

RS Technologies Co., Ltd.

3445

Tokyo Stock Exchange Prime Market

16-May-2023

FISCO Ltd. Analyst

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<https://www.fisco.co.jp>

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Summary

Reclaimed wafers and prime wafers continue to perform strongly and both net sales and operating profit are forecast to set new record highs in FY12/23

RS Technologies Co., Ltd. <3445> (hereafter, “the Company”) conducts reclamation processing of silicon wafers, a major material for semiconductor chips, as its main business, and has the largest global market share with approximately 33% (the Company’s estimate) in 12-inch (300 mm) and 8-inch (200 mm) reclaimed wafers, which are the main sizes. Also, in 2018 in China, GRINM Semiconductor Materials Co., Ltd. (hereafter, GRITEK), which conducts an integrated manufacturing and sales business for prime wafers, was made a subsidiary, and then in 2019, DG Technologies Co., Ltd., which conducts a semiconductor-related consumable materials business, was made a subsidiary; in such ways the Company is continuing to grow while expanding its business areas through M&A. In November 2022, GRITEK was listed on the Shanghai Stock Exchange STAR Market, raising funds of approximately ¥37.5bn which it is investing in future growth. The Company’s investment ratio is slightly more than 40%, including indirect ownership, and its policy is to maintain GRITEK as a consolidated subsidiary in the future as well.

1. Against the backdrop of the strong customer demand, sales and profits increased significantly in the FY12/22 results

In FY12/22 consolidated results, net sales increased 44.0% year-on-year (YoY) to ¥49,864mn and operating profit rose 89.3% to ¥13,018mn, so sales and profits increased significantly and achieved consecutive record highs. Against the backdrop of strong customer demand, results were strong in every business. Particularly, in the wafer reclaim business, net sales increased 41.5% and operating profit rose 54.5%, including due to the effects of the increased production capacities in Japan and Taiwan. Results also grew rapidly in the prime silicon wafer manufacturing and sales business (hereafter, the prime wafer business) being conducted by a Chinese subsidiary, with net sales increasing 53.9% and operating profit rising 136.1%, which was due to the increase in the production volume of 8-inch wafers and the growth in demand for silicon ingots, and it was a major driver of results.

2. Forecasts increased net sales and profit through net sales and operating profit in FY12/23

For the FY12/23 results, the Company is forecasting increased sales and profits, with net sales set to increase 1.8% YoY to ¥50,800mn, and operating profit up 0.6% to ¥13,100mn. The semiconductor market is currently undergoing an adjustment phase, but demand for reclaimed wafers continues to be strong and full operations are being maintained, while for prime wafers as well, steady growth is expected through the expansion of share of sales of 8-inch wafers in the Chinese market. The impact of the US-China trade friction has applied the brakes to China’s advanced semiconductor field, but GRITEK’s main customers are primarily for analog and power semiconductors and so are outside the scope of this field, and also its share of the 8-inch wafer market is still low at around 10% so there remains plenty of room for growth by increasing its share. The silicon ingot business, which rapidly grew in the previous period, entered an adjustment phase in the previous period and the future remains unclear, which seems to be the reason why the Company has set conservative forecasts for results overall. The anticipated exchange rates are ¥130/USD, ¥19.9/RMB, and ¥4.4/NTD, and the yen weakening by ¥1/USD is a factor increasing profits by around ¥20mn.

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Summary

3. Will start mass production of 12-inch prime wafers from 2024

For FY12/25, the company has set new targets of net sales of ¥57,600mn and operating profit of ¥14,700mn. The three-year compound annual growth rates (CAGR) are 4.9% for net sales and 4.1% for operating profit as it is carefully observing growth in FY12/23, but from FY12/24 onwards, sales and profits will grow at an annual rate of around 6%. The construction of new 12-inch wafer plants in Japan and overseas are planned and demand for reclaimed wafers is expected to grow in the future, while the increase in the sales share of 8-inch prime wafers in China will play a driving role for earnings. Consumable materials for semiconductor manufacturing equipment (dry etching equipment), which are being developed to become the third pillar of earnings, are also forecast to achieve high growth if genuine production certification can be acquired at major equipment manufacturers. Moreover, GRITEK's equity-method affiliate Shandong GRINM RS Semiconductor Materials Co., Ltd. (hereafter, SGRS)* started mass production of 12-inch reclaimed wafers in 2022, and continuing from this, it plans to start mass production of 12-inch prime wafers from 2024. The production of the most advanced semiconductors in China will be difficult in the future due to the impact of the US-China trade friction, but the production volumes of semiconductors other than these are forecast to increase. The Company is working to capture this demand, while for prime wafers as well, it has in its sights increasing sales in overseas markets in the future by utilizing its price competitiveness. As SGRS is an equity-method affiliate, at the current time its effect on consolidated results is negligible, but the Company intends to make it a consolidated subsidiary in the future at the stage when the prospect of it becoming profitable has been established, and it is expected to contribute greatly to consolidated results in a few years' time. Although it is unclear how China's semiconductor industry will trend in the future, the Company's main customers include major semiconductor manufacturers outside of China, so if looking at the situation overall, it is thought that its impact will be minimal. We at FISCO shall continue paying attention to the Company as one of the companies within the semiconductor industry that can be expected to grow above the market average.

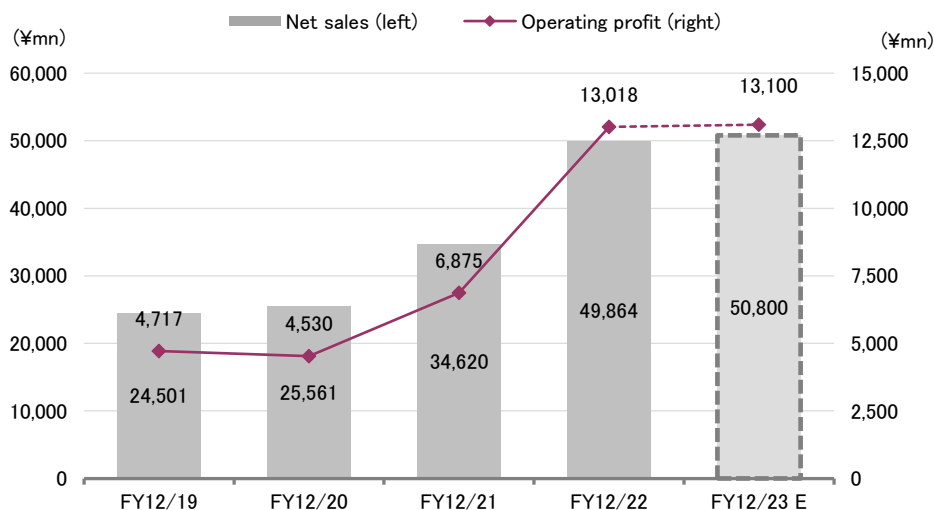
* The Company's investment stake in GRITEK is 19.99% and for its consolidated results, approximately 8% of SGRS net income is recorded in equity in earnings/losses of affiliated companies.

Key Points

- Against the backdrop of the strong customer demand, achieved a significant increase in sales and profits in FY12/22 results
- Demand for both reclaimed wafers and prime wafers is strong and the impression is that the FY12/23 results forecasts are conservative
- Has upwardly revised the FY12/25 targets to net sales of ¥57,600mn and operating profit of ¥14,700mn

Summary

Results trends



Source: Prepared by FISCO from the Company's financial results and results briefing materials

Company overview

Started in the silicon wafer reclamation business and expanding to the prime wafer business and semiconductor-related equipment and materials, etc. business

1. History

The Company was established in December 2010 in order to take over the silicon wafer reclamation business of Rasa Industries, Ltd. <4022>, which had withdrawn from the business, inheriting its equipment and technology. Since then, it has been developing its silicon wafer reclamation business and currently has two plants, the Sanbongi plant in Osaki City, Miyagi Prefecture and the Tainan plant in Taiwan (completed in 2015), which is owned by RSTEC Semiconductor Taiwan Co., Ltd., a subsidiary established in 2014.

Company overview

Also, in 2017, the Company announced that it would be launching a prime wafer business in China, and in 2018, together with Chinese state-owned company General Research Institute for Nonferrous Metals (currently, Grinm Advanced Materials Co., Ltd.; hereafter, GRINM) and Fujian Cangyuan Investment Co., Ltd. (hereafter, Fujian Cangyuan), it established a joint venture, Beijing GRINM RS Semiconductor Materials Co., Ltd. (BGRS). At the same time, BGRS invested in GRITEK, which was a subsidiary of GRINM that manufactured and sold silicon ingots and prime wafers, turning it into a wholly owned subsidiary. The investment ratios in BGRS are 45% for RS Technologies, 49% for GRINM and 6% for Fujian Cangyuan. Although its investment ratio is below 50%, Fujian Cangyuan is an investment company managed by a relative of the Company's President Nagayoshi Ho, so in actual terms, it owns more than 50%, and moreover, has appointed three of the five directors that comprise the BGRS Board of Directors. Therefore, it effectively holds the management rights and BGRS is deemed to be a subsidiary within its scope of consolidation. The reason for the complex investment scheme for BGRS is that, if a Chinese company's investment ratio from local capital is 50% or above, it is treated by the Chinese government and local governments as a domestically funded company and is eligible to receive various types of subsidies and other funding. Such companies also receive preferential treatment in areas like capital investment and taxes, giving them competitive advantages over foreign-funded companies.

In 2018, together with the city of Dezhou, Shandong, GRITEK established Shandong GRINM Semiconductor Materials Co., Ltd. (hereafter, Shandong GRITEK), a joint venture, as a new manufacturing base (investment ratios: GRITEK 80% and Dezhou 20%) and launched the Dezhou plant as a new manufacturing base. The factors behind the decision to establish it included that there are many major semiconductor manufacturers in the area around Shandong Province, in addition to the ease of acquiring excellent human resources as there is a university focused on science and engineering nearby, while benefits can be obtained in terms of infrastructure costs as well, such as reduced utilities costs and inexpensive company housing. Also, in 2020, SGRS, which conducts a 12-inch wafer reclaim business and a prime wafer business, was established as a joint venture by GRINM and a Dezhou City Government-affiliated fund (The Company's initial investment ratio at its establishment was 19.99%. It is an equity-method affiliate, and it currently holds its shares through GRITEK), and it is actively advancing business development in China. In November 2022, GRITEK was listed on the Shanghai Stock Exchange STAR Market. The Company's investment ratio in GRITEK is 40.09% including indirect ownership, but it is considered to have substantial management rights, so it is included among its consolidated subsidiaries, and its policy is to maintain it as a subsidiary in the future as well. As of March 2023, GRITEK's market capitalization was slightly less than ¥400bn and its actual P/E ratio was evaluated to be around 50 times.

The Company has also engaged in buying and selling semiconductor-related production equipment and materials since its founding, and is working to expand its business areas. For instance, in 2018, it acquired shares of Union Electronics Solutions Co., Ltd., a semiconductor trading firm, followed by shares of DG Technologies Co., Ltd., which manufactures and sells semiconductor-related consumable materials (quartz rings and silicon electrodes) in 2019 as wholly owned subsidiaries. In 2020, it established Shanghai Union Semiconductor Co., Ltd. and Beijing Gritek & IVT Valve Technology Co., Ltd. to expand sales of semiconductor-related materials.

