 7%** from the initial plan (**up 17.7%** from the previous term).
- This business is targeted at the Chinese market. Its scale has been growing steadily year by year, in response to the expansion of production by **semiconductor and FPD (organic EL and liquid crystal) manufacturers**.
- Since this business is **a recurring-revenue type that depends on clients' production operation**, like semiconductor materials, we can readily secure stable sales (**the business is expected to keep growing steadily**).
- We are increasing the cleaning volume with 7 bases and 9 factories. Sales growth became sluggish compared with that at the beginning of the term, due to the reduction of production output of FPD (organic EL/liquid crystal) makers, etc. and we are now coping with the situation.



Wafer recycling factory built in Tongling, Anhui

Variations in sales in 6 months (Million yen)



Variations in full-year sales from FY3/22 to FY3/24



- Full-year sales in FY3/23, which were revised on November 14, are expected to be **up 136.2%** from the initial plan (**up 193.9%** from the previous term).
- **Due to the acceleration of domestic production of semiconductors in China**, the demand for wafer recycling rose sharply. We increased monthly cleaning capacity from 65,000 to **120,000 wafers** in Phase 1 (investment: 7.85 billion yen to **14.02 billion yen**) to meet strong customer demand for mainly 12-inch wafers. *Up to 200,000 wafers are planned.



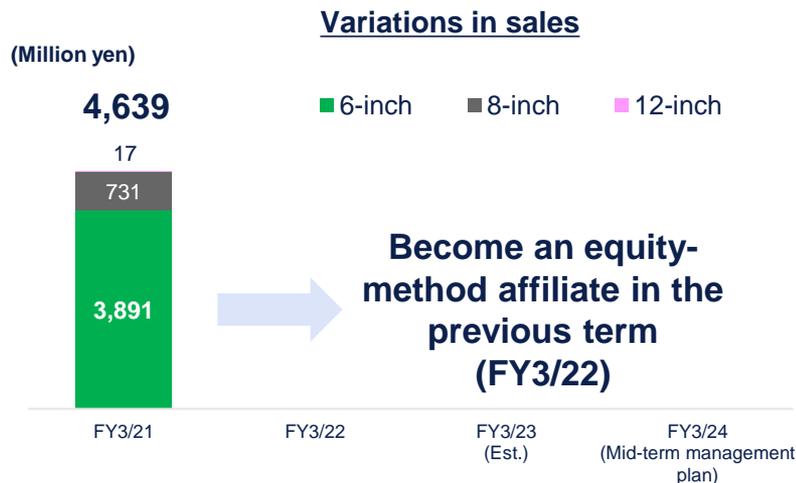
Wafer processing factory in Hangzhou, Zhejiang



Epitaxial wafer processing factory, which is currently under construction in Lishui, Zhejiang (completion image)

*In Lishui, Zhejiang, Zhejiang, CCMC established a factory for **processing epitaxial wafers** as a joint venture with governmental and private funds. (CCMC's investment accounts for 32%.) (Mass-production is scheduled to be started in the first half of FY2023, to produce 100,000 8-inch wafers/month and 200,000 12-inch wafers/month.)

To manufacture 200,000 12-inch wafers per month



- Through the transfer of shares of the subsidiary producing semiconductor wafers (CCMC [former name: FTHW]) and the capital increase through third-party allotment, the shareholding ratio of our corporate group decreased to 23%. <The subsidiary became an equity-method affiliate in 4Q of FY3/21.>
- Due to strong demand for **6-inch products**, **our company plans to add 200,000 wafers per month** to its current production of 500,000 wafers per month (**700,000 wafers per month planned**).
- **We are strengthening the direct sales system of 8-inch wafers.** In Shanghai and Hangzhou, **we will engage in full-scale operation in FY2023.** *The capacity is 450,000 wafers per month.
- As for **12-inch wafers**, we plan to increase the output from 130,000 wafers per month to 200,000 wafers per month by the end of FY2023. (The funds for capital investment will be procured through the capital increase through third-party allotment in China.)

