COMPANY RESEARCH AND ANALYSIS REPORT

RS Technologies

3445

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Index

Summary

FY12/21 results forecasts likely to exceed upwardly revised forecasts as wafer reclaim and prime wafer businesses continue to thrive

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. The Company entered integrated production and sales of prime wafers in China in 2018 and plans to begin 12-inch reclaimed wafer business at affiliate companies in 2022. It is also putting efforts into the cultivation of businesses such as semiconductor-related equipment and materials.

1. Cumulative total of sales and profits exceeded initial targets in 1H FY12/21

The Company reported consolidated results for 1H FY12/21 (Jan-Jun 2021) with ¥15,559mn in net sales (up 23.0% YoY), ¥2,464mn in operating income (down 4.5%), and ¥3,662mn in ordinary income (up 26.4%), exceeding initial targets (¥13,100mn in net sales, ¥2,200mn in operating income, and ¥2,200mn in ordinary income). The main factor behind this was upbeat sales, mainly in prime silicon wafer production and sales business (hereafter, prime wafer business) and semiconductor-related equipment and materials, etc. business, amid robust semiconductor demand. Operating income weakened due to ramp-up costs for the new plant that started operations at the Chinese subsidiary and higher R&D expenses. Nevertheless, subsidy income from local governments*1 covers these costs, and ordinary income posted a double-digit increase. Due to the recording of ¥1,372mn in share-based payment expenses*2 under extraordinary losses, net income attributable to owners of the parent dropped 62.6% to ¥630mn.

*1 The Company posted ¥1,102mn in subsidy income (¥35mn in the previous year) under non-operating income in 1H FY12/21.
*2 The Company recorded the difference from fair value as share-based payment expenses, accompanied by the transfer of some shares to an employee stockholding association as part of IPO preparations for subsidiary shares. It did not incur any cash outflow.

2. Raised the FY12/21 forecast though still has further room for upside

The Company raised the FY12/21 forecast to ¥31,600mn in net sales (up 23.6% YoY), ¥6,100mn in operating income (up 34.7%), and ¥7,300mn in ordinary income (up 39.0%), compared to initial targets of ¥29,200mn in net sales, ¥5,900mn in operating income, and ¥5,900mn in ordinary income. However, these revisions only factor in the upside amount through 1H and largely retain the period-start plan for 2H. FISCO sees room in the plan for further upside because semiconductor demand is still vibrant and the Company continues to operate at a full-capacity level in 2H and wafer reclaim business should realize full contributions due to reinforcement of output capacity in 2H. Additionally, the new 8-inch prime wafer plant in China should reach full operation within the year compared to the 60-70% level in 2Q and therefore drive even higher sales during 2H.

Summary

3. Targeting medium- to long-term growth by incorporating growth from the Chinese semiconductor market

The Company's goals in FY12/24, the final fiscal year of the medium-term management plan, are ¥37,100mn in net sales and ¥7,900mn in operating income. While the plan assumes a roughly 5% annual growth rate in the semiconductor market, demand has recently been rising at a pace faster than previous assumptions, and the Company lifted its planned FY12/23 output capacity for 12-inch reclaimed wafers by 4% compared to the initial plan. Meanwhile, in China, 8-inch prime wafers are mainly sold as low-priced monitor wafers now because the business is in the process of plant certification, although sales are likely to expand from FY12/22 onward as it fully ramps up the business for prime wafers. Additionally, the domestic subsidiary handling semiconductor-related equipment and materials business launched a new plant in May 2021, so this business is likely to grow as well. FISCO believes the Company is sufficiently capable of attaining the income goals in the medium-term management plan based on these trends.