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Company overview

The Company's strength in reclaimed wafers lies in the large number of times they can be reclaimed through precision inspection and polishing technologies and in technologies for removing metallic impurities

2. Reclaimed wafers and prime wafers

To appreciate the strengths and growth potential of the Company's mainstay silicon wafer reclaim business and prime wafer business, it is essential to understand the semiconductor manufacturing process and role of silicon wafers as well as the manufacturing methods used to produce them. An explanation is provided below.

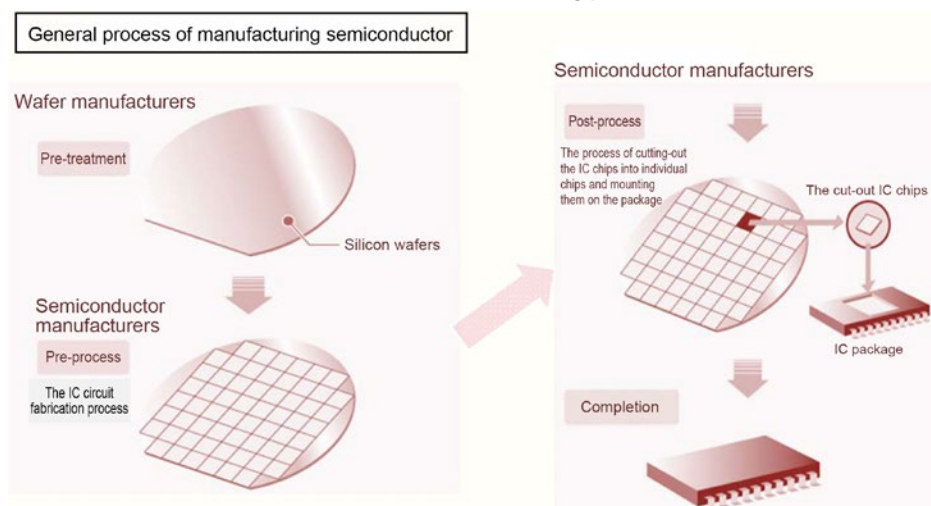
(1) Silicon wafers

A semiconductor is a substance that has electrical conductivity properties halfway between a conductor, which conducts electricity, and an insulator, through which electricity cannot pass. Using these properties, integrated circuits (IC) are manufactured to fabricate highly dense electric circuits. Microprocessing units (MPU), "the brain" of the PC, and memory to store information (such as flash memory and DRAM) are typical examples of semiconductors. They are installed in various applications, including home electrical appliances, telecommunication devices, and automotive electrical equipment, and are also known as the "rice of industry."

Various materials are used in the substrates of these semiconductors according to the required performance, with silicon being among the most widely used. An ingot (meaning a block) of single high-purity silicon is pulled from melted polycrystalline silicon and then sliced into disk-shaped objects called silicon wafers*. Semiconductor manufacturers fabricate detailed circuits on silicon wafers and manufacture semiconductor chips.

* The thickness of a single 12-inch wafer is determined as $775 \mu\text{m} \pm 25 \mu\text{m}$, and several hundred silicon wafers can be obtained from a single ingot.

Semiconductor manufacturing process



Source: Prepared by FISCO from the Company's results briefing materials

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Silicon wafers are becoming larger in diameter alongside the progression of manufacturing technologies, and are currently mass-produced in various sizes, including 5 inches (125 mm), 6 inches (150 mm), 8 inches (200 mm), and 12 inches (300 mm) in diameter. 12-inch wafers are mainly used in state-of-the-art semiconductors that require high integration (miniaturization), but recently are also being used for power semiconductors. Furthermore, not all silicon wafers introduced into the semiconductor manufacturing line are used to manufacture semiconductor chips. Semiconductors are completed by repeatedly creating fine circuit patterns on the silicon wafer, so the manufacturing process is carried out in tandem with tests and evaluations to check the finishing conditions in each process. The silicon wafers used for tests and evaluation purposes have names such as “test wafers,” “dummy wafers,” and “monitor wafers,” (collectively referred to as “monitor wafers” hereinafter in this report), and are primarily made using reclaimed wafers. Conversely, the wafers that are actually processed for semiconductor chips are all new wafers and are generally called “prime wafers” (called “prime silicon wafers” in the name of the Company’s business segment, but refer to the same thing).

(2) Reclaimed wafers

The volume of monitor wafers used seems to be around 20% of the total volume of wafers input into the semiconductor manufacturing line, and basically, monitor wafers input are new wafers. However, in order to reduce the costs of manufacturing semiconductors even by just a little, semiconductor manufacturers are reusing monitor wafers that have been used once and then reclaimed by a reclamation processing business such as the Company. The price of a reclaimed wafer is around 25% cheaper than that of a new wafer, so the wafer input costs can be reduced significantly simply by using reclaimed wafers as the monitor wafers. Of the total number of monitor wafers, it seems the percentage of reclaimed wafers is approximately 80%.

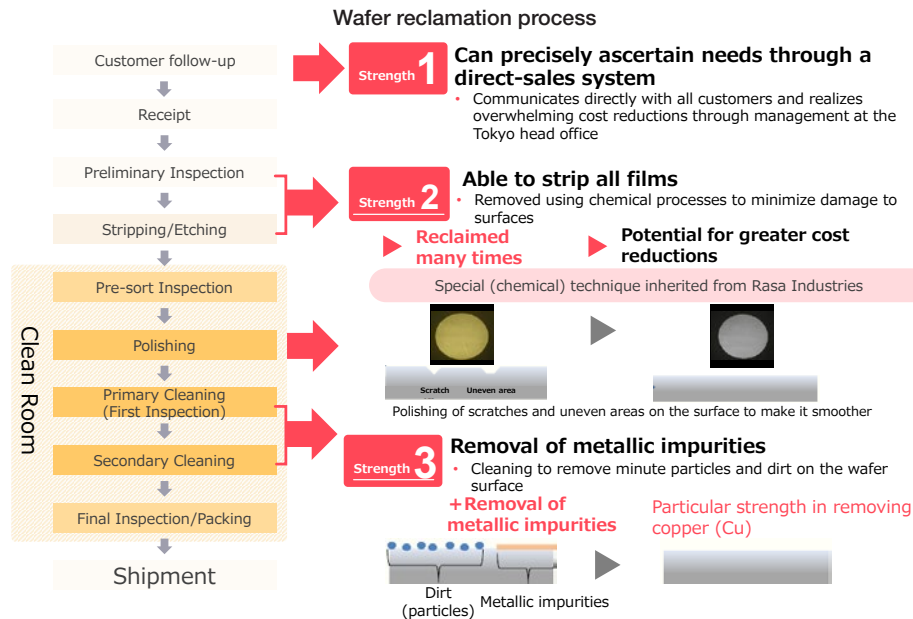
In the wafer reclamation process, an acceptance inspection is conducted and all elements, such as the insulating film formed in the semiconductor manufacturing process, are removed. After that, polishing is performed in a clean room to ensure that the surface of the wafer is completely flat, followed by precision cleaning, and then shipment. The Company’s strengths can be summarized as the following three points. The first is that it can precisely ascertain needs by communicating directly with all customers through a direct-sales system (it can hold technical meetings with customers’ engineers in the main languages) and it can also realize major cost reductions through management at its Tokyo head office. The Company’s second strength is its technological capabilities, as in the film removal process, it can strip all the film through a chemical process and perform precision polishing that keeps any damage to the wafer’s surface to the absolute minimum. This increases the number of times a wafer can be reclaimed from 20 to 30 times, which is around double the industry average. The thickness of a 12-inch prime wafer is approximately 775 μm , and it is said that up to around 630 μm can be used for a monitor wafer. Therefore, the less the amount of the wafer’s thickness that is removed by polishing in a single reclamation process, the higher the number of times it can be reclaimed. The Company’s third strength is that it has technologies to remove metal impurities. In particular, it has been certified by many semiconductor manufacturers to remove copper (Cu) as the only supplier capable of polishing wafers to a degree of cleanliness that is as good as new. This means that even for monitor wafers, which are used in the copper (Cu) wiring formation process, it can reuse them in other processes (its competitors are unable to completely remove copper impurities, so they can only reuse them in the copper wiring formation process).

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Source: Prepared by FISCO from the Company's results briefing materials

(3) Prime wafers

Prime wafers are the same as new wafers. Wafer processing consists of front-end processing, which includes silicon crystal ingot pulling, and back-end processing, which includes slicing wafers from ingots into disk-shapes and polishing the surface of the wafers. While all these processes require advanced technology, the success of silicon wafer manufacturing businesses depends largely on front-end processing yields. Production yield does not merely refer to the number of units that can be produced per hour. The more important factor is the number of good quality prime wafers (homogeneous purity, oxygen concentration, resistance value, etc.) that can be produced from one silicon crystal ingot. This is because even for new wafers, the grade is determined by quality in the same way, and if certain standards are not met, they are sold at a low price as monitor wafers. (The price of a monitor wafer is around 30% cheaper).

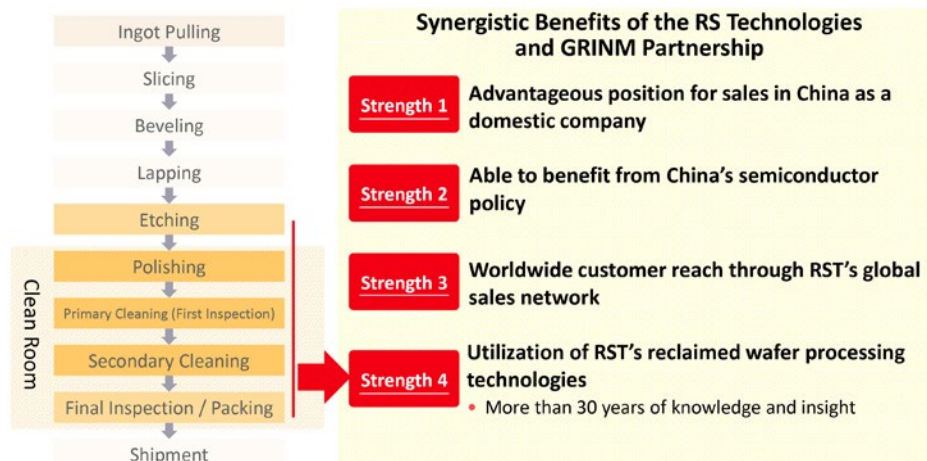
Shandong GRITEK of China manufactures and sells prime wafers. One of its strengths is that, as previously stated, it can utilize various preferential treatment systems as a domestically funded company, and that the Company could benefit from various Chinese government measures given that the semiconductor industry is being developed as a national policy. In technology, the Company leverages its industry-leading technology capabilities cultivated over many years in the wafer reclamation business in back-end polishing and cleaning processes. It appears to have its work cut out for now in simply dealing with increases in semiconductor production in China. But looking to the future, it is aiming to improve the quality of its products to the global standard and to sell to the semiconductor manufacturers around the world through the Company's sales network.