Thermo-electric modules



*As temperature adjustment devices, thermo-electric modules are increasingly used in the fields of automobiles, semiconductor manufacturing equipment, communications, medical biotechnology, consumer products, etc.
(Market share: 36% (largest))



Usage increased for PCR tests
Necessary to check the existence of pathogens that cannot be observed with a microscope by using DNA amplification

Insulating substrates for power semiconductor



*In response to **the global trend of power consumption reduction**, the demand from clients needing power semiconductors is growing. (DIRECT COPPER BONDING technology for bonding a cooper circuit to an alumina ceramics substrate)

Application of power semiconductors



Ferrofluid

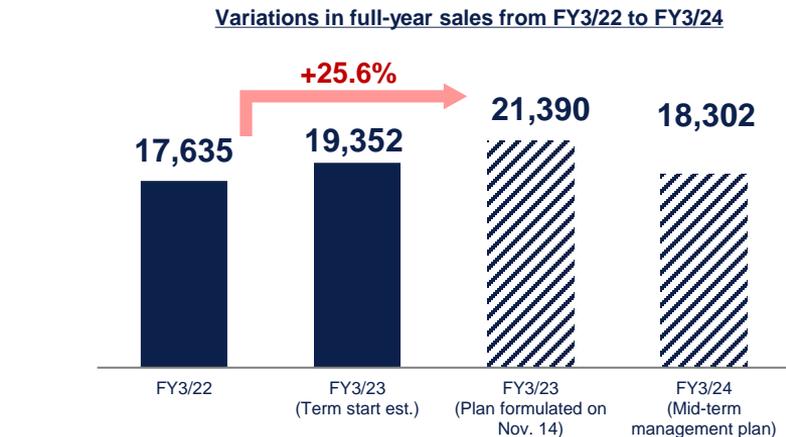
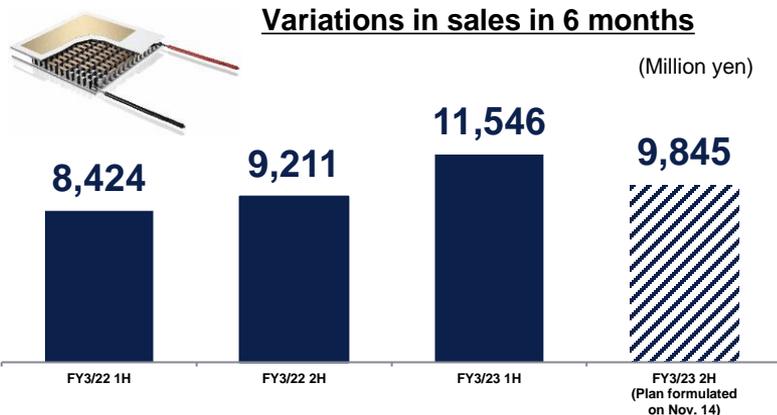


*Used in a wider range of fields, including automobile speakers, high quality sound TV speakers, and smartphone vibration
(Market share: 80% (largest))

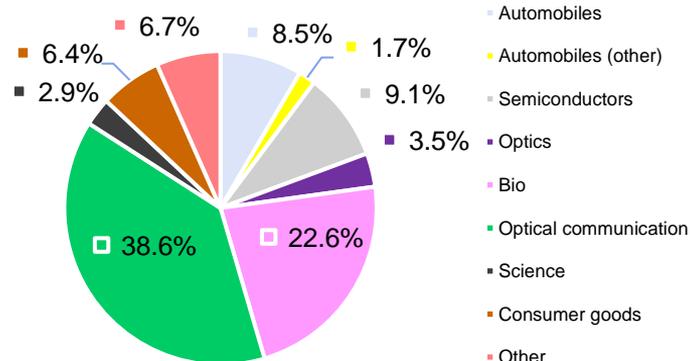
Temperature sensors (thermistors) *Ohizumi Mfg.



*Thermistors are semiconductor ceramics that change resistance significantly according to temperature changes. They are broadly used as temperature sensors for in-vehicle devices, home appliances, optical communications, etc. The demand for them is growing thanks to the electrification of vehicles and digitalization.