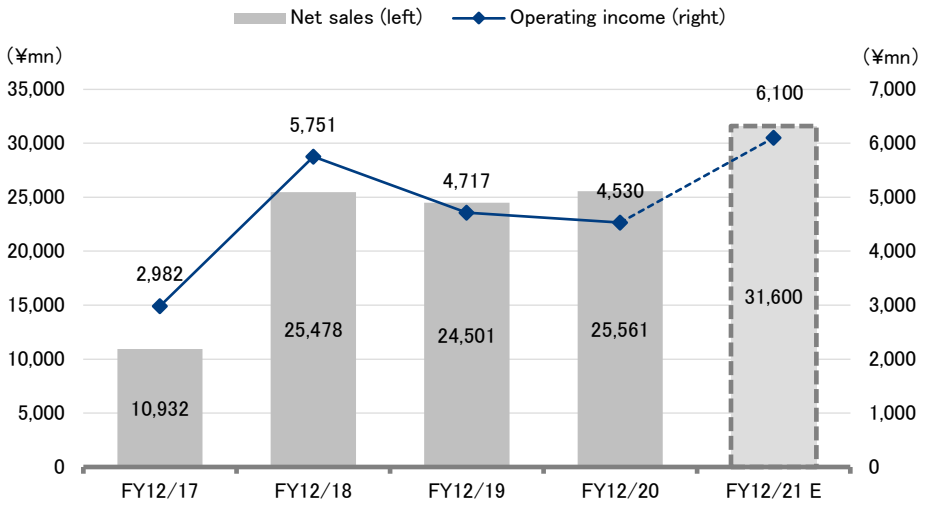
Regarding 12-inch prime wafers in development at Chinese equity-method affiliate Shandong GRINM RS Semiconductor Materials Co., Ltd.* (hereafter, SGRS), output has reached the quality level needed in monitor wafers and the Company intends to begin consideration of a mass-production plant in 2H FY12/22. It plans to address robust demand in China along with the scheduled start of mass production of 12-inch reclaimed wafers in 1Q FY12/22. It expects to acquire SGRS as a consolidated subsidiary once the business demonstrates profitability. The Chinese government is supporting the semiconductor industry as a national policy and it is projected to grow while leveraging this tailwind.

* Consolidated subsidiary GRINM Semiconductor Materials Co., Ltd., (hereinafter, GRITEK) owns 19.99% of its shares.

Key Points

- Net sales increased substantially with a 23.0% YoY gain in 1H FY12/21 amid robust semiconductor demand
- Despite upward revision of the FY12/21 forecast, results should exceed the forecast due to contributions from capacity reinforcement in wafer reclaim business and a rise in the operating rate in prime wafer business
- Smooth start in the medium-term management plan with capacity additions ahead of schedule at the Taiwanese plant and steady progress in developing 12-inch prime wafers

Results trends



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

Company overview

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

1. History

RS Technologies Co., Ltd. was established in December 2010 in order to take over the silicon wafer reclaim 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 reclaim processing 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 a subsidiary, RSTEC Semiconductor Taiwan Co., Ltd. that was established in 2014.

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 Kuramoto, 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 ingot 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 Kuramoto. Although its investment ratio is below 50%, Fujian Kuramoto 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%).

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. Furthermore, in 2020, it established Shanghai Union Semiconductor Co., Ltd. and Beijing Gritek & IVT Valve Technology Co., Ltd., to expand sales of semiconductor-related materials and established SGRS, which handles 12-inch wafer reclaim business and prime wafer business, jointly with GRINM and a fund affiliated with the Dezhou government (The Company made SGRS into an equity-method affiliate, with a 19.99% investment ratio from the time of its establishment, and currently owns shares through GRITEK). Through these businesses, the Company is actively developing operations in China.

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

2. Reclaimed wafers and prime wafers

To appreciate the strengths and growth potential of the Company's mainstay reclaimed silicon wafer 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.

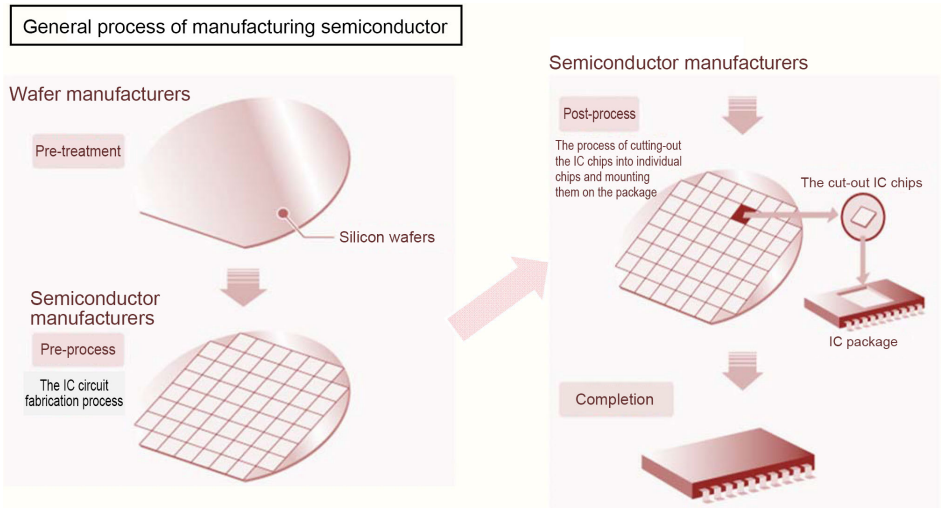
(1) Silicon wafers

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 μm ± 25 μm, 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