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Prime wafers



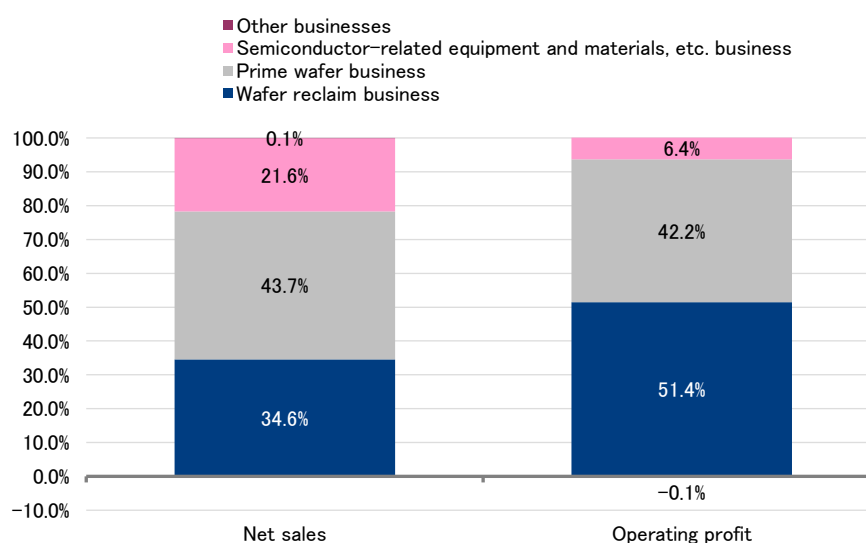
Source: Prepared by FISCO from the Company's results briefing materials

The wafer reclaim business has a leading share of the 12-inch wafer market, at approximately 33%, and its main customers include TSMC, Kioxia and Sony

3. Business description

The Company classifies its business operations into three business segments, specifically the wafer reclaim business, prime wafer business, and semiconductor-related equipment and materials, etc. business, and other businesses, and discloses information on each segment. Looking at the composition of results by business segment in FY12/22, the wafer reclaim business provided 34.6% of net sales and 51.4% of operating profit, and the prime wafer business provided 43.7% of net sales and 42.2% of operating profit. These two businesses are the Company's core earnings drivers.

Composition of results by segment (FY12/22)



Source: Prepared by FISCO from the Company's financial results

We encourage readers to review our complete legal statement on "Disclaimer" page.

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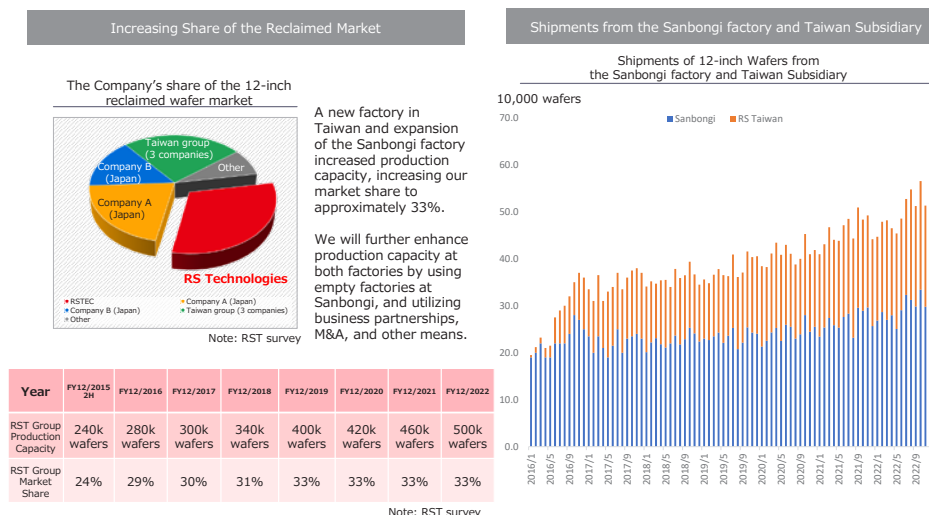
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(1) Wafer reclaim business

The wafer reclaim business is conducted by the Company and its Taiwanese subsidiary, but from FY12/22 2Q, the equity-method affiliate SGRS also began mass production of 12-inch reclaimed wafers. Only the Company is conducting this business with three bases in Japan, Taiwan, and China. The monthly production capacity for the mainstay 12-inch wafers at the end of December 2022 was 500,000 wafers in total, comprised of 300,000 wafers in Japan (also has a capacity for 150,000 8-inch wafers) and 200,000 wafers in Taiwan, in addition to capacity for 50,000 wafers in China. In terms of the composition of sales, the 12-inch wafer provides the majority, at around 85%. According to the Company's estimate, it has the leading global market share on a volume basis, of approximately 33%. In addition to the previously described sophisticated reclaim processing technologies, it thoroughly reduces costs through a direct-sales system and provides services with high levels of customer satisfaction by communicating closely with customers, and these strengths are considered to lead to its high share. It has two competitors in Japan, HAMADA HEAVY INDUSTRIES Ltd. and MIMASU SEMICONDUCTOR INDUSTRY CO., LTD. <8155>, while its overseas competitors are three Taiwanese-owned companies. These six companies form an oligopolistic market that hold roughly 90% of the total market share, and therefore it can be said that that price competition is unlikely to occur as a feature of this industry's structure.

Monthly output volume and share of the 12-inch reclaimed wafer market in the wafer reclaim business



Source: Prepared by FISCO from the Company's results briefing materials

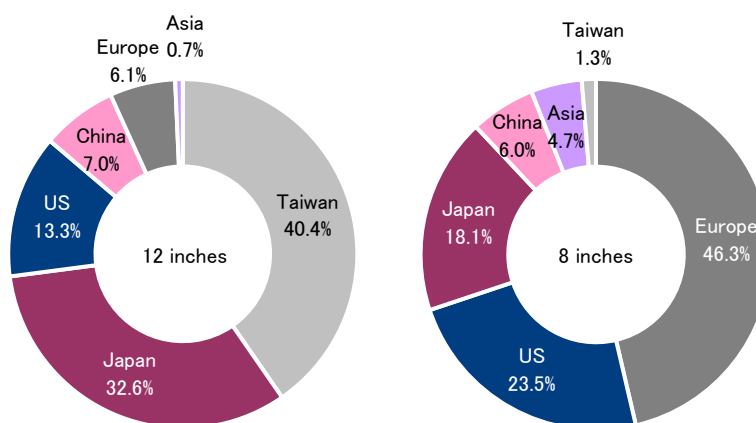
Furthermore, the breakdown of the number of wafers shipped by region (FY12/22) is as follows. For 12-inch reclaimed wafers, Taiwan provides 40.4% and Japan 32.6%, so these two countries provide around 70% of the total. Meanwhile, 8-inch reclaimed wafers stand out for having higher numbers for Europe and the US, at 46.3% and 23.5%, respectively. The Company's main customers include major semiconductor manufacturers, such as TSMC <TSM> in Taiwan, Sony Semiconductor Manufacturing Corporation and Kioxia Corporation in Japan, Intel <INTC> and Micron Technology <MU> in the US, and STMicroelectronics International N.V. <STM> and Infineon Technologies in Europe. Shipments of 12-inch reclaimed wafers for China were previously from Japan and Taiwan. But this will be sequentially shifted to SGRS, which started mass production from 2022, and the strategy is to use the resulting excess capacity at the plants in Japan and Taiwan to cover the demand from other regions.

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Breakdown of shipment volume in the wafer reclaim business by region (FY12/22)



Source: Prepared by FISCO from the Company's results briefing materials

(2) Prime wafer business

Prime wafer business is covered by the Chinese subsidiary GRITEK, and around 40-50% of net sales consist of prime wafers, while silicon ingots and semiconductor-related consumable materials make up the remaining 50-60%. Prime wafer monthly production capacity at the end of December 2022 totaled 50,000 5-inch wafers, 150,000 6-inch wafers, and 130,000 8-inch wafers at the Dezhou plant. Chinese semiconductor manufacturers are the main customers for prime wafers, and slightly more than 70% of sales are for analog and power semiconductors, such as those installed in home appliances and vehicles. Its share in China is still low and the Company estimates that its share of the 8-inch market is around 10%, but it plans to grow share in the future by increasing the production capacity. The Company sells consumable materials and ingots in overseas markets as well, and ships some consumable materials to DG Technologies.

(3) Semiconductor-related equipment and materials, etc. business

The semiconductor-related equipment and materials, etc. business includes sales of semiconductor manufacturing equipment and semiconductor materials as well as parts that are purchased and sold by the Company and sales by subsidiaries Union Electronics Solutions and DG Technologies. It mainly purchases the semiconductor manufacturing equipment from Japanese semiconductor manufacturers and others (including some used products), and primarily sells them to semiconductor manufacturers in the United States, Europe, Japan, Taiwan, China, South Korea, and other markets around the world.

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Union Electronics Solutions is a semiconductor trading firm that mainly handles power semiconductors from Hitachi Power Semiconductor Device, Ltd. and MCUs from Renesas Electronics Corporation <6723>. It opened a Shanghai office in 2020 and plans to expand sales of semiconductor-related products after the spread of COVID-19 infections settles down. DG Technologies manufactures and sells semiconductor-related consumable materials (quartz rings and silicon electrodes, etc.) for dry etching equipment, which is a type of semiconductor equipment. Customers include major domestic and overseas semiconductor device manufacturers and domestic and overseas semiconductor manufacturers. Its production sites are the Kamisu plant (Ibaraki Prefecture) and it also opened the Kurihara plant (Miyagi Prefecture) in May 2021 and it has started production for some processes, while in June 2022 it completed the construction of the new plant that is able to carry out integrated production. The operations of the new plant have approximately doubled the monthly production capacity, as it has increased productivity by introducing automation equipment.

(4) Other businesses

The sales of other businesses are comprised of revenue from electricity sales from the solar power generation business started in 2013 (power generation capacity of approximately 1.59 MW) and technical consulting services and other services provided by the Company in the semiconductor wafer manufacturing process. However, its effect on results overall is negligible.

Business trends

Against the backdrop of the strong customer demand, achieved a significant increase in sales and profits in FY12/22 results

1. FY12/22 results summary

In FY12/22 consolidated results, the Company reported ¥49,864mn in net sales (up 44.0% YoY), ¥13,018mn in operating profit (up 89.3%), ¥15,500mn in ordinary profit (up 75.5%), and ¥7,739mn in profit attributable to owners of parent (up 134.2%), and all greatly exceeded their initial forecasts and set consecutive record highs.