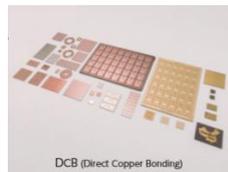


Ratios of purposes of use of thermo-electric modules in 2Q of FY3/23

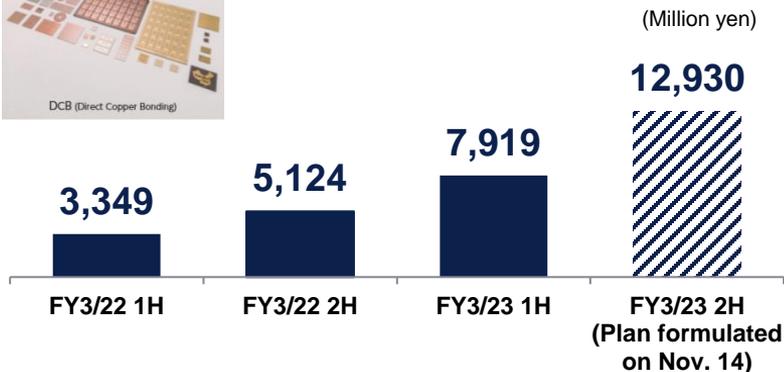


In the first half of FY3/23, sales grew 37% year on year.

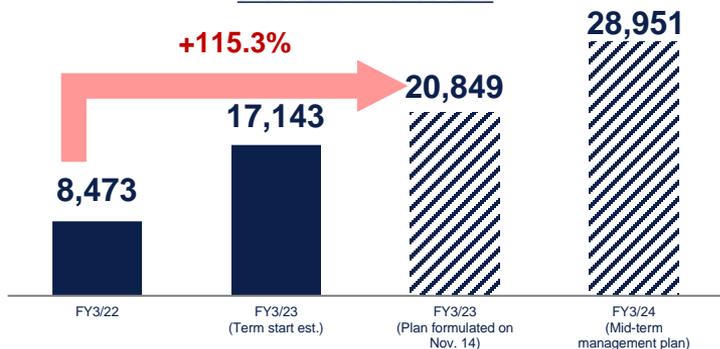
- Full-year sales in FY3/23, which were revised on November 14, are expected to be **up 14.4%** from the initial plan (**up 25.6%** from the previous term).
- The thermo-electric modules for 5G communication devices are selling well, and the sales of products for bio-related equipment, such as PCR testers, and semiconductors are growing.
- The sales of thermo-electric modules for automotive temperature control seats are declining. We aim to expand sales of products for exterior devices, such as cup holders, and products for components for important functions, such as cameras and sensors, which are used for autonomous driving.



Variations in sales in 6 months



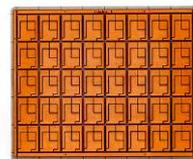
Variations in full-year sales from FY3/22 to FY3/24



In the first half of FY3/23, sales grew 37% year on year.

- Full-year sales in FY3/23, which were revised on November 14, are expected to be up 6.4% from the initial plan (up 115.3% from the previous term).
- We are preparing for the listing of the subsidiary in Dongtai, Jiangsu in the Chinese market.
- We are constructing a new factory in Neijiang, Sichuan (which is scheduled to be completed around May 2023).
- The power semiconductor substrate factory in Dongtai, Jiangsu is expanding its production capacity, and sales are estimated to keep growing in the next and following terms. (Monthly production capacity of Shanghai and Dongtai factories is planned to be increased from **1.1 million substrates to 1.6 million substrates for DCB substrates and from 200,000 substrates to 450,000 substrates for AMB substrates.**)
- We will enhance the measures for selling DPC substrates with high heat resistance and high strength for optical communication, power LED products, etc.

★As the demand for in-vehicle devices grew, the demand for AMB substrates is increasing.