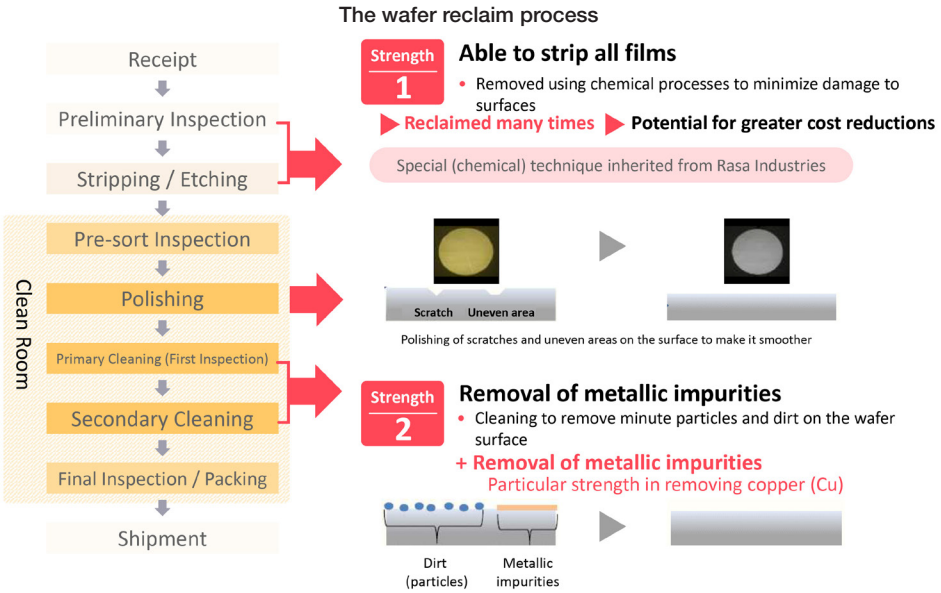
Currently, silicon wafers are mass produced in various sizes, ranging from 5 inches (125 mm) to 6 inches (150 mm), 8 inches (200 mm), and 12 inches (300 mm) in diameter. For state-of-the-art semiconductors that require high integration (miniaturization), 12-inch wafers are mass produced. The reason for this is that manufacturing a larger amount of semiconductor chips from a single silicon wafer makes it possible to keep manufacturing costs per wafer low amid increases in capital investment for semiconductors along with miniaturization. Alongside this trend toward a large diameter for the wafer size, wafer manufacturing technologies are also becoming more complex, which is raising the barrier to entry.

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 made using reclaimed wafers. Conversely, the wafers that are actually processed for the semiconductor chips 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

Currently, the amount of monitor wafers used is estimated to be about 20% of the total amount of wafers deployed on the semiconductor manufacturing line. Although it is the standard to use a new wafer for the monitor wafer, semiconductor manufacturers recycle used monitor wafers through a reclaiming process business such as the Company and reuse them in order to reduce the costs of manufacturing semiconductors as much as possible. As the price of a reclaimed wafer is approximately 25% of the price of a new wafer, if the number of wafers introduced remains the same, it is possible to significantly reduce wafer introduction costs simply by using reclaimed wafers for the monitor wafers.

In the wafer reclaim 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. One of the Company’s strengths is its technological capabilities, as in the film removal process, it is able to 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 to 20 or 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. For example, if the wafer thickness is reduced by 10 μm in a single polishing, the number of times the wafer can be reclaimed is only 14 or 15, but if the polishing can be kept down to a reduction of 5 μm, this number increases to as high as 30. Another of the Company’s strengths 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. Although there is currently not a large demand to introduce processes that require the degree of cleanliness of reclaimed wafers that use copper (Cu), demand may rise depending on environmental changes in the future, such as tightening conditions for supply and demand of wafers and increased costs.