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Business trends

FY12/22 results (consolidated)

(¥mn)

	FY12/21				FY12/22			
	Results	% of sales	Initial forecast	Revised forecast*	Results	% of sales	YoY	vs. initial forecast
Net sales	34,620	-	37,400	50,300	49,864	-	44.0%	33.3%
Cost of sales	22,749	65.7%	-	-	31,432	63.0%	38.2%	-
SG&A expenses	4,995	14.4%	-	-	5,413	10.9%	8.4%	-
Operating profit	6,875	19.9%	7,600	13,000	13,018	26.1%	89.3%	71.3%
(Subsidy income)	1,836	-	-	-	867	-	-52.7%	-
(Foreign exchange gains)	-47	-	-	-	1,189	-	-	-
Ordinary profit	8,833	25.5%	8,900	16,200	15,500	31.1%	75.5%	74.2%
Extraordinary profit	-1,404	-	-	-	-339	-	-	-
Profit attributable to non-controlling interests	1,432	4.1%	-	-	4,997	10.0%	248.8%	-
Profit attributable to owners of parent	3,304	9.5%	4,800	7,500	7,739	15.5%	134.2%	61.2%
Capital investment value	7,827	-	-	-	5,379	-	-31.3%	-
Depreciation	2,942	-	-	-	3,498	-	18.9%	-
R&D expenses	1,308	-	-	-	1,657	-	26.7%	-

* Figures announced on December 8, 2022

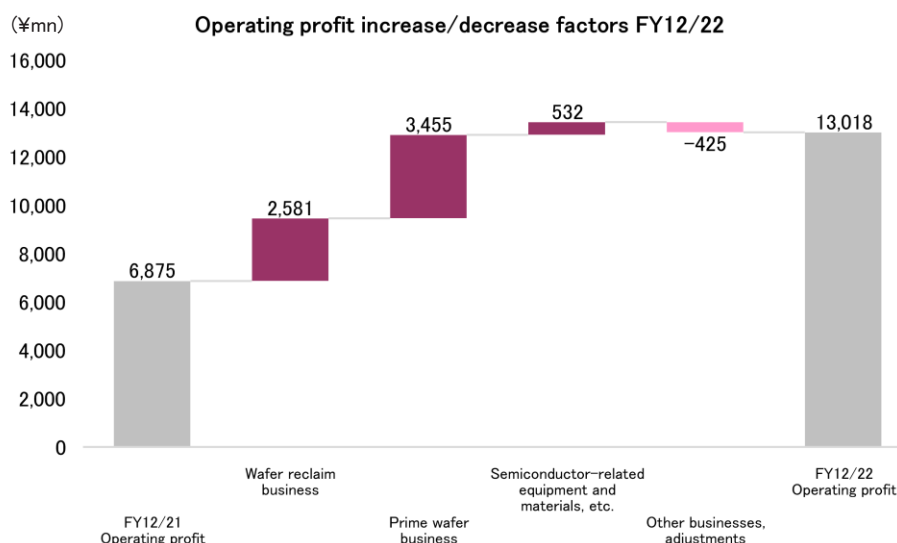
Source: Prepared by FISCO from the Company's financial results and results briefing materials

Against the backdrop of strong customer demand, results were strong and sales increased by double digits in every business, while the weakening of the yen* also proved beneficial. Looking at the contributions to the increase in operating profit, the largest was from the prime wafer business with an increase of ¥3,455mn, followed by the wafer reclaim business with an increase of ¥2,581mn followed by the semiconductor-related equipment and materials, etc. business with an increase of ¥532mn. The cost of sales ratio declined 2.7 percentage points (pp) YoY to 63.0%, due in part to the effects of the operating rate and the improved product mix. The SG&A expenses ratio also declined 3.5pp to 10.9%, because although R&D expenses increased ¥349mn, the Company was able to limit other expenses. As a result, the operating profit margin rose 6.2pp to 26.1%.

* The average exchange rates during the period in the previous period were ¥109/USD, ¥17.0/RMB, and ¥4.0/NTD, but in FY12/22, the yen weakened by 10-24% to ¥135/USD, ¥19.5/RMB, and ¥4.4/NTD (¥/USD are the values announced by the Company and the other values are the TTB-TTS median values at the end of the month). The percentage of sales provided by overseas sales is approximately 80%.

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Business trends



Source: Prepared by FISCO from the Company's financial results

Non-operating profit and expenses improved ¥524mn from the previous period. Subsidy income*¹ decreased ¥968mn, but foreign exchange gains increased ¥1,237mn and financial income and expenses rose ¥277mn. Also, share-based payment expenses of ¥1,404mn*² were recorded as extraordinary loss in the previous period, while in FY12/22 provision for directors' retirement benefits of ¥349mn was recorded. Alongside GRITEK's rapid earnings growth, profit attributable to non-controlling interests increased from ¥1,432mn in the previous period to ¥4,997mn, but profit attributable to owners of parent still increased significantly due to the lowering of the effective tax rate.

*¹ In FY12/21, in relation to the launch of the Dezhou plant, subsidy income was recorded, including for plant relocation expenses (from the Beijing plant to the Dezhou plant), employee recruitment expenses, infrastructure expenses, and 8-inch wafer prototype expenses. However, subsidy income declined in FY12/22 following the decreases of these expenses.

*² The difference between the price per share for the transfer of a portion of GRITEK shares owned by BGRS to GRITEK's employee shareholding association as part of the preparations for the GRITEK IPO in February 2021 and the fair value acknowledged by the corporate auditor was recorded as share-based payment expenses.

Looking at the results by major companies, the Company's non-consolidated net sales increased 26.1% YoY to ¥16,500mn and operating profit rose 56.4% to ¥4,464mn. To respond to the strong customer demand, it increased the monthly production capacity of 12-inch reclaimed wafers by 20,000 wafers from the end of the previous period to 300,000 wafers and of 8-inch reclaimed wafers by 20,000 wafers to 150,000 wafers, increasing sales volume. Partly as a result of the improved productivity, the operating profit margin rose by 5.3pp to 27.1%. At the Taiwanese subsidiary, net sales increased 65.8% to ¥10,008mn and operating profit rose 77.3% to ¥2,825mn. The reasons for the major increases in sales and profits were that the monthly production capacity of 12-inch reclaimed wafers was increased by 20,000 wafers from the end of the previous period to 200,000 wafers, in addition to orders for new monitor-use wafers from specific customers. New monitor-use wafers are shipped as processed silicon wafer products after they are purchased, polished, and cleaned, and their price is around 2 to 3 times higher than normal reclaimed wafers, so they are a factor increasing the average sales unit price. Recently, the tight demand-supply conditions for 12-inch reclaimed wafers have continued, and the Company has handled hardly any new monitor-use wafers. However, sales were made possible because the Taiwanese subsidiary was able to secure a certain volume. The policy is for SGRS's Dezhou plant to ship new monitor-use wafers from 2023 onwards.

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Business trends

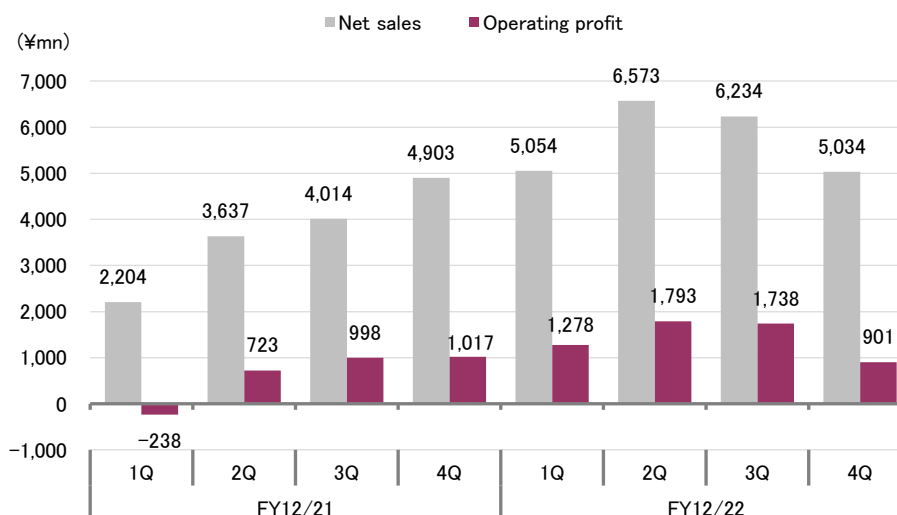
In the Chinese subsidiary, results grew rapidly, with net sales increasing 55.1% YoY to ¥22,895mn and operating profit growing 128.4% to ¥5,710mn. The main factors behind the significant increase in net sales were the rise in the new plant's operating rate and the improved product mix for 8-inch prime wafers, and also because sales, including 6-inch prime wafers, ingots, and consumable materials, grew even more from the 1Q through to the 2Q. The product certification status of 8-inch prime wafers (on a product basis) rose from 30 to 40% in June 2021 to slightly more than 70% in December of the same year and then to around 75% in December 2022. Initially, the plan was to acquire nearly 100% certification by the end of the year, but this has been delayed because inspections at customer plants could not be carried out due to the impact of COVID-19. Looking at how results trended on a quarterly basis, results peaked in 2Q and then decreased compared to the previous quarter. This was because there had been a grouped order for silicon ingots and consumable materials by a customer, so results grew significantly in 2Q and the decrease was a rebound to this increase, and the sales volume of 8-inch prime wafers was maintained at a high level from 3Q onwards.

Business performance trends by company in FY12/22

	The Company		Taiwanese subsidiary		Chinese subsidiary		Other subsidiaries, etc.	
	Results	YoY	Results	YoY	Results	YoY	Consolidated eliminations	YoY
Net sales	16,500	26.1%	10,008	65.8%	22,895	55.1%	461	-
Operating profit	4,464	56.4%	2,825	77.3%	5,710	128.4%	19	-
Operating profit margin	27.1%	5.3pt	28.2%	1.9pt	24.9%	8.0pt	-	-

Source: Prepared by FISCO from the Company's results briefing materials

Chinese subsidiary



Source: Prepared by FISCO from the Company's results briefing materials

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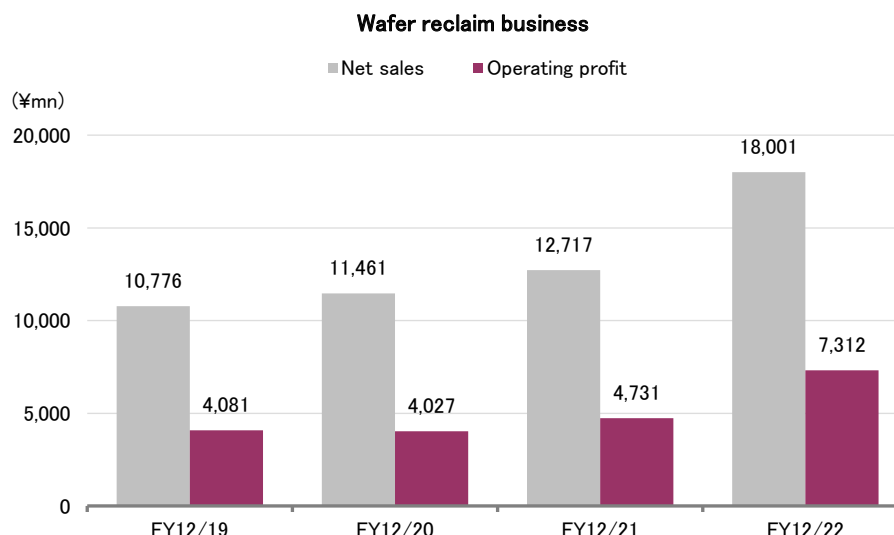
Business trends

Sales and profits increased significantly in every business segment

2. Developments by business segment

(1) Wafer reclaim business

In the wafer reclaim business, net sales increased 41.5% YoY to ¥18,001mn (includes internal sales and the transfer value, same below) and operating profit rose 54.5% to ¥7,312mn, resulting in significant record highs, while the operating profit margin rose to the 40% range for the first time at 40.6%. The factors behind the higher sales and profits included strong demand for reclaimed wafers from customers both in Japan and overseas throughout the year, increased production capacities of 12-inch reclaimed wafers at the Japanese and Taiwanese plants, the spread of higher sales prices, the growth in sales of new wafers to specific customers in Taiwan, and the weakening of the yen. Although sales prices differ depending on the customer, they appear to have risen by several percentage points on average. Also, the overseas sales ratios (on a volume basis) are slightly less than 70% for 12-inch wafers and slightly more than 80% for 8-inch wafers.