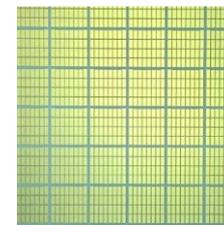
DCB substrates
(Direct Copper Bonding)

Material: Alumina ceramics



AMB substrates
(Active Metal Brazing)

Material: Silicon nitride



DPC substrates
(Direct Plated Copper)

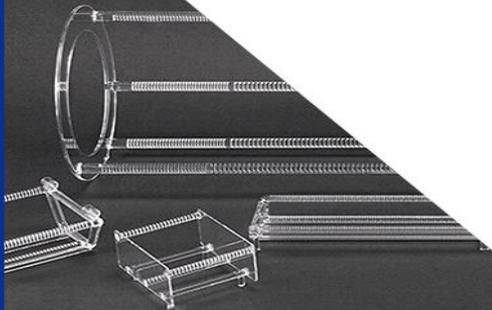
Material: Alumina ceramics, etc.
+
metalization (Ni, etc.)



Ferrotec
Ferrotec Holdings Corporation



Recent topics
New business initiatives, etc.



Acquisition of leading time-honored manufacturers in Japan as subsidiaries and establishment of a joint-venture for expanding business

*Enrichment of our business portfolio for realizing mid/long-term corporate growth

Acquisition of Toyo Knife Co., Ltd. as a subsidiary

***Industrial knives**

- We carried out a TOB, and acquired Toyo Knife as a wholly owned subsidiary in August 2022. (Toyo Knife is included in “Other” business segment of our corporate group).
- Toyo Knife is a time-honored company that was established in 1925 and is the largest in the Japanese field of manufacturing knives for industrial machinery.
- We will establish a production base in the same premises to trigger synergy with our knife business in Hangzhou, fuse technologies and human resources, and strive to cultivate the Chinese market in the information industry, etc.



Posted in “Other” segment.

(As the latest performance, net sales of about 3.2 billion yen have been posted in this segment.)

Acquisition of Ohizumi Mfg. Co., Ltd. as a subsidiary

***Temperature sensors**

- We carried out a TOB, and acquired Ohizumi Mfg. as a subsidiary in August 2022. (Ohizumi Mfg. is included in “Electronic Device” segment of our corporate group).
- By fusing Ohizumi’s mainstay technology for temperature sensors for in-vehicle devices and air-conditioners and our production technology backed by automation and digitalization, we aim to increase sales in the Japanese, Chinese, and EU markets.
- We are planning to boost the capacity to manufacture temperature sensors in Japan and China.



Posted in “Electronic Device” segment.

(As the latest performance, net sales of about 9.6 billion yen have been posted in this segment.)

Establishment of PF-BioLine Co., Ltd. (a joint-venture)

***Measurement of biological materials (bio field)**

- A joint-venture was established in October 2022, while capital contribution ratio is 51% for Precision System Science Co., Ltd. (PSS) and 49% for our company.
- Business description: R&D and sale of products for measuring biological materials by utilizing nanomagnets based on the cooperation between the two companies.
- We will fuse PSS’s technology for automated systems for controlling magnetic body response, PCR testing, immune response testing, etc. and related products and our company’s core technology for ferrofluid, thermo-electric modules, etc.

- Situation of the listing of the subsidiary in Tongling, Anhui in the Chinese market. (To be listed on ChiNext of the Shenzhen Stock Exchange during December 2022 to January 2023.)
- We are increasing our production capacity for Chinese clients of semiconductors and FPDs (in Tongling, Neijiang, and Guangzhou).

★For the equipment parts cleaning, we restructured our organization with the factory in Tongling, Anhui controlling the other factories.

★To offer meticulous services in the vicinity of client facilities (6 bases and 9 factories in 2022 or later)



*We established a new subsidiary named Ferrotec (Guangzhou) Technology Co., Ltd.

Started production in the SiC (Silicon Carbide) business as a joint venture with the Chinese Academy of Sciences and government and private funds

SiC (silicon carbide) wafers (non-consolidated)



- ◆ We established a joint venture with the Shanghai Institute of Ceramics, Chinese Academy of Sciences (SICCAS) and government and private funds in Tongling City, Anhui Province in October 2020. We will develop and manufacture SiC (silicon carbide) single crystal ingots and wafers, whose market is expected to grow as they will be used for the most advanced semiconductors (3rd generation semiconductors) in China.