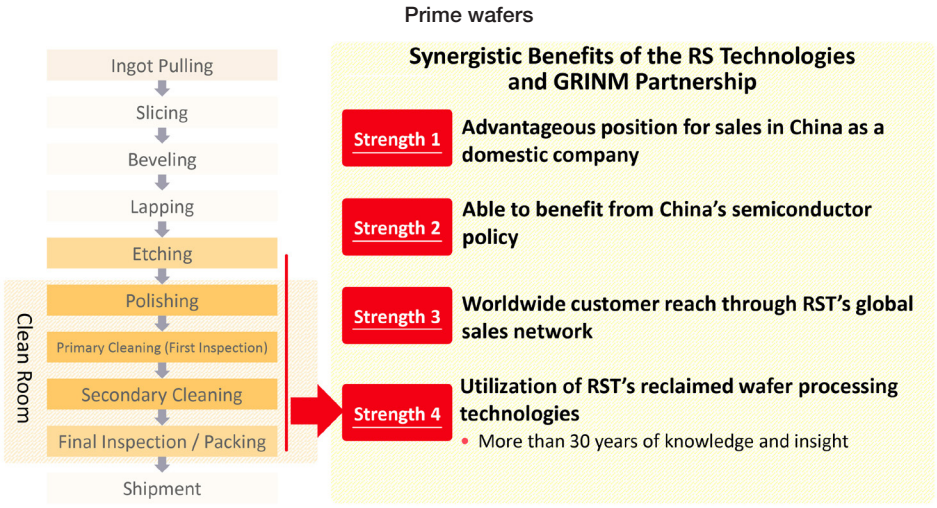
Source: The Company's results briefing materials

(3) Prime wafers

Prime wafer is another way of saying a new wafer. 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 (manufacturers that handle both front-end and back-end processes are called integrated manufacturers). 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 that can be produced from one silicon crystal ingot (because there is a large difference in price between new prime wafers and new monitor wafers).

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 top-class technology capabilities cultivated over many years in wafer reclaim 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.

Company overview

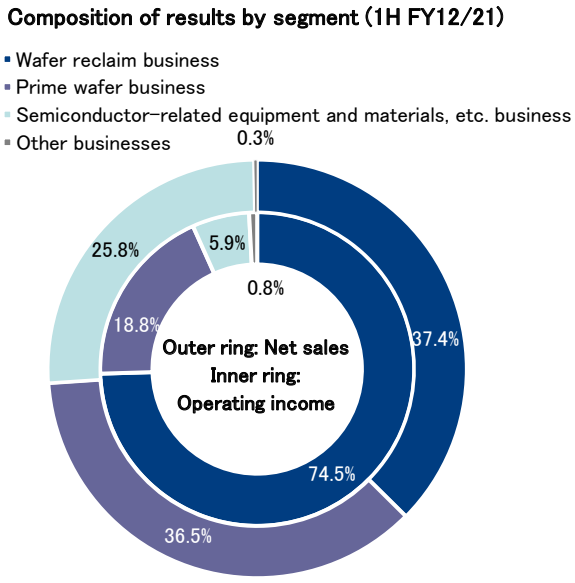


Source: The Company's results briefing materials

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 (prime silicon wafer manufacturing and sales 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 1H FY12/21, the wafer reclaim business provided 37.5% of net sales and 75.2% of operating income, and the prime wafer business provided 36.6% of net sales and 18.9% of operating income. These two businesses are the Company's core earnings drivers.