Source: Prepared by FISCO from the Company's results briefing materials

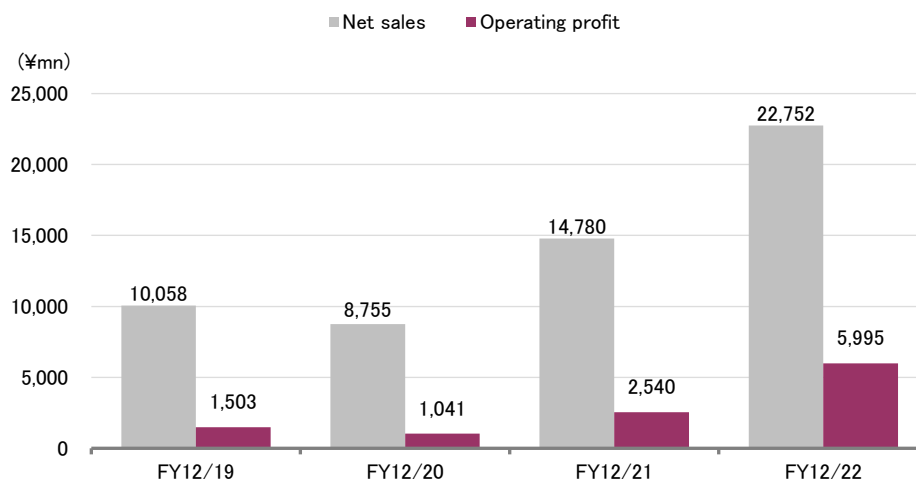
(2) Prime wafer business

In the prime wafers business, net sales increased 53.9% YoY to ¥22,752mn and operating profit rose 136.1% to ¥5,995mn, resulting in significant record highs, while the operating profit margin rose to the 20% range for the first time at 26.3%. The factors behind the higher sales and profits included that, as previously stated, the sales volume of 8-inch prime wafers increased through the progress made in acquiring product certification and also the improved product mix, while in addition, sales of 6-inch prime wafers and ingots and consumable materials were strong up to 2Q and the sales prices of prime wafers continued to rise up to around May 2022 and then trended stably from June onwards. Also, the yen weakened by around 14%, with the average exchange rate during the period in the previous period of ¥17.0/RMB weakening to ¥19.5/RMB, which was a factor that boosted results of the Chinese subsidiaries when converted into yen.

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Business trends

Prime wafer business

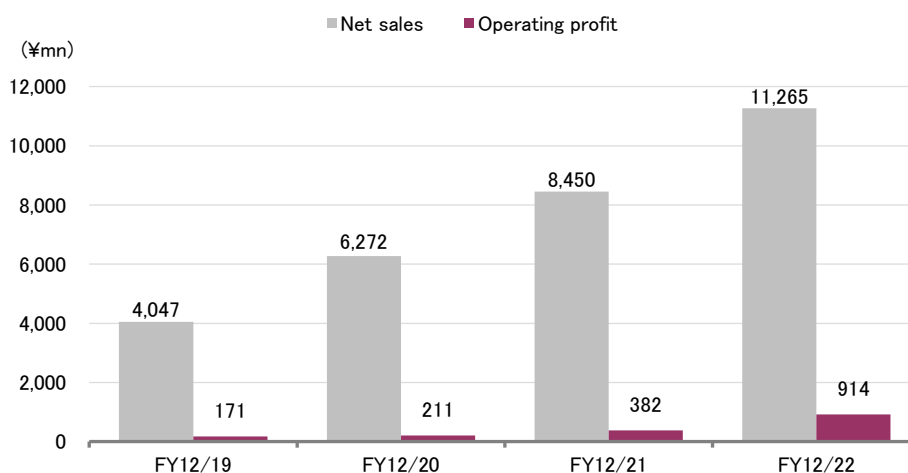


Source: Prepared by FISCO from the Company's results briefing materials

(3) Semiconductor-related equipment and materials, etc. business

The semiconductor-related equipment and materials, etc. business recorded ¥11,265mn in net sales (up 33.3% YoY) and ¥914mn in operating profit (up 139.0%), resulting in significant record highs. This was attributable to a large increase in semiconductor-related equipment procurement sales due to reinforced sales operations, as well as strong sales of semiconductor devices from Union Electronics Solutions and consumable materials for dry etching equipment handled by DG Technologies against a backdrop of strong customer demand. With regards to consumable materials, the new plant (Kurihara City, Miyagi Prefecture), which became the second domestic site, was completed in June 2022 and the resulting increased capacity also led to the increase in sales. In terms of profits, the costs of raw materials for consumable materials rose due to the impact of the weak yen, so results were sluggish at DG Technologies, but overseas sales of semiconductor-related equipment were strong and profits increased significantly.

Semiconductor-related equipment and materials, etc. business



Source: Prepared by FISCO from the Company's results briefing materials

We encourage readers to review our complete legal statement on "Disclaimer" page.

Policy is to allocate the funds raised from the listing of GRITEK to strategic investment

3. Financial condition and management indicators

Looking at the financial condition at the end of FY12/22, total assets had increased by ¥48,557mn from the end of the previous period to ¥127,554mn. The main factors behind these changes were respective increases in cash and deposits of ¥40,173mn from fund raising due to the listing of GRITEK, etc., notes and accounts receivable of ¥2,133mn resulting from expansions to the scope of business, and inventories of ¥2,793mn. In non-current assets, property, plant and equipment increased ¥2,322mn due to the investment to strengthen capacity, while investments and other assets rose ¥1,762mn.

Total liabilities increased ¥2,035mn from the end of the previous period to ¥26,081mn. In current liabilities, there were increases of notes and accounts payable-trade of ¥2,149mn, income taxes payable, etc., of ¥683mn, and short-term loans and long-term loans payable within one year of ¥1,674mn total, while other current liabilities decreased. In non-current liabilities, although deferred tax liability increased by ¥505mn, long-term borrowings decreased by ¥1,582mn. Net assets increased ¥46,521mn to ¥101,473mn. Retained earnings rose ¥7,416mn, including due to the recording of profit attributable to owners of parent, while following the listing of GRITEK and the higher profits, capital surplus increased ¥10,776mn and non-controlling interests rose ¥28,216mn.

Looking at the management indicators, the equity ratio, which reflects soundness, rose slightly, from 36.2% at the end of the previous period to 36.8%, while the interest-bearing debt ratio fell 10.9pp, from 28.4% to 17.5%. Net cash (cash and deposits – interest-bearing debt) also increased significantly, from ¥40,081mn at the end of the previous period to ¥59,730mn. This was mainly due to the fund raising of approximately ¥37.5bn due to the listing of GRITEK, and this can be said to have significantly strengthened the financial base. In the initial plan, it was anticipated that funds of around ¥20.0bn would be raised through the issue of new shares, but the Company succeeded in raising funds significantly higher than was planned because demand was stronger than expected. The plan is for GRITEK to use the funds raised to invest in increasing production of 8-inch prime wafers, and to invest in SGRS's 12-inch prime wafers or to allocate it to acquire shares for M&A and to make SGRS a subsidiary in the future.

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Business trends

Consolidated balance sheet

	FY12/19	FY12/20	FY12/21	FY12/22	Change
(¥mn)					
Current assets	32,760	32,626	45,851	90,470	44,618
(Cash and deposits)	22,156	19,082	27,766	67,939	40,173
(Inventories)	3,984	4,765	6,907	9,700	2,793
Non-current assets	15,873	26,123	33,146	37,084	3,938
Total assets	48,634	58,750	78,997	127,554	48,557
Current liabilities	7,252	12,630	14,218	17,622	3,404
Non-current liabilities	5,400	5,754	9,827	8,458	-1,368
Total liabilities	12,652	18,384	24,045	26,081	2,035
(Interest-bearing debt)	3,634	3,136	8,116	8,208	92
Shareholders' equity	21,409	24,148	26,627	44,961	18,333
Non-controlling interests	15,113	16,443	26,140	54,356	28,216
Net assets	35,981	40,365	54,951	101,473	46,521
[Stability]					
Equity ratio	42.7%	40.5%	36.2%	36.8%	0.6pt
Interest-bearing debt ratio	17.5%	13.2%	28.4%	17.5%	-10.9pt
Net cash	18,521	15,946	19,649	59,730	40,081
[Profitability]					
ROA	12.7%	9.8%	12.8%	15.0%	2.2pt
ROE	15.6%	12.7%	12.6%	20.5%	7.9pt
Operating profit margin	19.3%	17.7%	19.9%	26.1%	6.2pt

Source: Prepared by FISCO from the Company's financial results

Consolidated cash flow statement

	FY12/19	FY12/20	FY12/21	FY12/22
(¥mn)				
Cash flow from operating activities	9,015	6,377	9,337	15,391
Cash flow from investing activities	-6,107	-9,188	-15,614	-1,804
Cash flow from financing activities	4,206	-776	8,069	32,928
Cash and cash equivalents at end of period	21,363	17,910	21,641	66,745

Source: Prepared by FISCO from the Company's financial results

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Forecasts

Demand is strong for both reclaimed wafers and prime wafers, and the impression is that that FY12/23 results forecasts are conservative

1. FY12/23 forecasts

For FY12/23 consolidated results, the Company forecasts ¥50,800mn in net sales (up 1.8% YoY), ¥13,100mn in operating profit (up 0.6%), ¥14,300mn in ordinary profit (down 7.7%), and ¥7,400mn in profit attributable to owners of parent (down 4.3%). The semiconductor market has entered an adjustment phase, but since the beginning of 2023, it seems that demand continues to be strong for the Company's 12-inch reclaimed wafers and China's 8-inch prime wafers. However, it appears to have set a conservative sales forecast because of the impact of the US-China trade friction and since it is unclear when the recovery period for silicon ingots and consumable materials will occur. Costs will rise, including fuel costs and material costs, but the impact of these increased costs will be absorbed by the higher sales, so the outlook is that an increase in operating profit will also be secured. The forecast is for ordinary profit to decrease, because the foreign exchange gain of ¥1,189mn recorded in the previous period will not be recorded in this period and as subsidy income is expected to decline. The anticipated exchange rates are ¥130/USD, ¥19.9/RMB, and ¥4.4/NTD, and the yen weakening by ¥1/USD is a factor increasing profits by around ¥20mn.

FY12/23 consolidated results forecasts

	FY12/22		FY12/23					(¥mn)
	Results	% of sales	1H forecast	YoY	Full fiscal year forecast	% of sales	YoY	
Net sales	49,864	-	24,500	1.3%	50,800	-	1.8%	
Operating profit	13,018	26.1%	6,100	0.8%	13,100	25.8%	0.6%	
Ordinary profit	15,500	31.1%	6,800	-8.4%	14,300	28.1%	-7.7%	
Profit attributable to owners of parent	7,739	15.5%	3,200	-4.0%	7,400	14.6%	-4.3%	
Earnings per share (EPS) (¥)	299.29		123.75		286.18			

Note: The anticipated exchange rates are ¥130/USD, ¥19.9/RMB, and ¥4.4/NTD
Source: Prepared by FISCO from the Company's financial results and press releases

The reason why demand for reclaimed wafers continues to be strong even though the semiconductor market has entered an adjustment phase is that semiconductor production volume and demand for reclaimed wafers are not necessarily linked. For example, should the operating rate of a semiconductor plant fall from 100% to 70%, the volume of input prime wafers will decline 30%, but the volume of input monitor wafers will decrease by only around 5%. This is because when the operating rate declines, semiconductor manufacturers conduct various inspections in order to improve the yield, and they require a certain number of monitor wafers for these inspections. In fact, in the past 20 years, adjustment phases have occurred in the semiconductor market on numerous occasions, but the only time that demand for reclaimed wafers clearly declined was during the global financial crisis from the fall of 2008 to 2009. At that time, the semiconductor industry fell into a recession and one after another the major manufacturers stopped production at their plants, which led to a decline in demand for reclaimed wafers. In other words, as long as the semiconductor market does not deteriorate to the extent that one after another semiconductor plants stop production, demand for reclaimed wafers can be expected to trend solidly. Also, the reclaimed wafers industry is an oligopolistic market in which three Japanese companies and three Taiwanese companies hold an approximately 90% market share and is therefore a market environment in which sales prices are unlikely to collapse, and moreover the Company continues to maintain its competitive advantages for quality and costs, and these are considered to be factors that makes this business highly resistant to economic downturns.