*Completion ceremony was held on October 29, 2021.

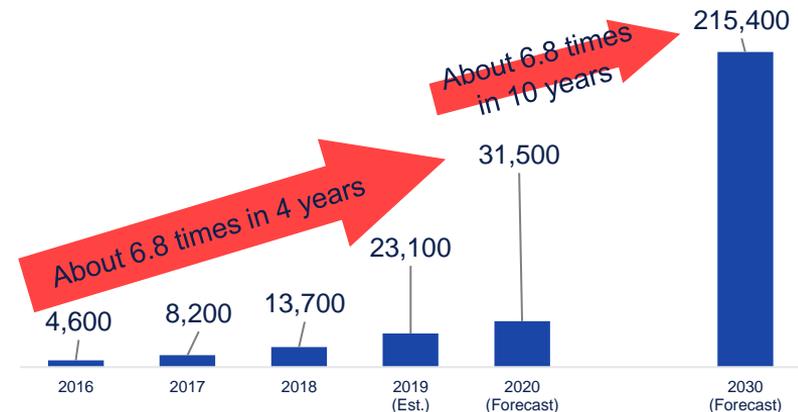


Current situation of the business as a joint venture

- Currently, the company has 110 units of front-end ingot manufacturing equipment and is working on prototyping and certification (plans to establish a system for producing 65,000 4-inch wafers per month).
- The demand is for 5G radio frequency components, power semiconductors for electric vehicles, medical equipment, etc.

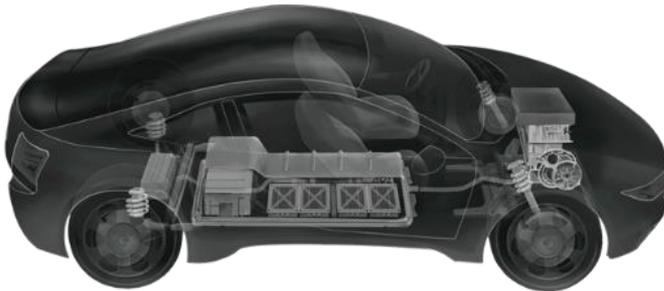
(Million yen)

Forecast for the scale of the SiC wafer market



*The graph is produced by our company with reference to the material of Fuji Keizai.

- With the advance of EVs (electric vehicles) and automated driving, automobiles are becoming more sophisticated and the number of semiconductors installed in them continues to increase.
- **Strategically expanding production capacity of power semiconductor substrates (mainly AMB) in response to the increased EV demand.**
- By making Ohizumi Mfg., which excels at sensor technology, a subsidiary, we started full-scale cultivation of the domestic and Chinese markets in the automotive field.



Our products that can be used for in-vehicle devices



Ferrofluid



Power semiconductor substrates (mainly AMB substrate)



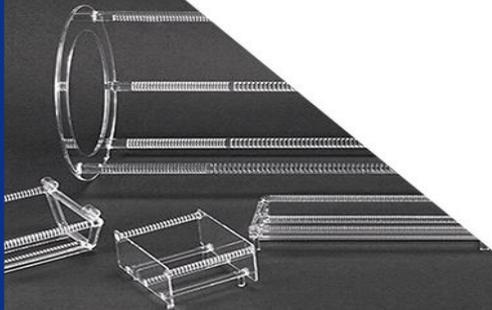
Thermo-electric module



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Appendix



- We will make efforts to cope with various changes in the business environment.

Exchange rate

- In response to the rapid yen depreciation, we have changed the assumed exchange rate from 125 yen/US dollar to 133 yen/US dollar.
- We promoted the diversification of factory sites (such as Malaysia and Japan).

COVID-19

- In the first half of the term, a lockdown was imposed in Shanghai, China, but we strived to continue manufacturing, avoiding the impact on our business performance.