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Forecasts

At FISCO, we think that the semiconductor market's current adjustment phase will end in 1H of 2023 and that in 2H, production volume will also enter a recovery phase. In order to meet customer demand, the Company intends to increase the total monthly production capacity of 12-inch reclaimed wafers in Japan and Taiwan, from 500,000 wafers at the end of the previous period to 540,000 wafers. Sales prices are also trending stably at the same levels as in the previous period, so the forecast is for a single digit net sales increase rate in FY12/23 in the wafer reclaim business.

On the other hand, in the prime wafer business, due to the settling down of the COVID-19 pandemic, product certification of 8-inch prime wafers will rise from the current 70% level to nearly 100% and the product mix is expected to improve. Semiconductor production in China has currently entered an adjustment phase, but much of the decline is for 12-inch wafers, such as those used for memory and logic semiconductors, and it seems that 8-inch wafers, which are mainly used for analog and power semiconductors, are trending comparatively strongly. In addition, GRITEK's share of 8-inch prime wafers in the Chinese market is still small at around 10% and it appears that sales conditions are trending strongly as it is currently in the process of expanding its share. At Shandong GRITEK, the monthly production capacity is forecast to increase from 130,000 wafers at the end of the previous period to 180,000 wafers in 2024, and if steady progress is made in procuring production equipment, its capacity may increase to around 150,000 wafers even during 2023. Therefore, it is highly likely that net sales of prime wafers will continue to trend upwards. Conversely, as previously stated, the adjustment phase of silicon ingots and consumable materials is still ongoing, and going forward the Company will search for demand trends while communicating closely with customers.

Other than the above, for semiconductor-related consumable materials, which is a field that the Company is focusing on within the semiconductor-related equipment and materials, etc. business, sales are forecast to grow, due in part to the effects of the increased production capacity from operations at the Kurihara plant. An issue at the Kamisu plant is improving productivity. At the new plant, productivity is being improved by constructing an integrated production line into which automated processing equipment have been introduced, but at the Kamisu plant, the production equipment is aging and the yield is low, so the Company intends to improve it by strengthening production management in the future. Also, in response to the rise in the costs of raw materials, the Company will focus not only on price-increase negotiations, but also on sales activities for products with high unit prices in order to absorb these higher costs.

Has upwardly revised the FY12/25 results targets to net sales of ¥57,600mn and operating profit of ¥14,700mn

2. Progress made in the medium-term management plan

The Company's FY12/22 results greatly exceeded the initial forecasts and achieved the FY12/25 results targets for the final fiscal year of the four-year medium-term management plan announced in February 2022 (net sales of ¥45,000mn and operating profit of ¥10,000mn) three years ahead of schedule. Therefore, it has set new, upwardly revised targets of net sales of ¥57,600mn and operating profit ¥14,700mn. The increased amount of net sales will be ¥12,600mn and the amount of increase to operating profit will be ¥4,700mn, which are basically increases of the amounts that the FY12/22 results were above forecast. The three-year CAGR appear slightly low, at 4.9% for net sales and 4.1% for operating profit, but this is because the FY12/23 results forecasts seem conservative, and if looking at the span of two years from FY12/24 onward, net sales will grow by 6.5% and operating profit by 5.9%.

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Forecasts

Medium-term results targets

	FY12/22		FY12/23		FY12/24		FY12/25		CAGR (FY12/22- FY12/25)
	Initial forecast	Results	Previous targets	Forecast	Previous targets	Revised targets	Previous targets	Revised targets	
Net sales	37,400	49,864	39,700	50,800	42,400	54,900	45,000	57,600	4.9%
Operating profit	7,600	13,018	8,300	13,100	9,300	14,000	10,000	14,700	4.1%
Operating profit margin	20.3%	26.1%	20.9%	25.8%	21.9%	25.5%	22.2%	25.5%	-
Ordinary profit	8,900	15,500	9,700	14,300	10,800	15,400	11,600	16,100	1.3%
Ordinary profit margin	23.8%	31.1%	24.4%	28.1%	25.5%	28.1%	25.7%	28.0%	-
Profit attributable to owners of parent	4,800	7,739	5,600	7,400	6,300	7,600	6,800	8,000	1.1%
Earnings per share (EPS) (¥)	185.70	299.29	216.64	286.18	243.73	293.91	263.07	309.38	

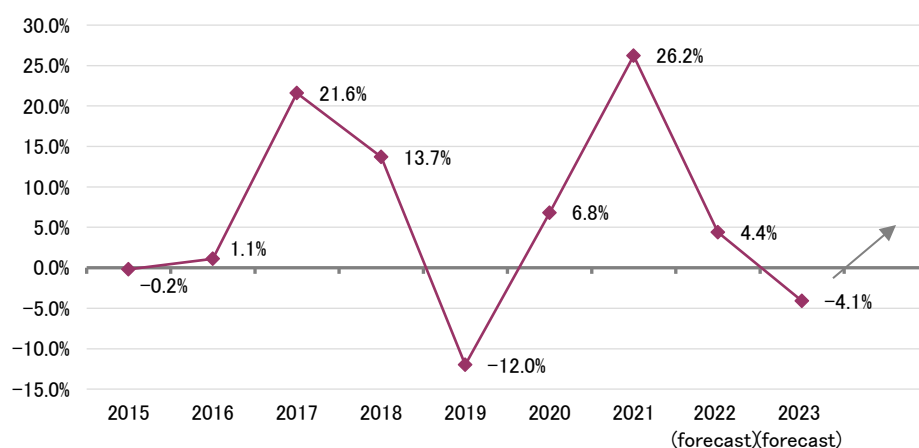
Note 1: Previous targets are the values announced in February 2022. Net income per share reflects the 1:2 share split conducted on December 31, 2022.

Note 2: The anticipated exchange rates are ¥130/USD, ¥19/RMB, and ¥4.4/NTD

Source: Prepared by FISCO from the Company's results briefing materials

In the market forecasts announced in November 2022 by World Semiconductor Trade Statistics (WSTS), the 2022 semiconductor shipment amount growth rate (based on US\$) was downwardly revised from the previous most recent forecast (August forecast) of a 13.9% increase to a 4.4% increase, while for 2023, the rate was downwardly revised from a 4.6% increase to a 4.1% decrease. The main reasons for this were the rising prices of energy and commodities triggered by the Ukraine crisis, and that because of the lockdown in China, demand for electronic products, such as PCs and smartphones, continued to decline, which has caused the demand-supply balance of memory to soften and prices to fall significantly. On entering 2023, economic activities were expected to be revitalized from China lifting its zero COVID-19 policy, but the slump in the consumption mindset has continued due to inflation, and at the present time there is still no sense that final demand is recovering. Therefore, the 2023 growth rate may be even lower than forecast. However, it is highly likely that the production adjustment phase of electronic products will end in the 1H of 2023, so at FISCO we forecast that the semiconductor market will also change to a recovery phase from the 2H of 2023 at the earliest and will return to a growth track from 2024 onwards.

The semiconductor market growth rate

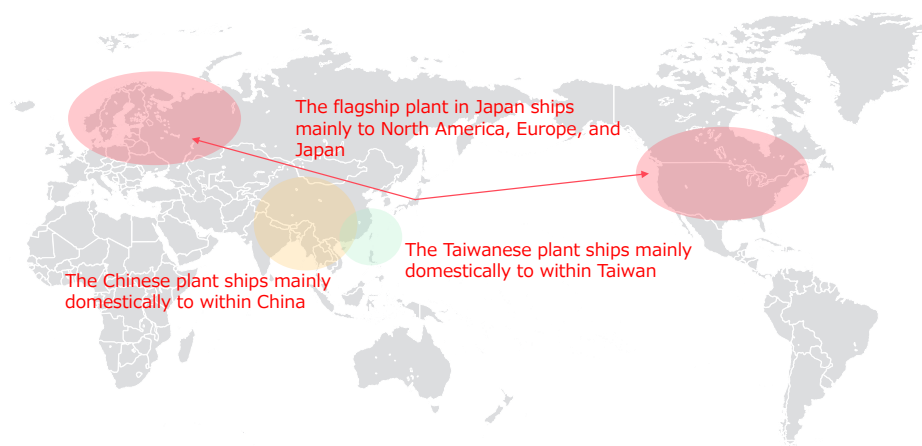


Source: Prepared by FISCO from World Semiconductor Trade Statistics (WSTS) materials: "WSTS Semiconductor Market Forecast Fall 2022" (figures published in November 2022)

Forecasts

Regarding China's semiconductor production, in October 2022 the U.S. Department of Commerce introduced export restrictions on equipment necessary to manufacture the most advanced semiconductor products, and on entering 2023, Japan and the Netherlands also agreed to follow the lead of the U.S., so in the future there is a strong possibility that the construction of new plants in China for the most advanced semiconductors will be put on hold. On the other hand, there are no production equipment export restrictions for legacy semiconductors (such as analog and power semiconductors) with a circuit width of 28nm or higher, so the construction of new plants is possible and they are forecast to continue to grow. According to the Company's survey, going forward there are plans to construct 49 semiconductor plants compatible with 12-inch wafers around the world, and by region, the most are planned for China at 17 plants. Of these, it is uncertain to what extent the plant forecast will be impacted by the current restrictions, but there has been no change to the outlook that semiconductor demand itself will continue to grow in the future, so in regions other than China, the forecast is likely to be that 12-inch semiconductor plants will increase. If all 49 plants become operational, demand is expected to be generated for more than 2.00mn 12-inch prime wafers per month and more than 400,000 reclaimed wafers per month (calculated as 50,000 wafers per month per plant), which will be an excellent opportunity for business expansion for the Company.

Regional strategies for the reclaimed wafers business and the prime wafer business



Source: Prepared by FISCO from the Company's results briefing materials

At FISCO, we think that these export restrictions imposed on China will have hardly any effect on the Company's results. This is because in the wafer reclaim business, the Japanese plant responds to demand mainly from Japan, North America, and Europe, the Taiwanese plant to demand from Taiwan, and the Chinese plant to demand from China. So, the Company has built a system that is unaffected by the US-China trade friction, while the prime wafer business currently only handles 8-inch products that are not subject to these restrictions and its situation is that it is not yet able to fully respond to demand only from local Chinese manufacturers. Also, in the future it is anticipated that in the Chinese market, the 12-inch prime and reclaimed wafers business will be developed by the equity-method affiliate SGRS, and as the targets for prime wafers are legacy semiconductors that are not subject to the export restrictions, it is considered that it will also be unaffected by them. In addition, in the event that in the future it becomes possible to mass produce 12-inch prime wafers compatible with the most advanced products, it will become able to target major overseas semiconductor manufacturers as customers. The Company intends to make SGRS a consolidated subsidiary at the stage when the prospect of it becoming profitable has been established, and in the medium to long term it is expected to play a major driving role behind the Company's results.