Geopolitical elements

- As of now, it is projected that the impact of the situation in Ukraine on our performance will be minor.
- We keep an eye on the semiconductor market trend that would be affected by the U.S.-China friction. As of now, it has not produced a significant effect on our semiconductor-related business, and we are strengthening our global manufacturing system.

We pursue the stability of business by diversifying our business portfolio.

Skyrocketing of prices of raw materials and energy

- The rise in energy prices, etc. produced some effect, but we curtailed its impact on our business performance, by revising selling prices and reducing costs by automating and streamlining the processes in factories.

Entire group

- Through a TOB, we acquired Toyo Knife Co., Ltd. as a wholly-owned consolidated subsidiary, and it was delisted.
- Through a TOB, we acquired Ohizumi Mfg. Co., Ltd. as a consolidated subsidiary, and its listing status is maintained on the Growth Market of TSE (51%).
- We will establish a joint-venture for devices for measuring biological materials with Precision System Science Co., Ltd.

Capital investment

- We started constructing a new factory in Malaysia and held a groundbreaking ceremony in August.
- We decided to invest in the production increase of silicon parts and quartz crucibles.
- We decided to construct a new factory for manufacturing more power semiconductor substrates in Neijiang, Sichuan.

Listing of subsidiaries

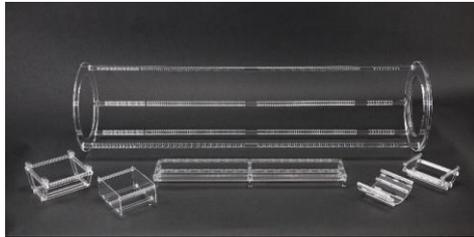
- The equity-method affiliate that manufactures semiconductor wafers (CCMC) applied for listing on the STAR Market of the Shanghai Stock Exchange.
- The subsidiary that manufactures quartz crucibles and silicon parts (FTNC) changed the stock market to the Main Board of the Shenzhen Stock Exchange.
- The Chinese subsidiary that offers cleaning services (FTSVA) received a notification on the final approval for listing from the Shenzhen Stock Exchange in China.

Other

- We received the Supplier Excellence Award in FY 2022 from Lam Research in the U.S.
- We were selected as one of “JPX-Nikkei Index 400.”
- We appeared in the media actively (For details, please see our website).

In October 2022, we received “Supplier Excellence Award in FY 2022” from Lam Research Corp. in the U.S. (for the 3rd consecutive year). Highly evaluated in the category of “scaling (active investment in equipment, next-generation technologies, etc.)”

We will keep offering high-quality semiconductor-related parts and services from our production bases in Japan, the U.S., China, Malaysia, etc.