Forecasts

(1) Wafer reclaim business

In the wafer reclaim business, the plants in Japan and Taiwan are increasing their production capacities to respond to the strong demand for 12-inch reclaimed wafers. In addition, SGRS's Dezhou plant has started mass production and its strategy is to capture demand in China. The Company is the first company to mass produce 12-inch reclaimed wafers at three bases (in Japan, Taiwan, and China).

The schedule for increasing the production capacity is that in Japan, the 2022 monthly production of 300,000 wafers will be gradually increased to 340,000 wafers in 2025, and in Taiwan from 200,000 wafers to 280,000 wafers. Also, in China, the plan is to increase capacity from 50,000 wafers in 2022 to 100,000 wafers in 2025. Looking at the planned capital investment, in the next three years the Company is planning investment of ¥2.5bn in Japan and ¥3.6bn in Taiwan, which will mainly be used to increase production equipment for low throughput processes. There is room to increase the production lines of both the Japanese and Taiwanese plants, and at the present time the outlook is that they can increase their production capacities simply by investing in additional equipment. On the other hand, the Company has not yet set an investment plan for China for 2024 and onwards. This is because it will be necessary to ascertain how demand for 12-inch wafers will trend due to the US-China trade friction, and it will make a decision from among various options, including outsourcing.

The monthly production capacity of 12-inch reclaimed wafers for the Group as a whole will increase by around 1.3 times, from 550,000 wafers at the end of FY12/22 to 720,000 wafers at the end of FY12/25 (if excluding the Dezhou plant, by approximately 1.24 times to 620,000 wafers), and when converted to an annual rate excluding the Dezhou plant, it will increase by 7.4%. Going forward, if it continues to operate at full capacity and prices trend stably, net sales can be expected to grow at around the same rate. Since FY12/17, the operating profit margin has trended stably in the 35 to 40% range, so it is forecast to trend in the same range in the future as well. It also seems likely that market share will be maintained at the current level of 33% through the Company utilizing its strengths.

Plan to strengthen production capacity for 12-inch reclaimed wafers

Plant	Monthly production capacity at period-end				
	2021	2022	2023	2024	2025
Sanbongi plant	280,000 wafers	300,000 wafers	310,000 wafers	320,000 wafers	340,000 wafers
Tainan plant	180,000 wafers	200,000 wafers	230,000 wafers	260,000 wafers	280,000 wafers
Dezhou plant*	-	50,000 wafers	50,000 wafers	50,000 wafers	100,000 wafers
Total	460,000 wafers	550,000 wafers	590,000 wafers	630,000 wafers	720,000 wafers

* The Dezhou plant is the portion of the equity-method affiliate SGRS
Source: Prepared by FISCO from the Company's results briefing materials

Capital investment plans

Plant	(¥bn)				
	2021	2022	2023	2024	2025
Sanbongi plant	0.9	0.9	1.0	0.2	1.3
Tainan plant	0.8	0.9	1.1	1.0	1.5
Dezhou plant*	3.0	0.5	0.1	Undecided	Undecided
Total	4.7	2.3	2.2	-	-

* The Dezhou plant is a plant of equity-method affiliate SGRS (investment ratio: 19.99%), and the Company was responsible for about 20% of the capital investment
Source: Prepared by FISCO from the Company's results briefing materials

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(2) Prime wafer business

In the prime wafer business, the monthly production capacities of prime wafers at the Dezhou plant of Shandong GRITEK* at the end of FY12/22 were 130,000 8-inch wafers, 150,000 6-inch wafers, and 50,000 5-inch wafers. But going forward, it has set a policy of focusing even more on 8-inch and as previously explained, it intends to increase the production capacity of 8-inch up to 180,000 wafers during 2024. It is planning capital investment of ¥2.0bn in 2023 and ¥400mn in 2024. It currently has its hands full simply responding to demand from Chinese semiconductor manufacturers, but in the future, it has in its sights utilizing its cost competitiveness to enter markets other than China. In fact, it has been highly evaluated by European and U.S manufacturers for its cost competitiveness, and is able to sell as much as it has the capacity to produce. Therefore, at FISCO we think it is fully possible that the production volume of 8-inch prime wafers will increase from 2025 onwards.

| * Investment of 80% by GRITEK and 20% by the Dezhou government. |

Conversely, SGRS, which handles 12-inch prime wafers, has been working to improve quality through a test line on a scale of 10,000 wafers per month at its Beijing R&D building. As a result, it seems that it has cleared all the quality standards at levels able to sell the wafers as products, and at the new plant scheduled to be completed in October 2023, the plan is for production equipment with a capacity of 100,000 wafers per month. It is planning capital investment of ¥24.0bn in FY2023 and ¥2.0bn in FY2024, and of these amounts, GRITEK will be responsible for funds corresponding to its investment ratio (19.99%). For prime wafers, after the production equipment becomes operational, it will be necessary to have technologies for mass production in order to stably mass produce wafers of a least a certain level of quality, so for a certain period it will need to conduct test operations in order to establish these mass production technologies. In terms of the period when it will actually be able to ship, it is targeting 50,000 wafers per month in 2024. There are still no Chinese companies that have succeeded in mass producing 12-inch prime wafers, so it intends to increase its market share by it quickly succeeding at realizing mass production.

Regarding sales strategy, the plan is to meet the quality standard for prime wafers with a circuit width of 28 nm to 40 nm, the volume zone for Chinese semiconductor manufacturers, and to expand sales targeting Chinese semiconductor manufacturers. As policies to expand production capacity, it will not only make new investments, but also decrease prices by acquiring manufacturing equipment at low costs, such as through M&A, and first aim to acquire a top share in the Chinese market. Also as the next step, it plans to meet the quality standard for 14-20 nm prime wafers, the volume zone for the global market, and its strategy is to conduct sales to major semiconductor manufacturers by utilizing price competitiveness achieved through production in China. In its wafer reclaim business, the Company conducts transactions with most of the major semiconductor companies, so if it can meet quality standards and construct a stable supply structure, it is considered that adoption of its products will proceed smoothly due to its competitive pricing advantage. The Company is targeting acquiring a 30% share of the 12-inch prime wafer market in the future.

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In the Chinese market, 12-inch prime wafers are being sold by major overseas companies. Despite large amounts of capital investment by local Chinese companies, the current situation is that they have failed to meet quality standards and have not reached the stage of mass production. It seems they are struggling to achieve ingots with homogenous purity and quality (oxygen concentration, resistance value, etc.) and high yields just as much as before. The Company has invited engineers from major silicon wafer manufacturers to share their expertise with local staff, and it sees quality to be on a level at least as high as in other Chinese local companies. For the polishing and cleaning processes, which are the processes after manufacturing, there are no problems as it can utilize its wafer reclamation technologies, so it seems completely possible mass production could start in 2024. Also, an enormous investment of approximately ¥100.0bn will be required to build the targeted monthly production capacity of 300,000 wafers, so it is considering conducting M&A, including competitors in China, as one option. It is anticipated that it will acquire equipment from companies that are currently struggling to establish technologies for mass production, and the Company thinks that this situation will become possible in a few years' time. It seems that the investment funds will be jointly undertaken by GRINM, the joint-venture partner, and the Dezhou City Government-affiliated fund.

Investment plan for prime wafers in China Shandong GRITEK (consolidated subsidiary)

Shandong GRITEK (consolidated subsidiary)

8 inches	2022	2023	2024
Monthly production capacity (10,000/month)	13	-	18
Capital investment value (¥bn)	*	2.0	0.4

* Investment already carried out up to FY2021

SGRS (equity-method affiliate)

12 inches	2022	2023	2024	202X
Monthly production capacity (10,000/month)	1*1	-	5	30
Capital investment value (¥bn)	*2	24.0	2.0	Undecided

*1 Test line for R&D to realize mass production

*2 Investment already carried out up to FY2021

Source: Prepared by FISCO from the Company's results briefing materials

(3) Pursuit of growth in semiconductor-related consumable materials as a third major income source

To attain its goal of developing a third major income source outside the existing wafer reclaim and prime wafer businesses, the Company's policy is to focus on semiconductor-related consumable materials handled by subsidiary DG Technologies. Specifically, it aims to increase sales of consumable materials, including quartz rings used to hold silicon wafers in dry etching equipment and silicon electrodes.

The Company estimates that the market for semiconductor-related consumable materials is worth about ¥150.0bn annually and has set its sales goal to a 10% share (about ¥15.0bn) for the time being. It is thought that due to the operations of the new plant, net sales increased from the ¥3.0bn range in FY12/21 to the ¥4.0bn range in FY12/22. The operating profit margin remains at a level of low single digits, including because of the impact of the increase in purchasing costs. But in the future, the target is to increase it up to the 30% range, which is the same level as in the wafer reclaim business, from the effects of mass production from the operations of the new plant and the improved productivity at the Kamisu plant.

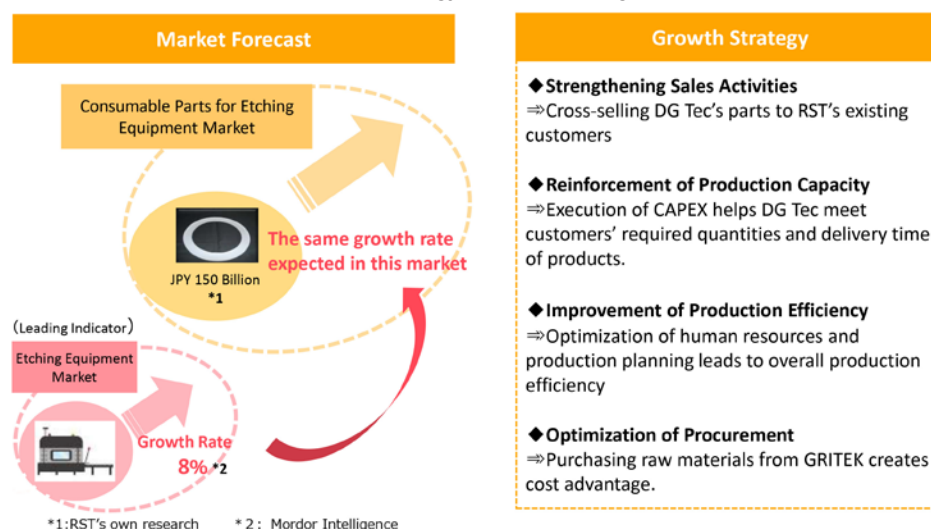
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Despite the presence of multiple competitors in Japan, Taiwan, South Korea, the US, and other countries, the Company's quality and technological capabilities are thought to be at levels which are at least equal to these competitors. Low production efficiency has been an issue in the past due to small-lot manufacturing of a wide range of product types, but the Company is aiming to improve production efficiency, including by installing automation equipment, optimizing personnel assignments, and enhancing production management. At the same time, it aims to reduce costs and strengthen cost competitiveness by inexpensively procuring the silicon it uses as a material from Group company GRITEK as well as through its sales network. On the sales front, it is conducting cross sales for customers in the wafer reclaim business and at the same time, its strategy is to increase its sales share by aiming to acquire genuine product certification from major dry etching equipment manufacturers. Major dry etching equipment manufacturers require the construction of a stable supply structure, in addition to their requirements for delivery times and quality, and the Company is aiming to clear these issues and to acquire certification within 2023 or in 2024 at the latest. The long-term targets are a global market share of around 30% and net sales of ¥45.0bn. The business scale of Techno Quartz Inc. <5217>, a competitor for quartz glass, is net sales of ¥15.8bn and an operating profit margin at the 20% level in FY3/22, and at FISCO, we think that DG Technologies is also capable of raising its operating profit margin to around the 20% level by expanding sales.