Quartz



Ceramics



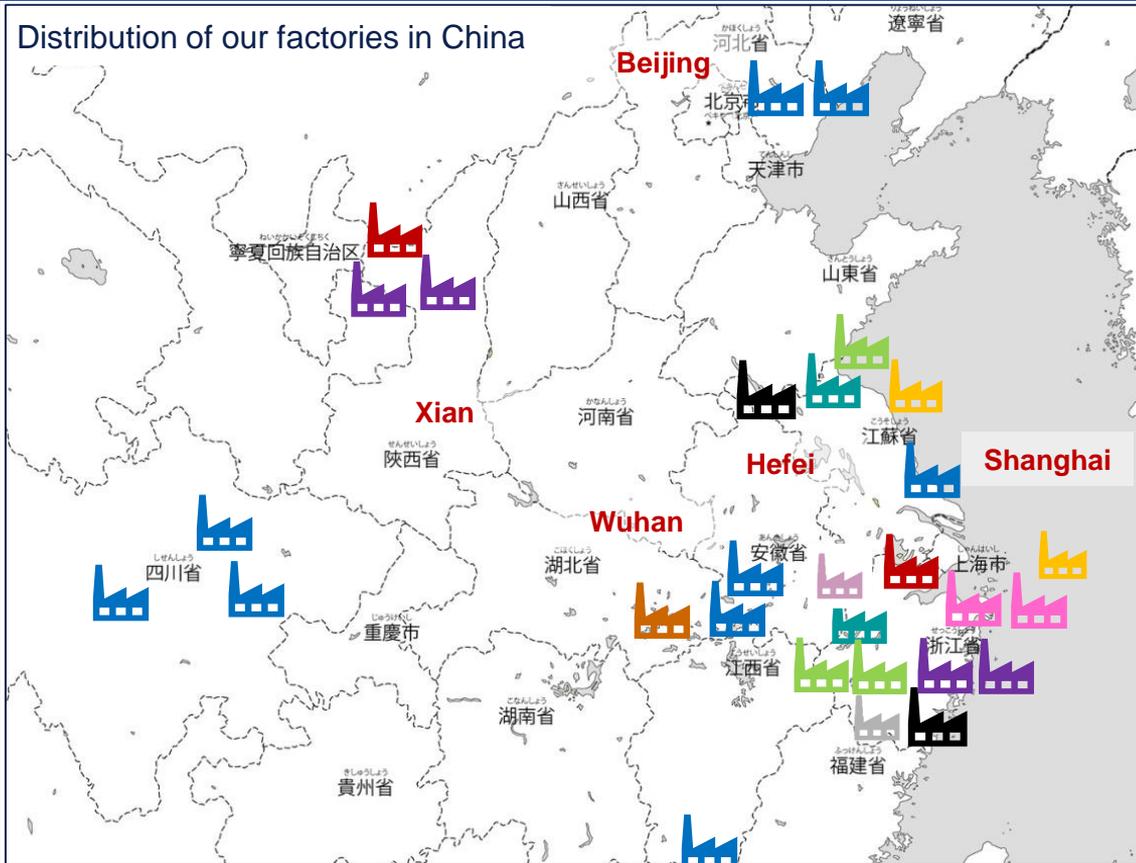
Silicon parts



Metal processing and assembly

Map of production bases of Ferrotec Group in China

Distribution of our factories in China

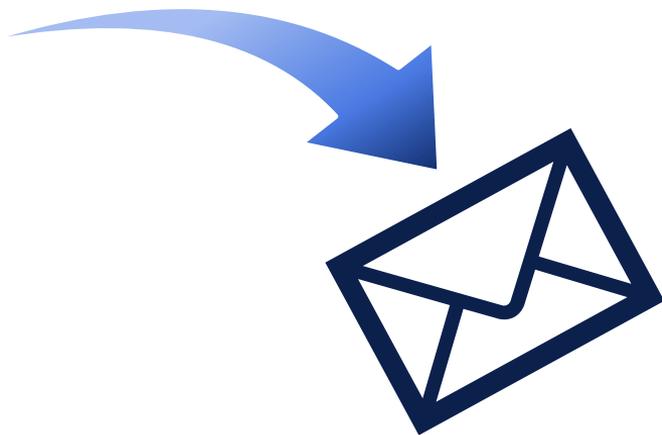


We will contribute to the growth of the market assuming domestic production and expand business by establishing production bases in the vicinity of major footholds of Chinese semiconductor enterprises and improving customer satisfaction.

-  Quarts
-  Silicon parts
-  Ceramics
-  CVD-SiC
-  Thermo-electric modules
-  Power semiconductor substrates
-  Semiconductor wafers
-  SiC wafers

-  Parts cleaning
-  Vacuum feedthroughs and metal processing
-  Wafer recycling
- Letters in red show major footholds of Chinese semiconductor enterprises**
- (1)Beijing (2)Shanghai**
- (3)Wuhan (4)Hefei**
- (5)Xian**

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- The forward-looking statements in this document are based on information available as of the date of publication of this document and assumptions concerning uncertain factors affecting future results.
- Actual results may differ materially from these forecasts due to various factors. Such factors include, but are not limited to, international conditions, economic conditions, product supply and demand trends, raw material prices, market conditions, and exchange rates.
- Quantitative targets and capital investments in these materials represent medium-to long-term strategies and visions, and are not performance forecasts. We undertake no obligation to update any information with respect to these matters.
- For official forecasts, please refer to the disclosure of financial results based on the Tokyo Stock Exchange Regulations.

<Inquiries>

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