Growth strategy of DG Technologies



Source: Prepared by FISCO from the Company's results briefing materials

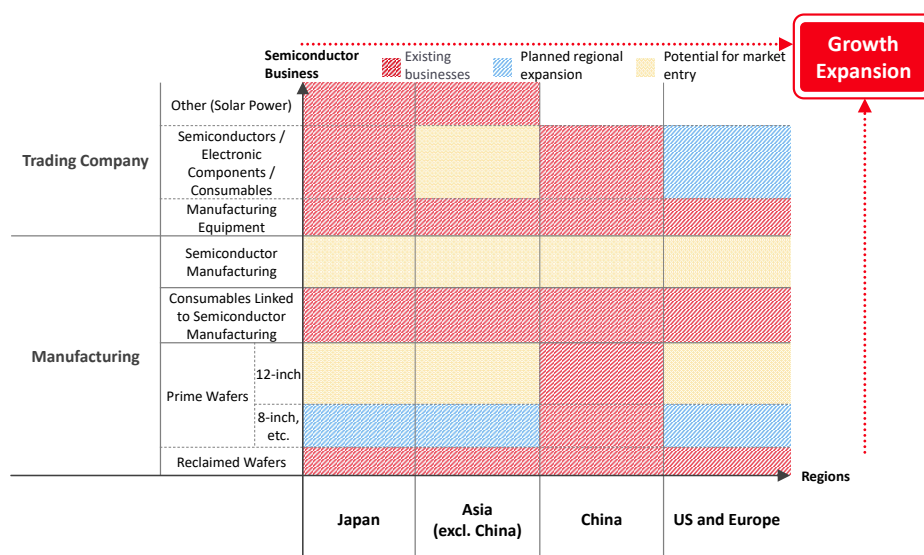
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(4) The long-term growth strategy

As its long-term growth strategy, the Company is aiming for growth greater than that of the semiconductor industry by expanding the sales regions and the business areas of its existing businesses. To expand the sales regions, it intends to conduct sales of 8-inch prime wafers produced in China to regions other than China. It intends to use the funds raised from the listing of GRITEK to increase production capacity and to enter-into markets other than China. Also, if SGRS makes steady progress in its 12-inch prime wafers and reclaimed wafers business, the Company will make it a consolidated subsidiary around 2030, and this is expected to contribute to a further expansion of business scale. Other than the above, as a trading company function, it sells semiconductors, electronic parts, and consumable materials in Japan, China, and other parts of Asia, and it plans to sell these products in the European and US markets as well. On the other hand, it will expand the business areas by conducting M&A. The targets are companies with which synergies with existing businesses can be expected in areas peripheral to semiconductor wafers, while semiconductor businesses are also targets. As the procedure for this, there are expected to be cases of M&A conducted by the Company in which a company that has been invested in by the investment company owned by the President reaches the stage at which it is generating earnings, while also progressing improvements.

Since the Company is the leader in the 12-inch reclaimed wafers market at a roughly 33% global share (the Company's estimate) and already has top semiconductor manufacturers worldwide as customers, it appears to be in a position that facilitates the creation of synergies through cross-selling. While the semiconductor industry experiences major upturns and downturns, the income trend should be relatively stable since the Company's mainstay wafer reclaim business is strongly resistant to such downturns. At FISCO, we think that the Company's strategy of accelerating earnings growth faster than the growth rate of the semiconductor market is feasible by making the wafer reclaim business, in which it has a high market share, into a stable earnings base, and then expanding the prime wafer business and developing the semiconductor-related consumable materials business.

Regional initiatives targeted by the Company



Source: Prepared by FISCO from the Company's results briefing materials

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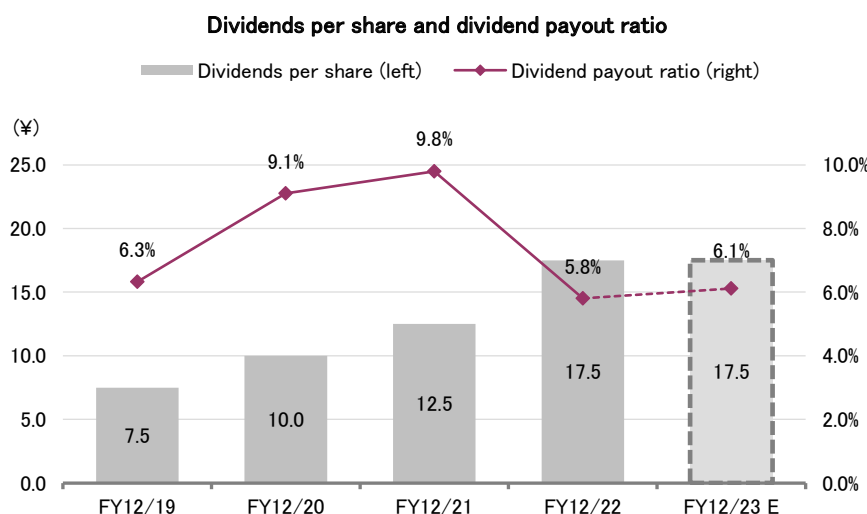
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Returns to shareholders and ESG initiatives

Aiming to continuously maintain dividend payments and improve the dividend level in accordance with results

1. Shareholder return policy

Making fair returns to shareholders is an important concern of management, and the Company's basic policy is to return profits to shareholders by paying dividends. It demonstrates a flexible policy of paying out dividends after considering a comprehensive range of factors, including current profits, the targets of its medium-term management plan, and its financial strength. In FY12/22, the Company increased the dividend for the fifth consecutive period, by ¥5.0 on the previous period to ¥17.5. It increased the ordinary dividend by ¥2.5 based on the steady growth of results, but it also paid an additional commemorative dividend of ¥2.5 following the listing of GRITEK. In addition, at the end of December 2022 it conducted a 1:2 share split. For FY12/23, it plans to pay only an ordinary dividend of ¥17.5 (dividend payout ratio of 6.1%). But at FISCO, when looking at the level of the dividend payout ratio, we think that it may increase the dividend if results are higher than the Company forecasts.



Note 1: FY12/22 includes a commemorative dividend of ¥2.5 following the listing of the Chinese subsidiary

Note 2: The Company conducted a 1:2 share split on December 31, 2022, so the dividends have been retroactively adjusted

Source: Prepared by FISCO from the Company's financial results and results briefing materials

2. ESG initiatives

Toward realizing a sustainable society, the Company is conducting the following initiatives from an ESG perspective.

Returns to shareholders and ESG initiatives

(1) Environment

The Company has formulated an environment policy, and based on ISO14001, it has established quality and environmental management committees to conduct environmental impact evaluations for environmental problems, such as those relating to environmental pollution and energy use, and after setting annual targets, it progresses environmental improvement activities. Specifically, as measures to prevent environmental pollution by plants, it defines management standard values for the chemical substances selected by the Company, conducts monthly monitoring and yearly management reviews, and works to reduce emissions. Additionally, to conserve the water environments in the areas around its plants, the Company sets its own drainage standards and regularly monitors drainage by plants, and works to prevent water pollution. It is also working to reduce the amount of industrial-waste emissions by recycling waste and to reduce industrial water usage and improve the reuse rate. In addition, as a measure to prevent global warming, it is working on reducing energy usage and reducing CO₂ emissions by installing solar power generation facilities (power generation capacity, 1.5 MW).

The wafer reclaim business can itself be positioned as an environmentally friendly business, because the use of reclaimed wafers contributes to reducing the consumption of energy that is necessary to manufacture new wafers. The CO₂ emitted in manufacturing reclaimed wafers is only around 1/9th of the emissions of manufacturing new wafers, so it contributes significantly to reducing CO₂ emissions.

Track record of environmental initiatives

	Chemical material usage (kg/k wafers*1)	Industrial-waste emissions (excluding sludge*2) (kg/k wafers)	Water usage (m ³ /k wafers)	Energy usage converted to crude oil (kl/k wafers)	CO ₂ emissions (t/k wafers)
FY2017	116.104	31.228	165.620	0.969	2.218
FY2018	111.324	28.766	158.698	0.906	1.995
FY 2019	117.133	32.075	153.998	0.899	1.981
FY 2020	124.921	31.855	136.524	0.844	1.846
FY 2021	119.098	29.463	123.995	0.795	1.739

*1 Calculated by converting the number of reclaimed wafers manufactured at the Sanbongi plant to 8-inch wafers

*2 Sludge is disposed of at a facility shared with other companies, so it is difficult to ascertain sludge for the Company alone and it is excluded from industrial-waste emissions.

Source: Prepared by FISCO from the Company's website

(2) Society

To provide high quality products and services to customers, the Company has constructed a quality assurance system that is based on the quality policy formulated in-house. It conducts quality control and is continuously working to improve quality through a quality management system based on ISO9001.

The Company's code of conduct for employees is "Aim to create a free and open corporate culture in which diversity is respected and work environments that are easy to work in," and it is working to recruit and develop diverse human resources and to create environments that are easy to work in. Specifically, it has formulated an action plan toward a work-life balance for up to 2025, and its aims are to reduce work hours outside of the prescribed work hours, improve the rate of employees taking paid leave, and increase their usage of the childcare and nursing care leave systems. It is also creating work environments in which women can be active and is aiming to increase the percentage of employees who are women (currently above 40%, excluding night-shift workers).

The Company is working to disclose information appropriately to shareholders and investors. For local communities, employees actively participate in local volunteer activities, while it also actively accepts members of local communities, such as through work experience, plant tours, and internships, and it is contributing to developing the next generation.

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Returns to shareholders and ESG initiatives

(3) Corporate governance.

In accordance with its corporate philosophy and code of conduct, the Company's management targets are to fulfill its social responsibilities in relation to its various stakeholders and to maximize enterprise value. To achieve these targets, it has positioned conducting management with enhanced corporate government as an important issue and is working to strengthen it. As a specific measure for this, following a resolution at the general meeting of shareholders in March 2022, it transitioned from being a company that establishes an auditing committee to a company that establishes auditing and other committees. It will strengthen the supervisory function over the board of directors by appointing to the board audit committee members who will be responsible for auditing and supervising the directors' execution of duties. Also, by separating business execution from supervision, it is aiming to speed up decision-making and further improve enterprise value.

Other than these initiatives, as an organization that conducts risk management, the Company has established a risk management committee that regularly evaluates business activities and other aspects. If there are risks, measures are taken to counter them. In addition, it has formulated a basic policy for compliance and once a year conducts compliance education and training for all employees, while it has also built an information security management system and is working to ensure compliance with information security-related laws and norms.

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