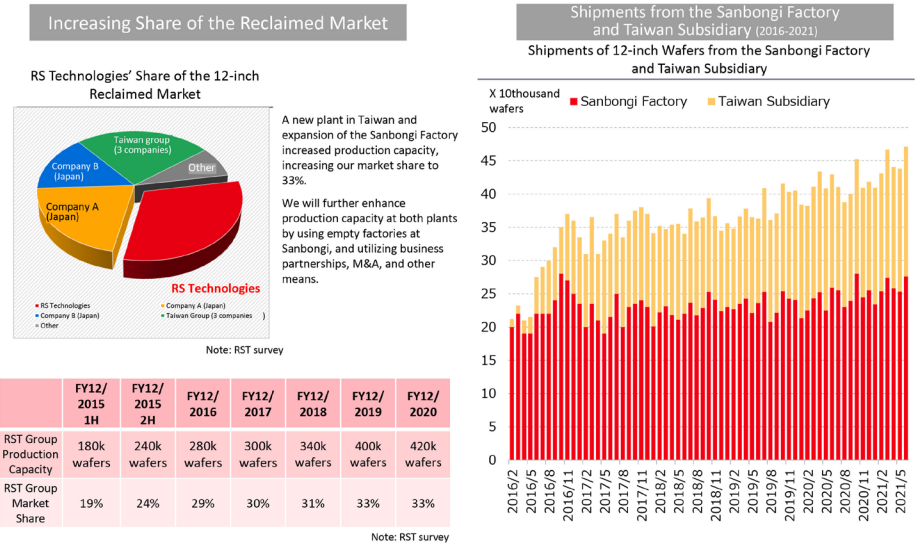


Source: Prepared by FISCO from the Company's quarterly financial results

(1) Wafer reclaim business

The wafer reclaim business is conducted by the Company and its Taiwanese subsidiary. At the end of 2020, the monthly production capacity for mainstay 12-inch wafers by the Company was 260,000 wafers (it has a production capacity of 130,000 wafers for 8-inches) in Japan, while its Taiwanese subsidiary has a capacity for 160,000 wafers, for a total 420,000 wafers (recently raised to 460,000 wafers). On a volume basis, it has the top share worldwide, at around 33% (the Company's estimate). 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 makes up roughly 90% of the global market share.

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



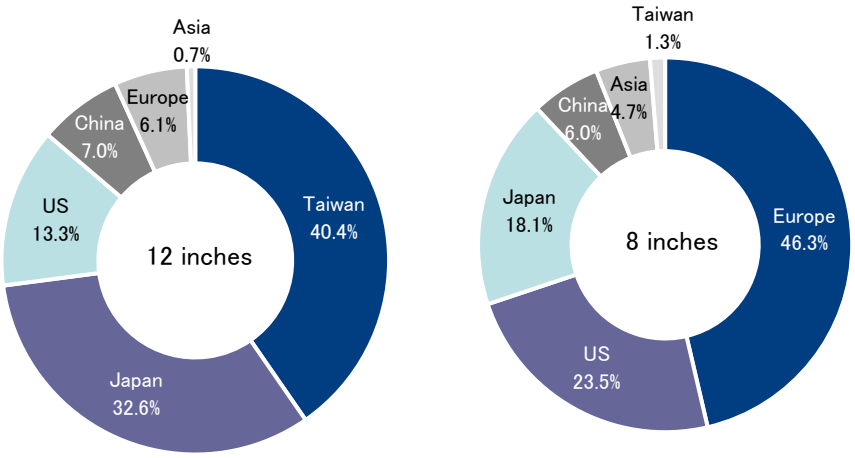
	FY12/2015 1H	FY12/2015 2H	FY12/2016	FY12/2017	FY12/2018	FY12/2019	FY12/2020
RST Group Production Capacity	180k wafers	240k wafers	280k wafers	300k wafers	340k wafers	400k wafers	420k wafers
RST Group Market Share	19%	24%	29%	30%	31%	33%	33%

Note: RST survey

Source: The Company's results briefing materials

Furthermore, the breakdown of the number of wafers shipped by region (FY12/20) are 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. Its main customers include major semiconductor manufacturers, such as TSMC <TSM> in Taiwan, Sony Semiconductor Solutions Corporation and Kioxia Corporation in Japan, Intel <INTC> and Micron Technology <MU> in the US, and STMicroelectronics <STM> and Infineon Technologies in Europe. In 12-inch reclaimed wafers, the Company is currently shipping the portion sold in China, which is 7.0% of the business, from Japan. It plans to steadily shift to SGRS with the scheduled launch of mass production in 2022 and utilize the domestic plant to cover demand in other regions.

Breakdown of shipment volume in the wafer reclaim business by region (FY12/20)



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

(2) Prime wafer business

Prime wafer business is covered by Chinese subsidiary GRITEK. Two-thirds of its sales consist of prime wafers, while consumable material and ingot sales make up the remaining one-third (FY2020). Prime wafer monthly capacity at the end of June 2021 totaled 50,000 5-inch wafers and 150,000 6-inch wafers at the Dezhou plant. For 8-inch wafers, a new investment was made in a production line with a monthly capacity of 50,000 wafers in addition to a production line with a monthly capacity of 80,000 wafers that was transferred to Shandong GRITEK's new plant in October 2020, resulting in a total capacity of 130,000 wafers. Chinese semiconductor manufacturers are the main customers for prime wafers, and customer volume has risen to 60-70 companies. These customers primarily manufacture analog semiconductors used in consumer electronics, automobiles, and other products. It sells consumable materials and ingots in overseas markets as well, and ships some consumable materials to DG Technologies, which makes semiconductor-related consumable materials in Japan.

(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 China, South Korea, Taiwan and other markets.

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). Customers include major domestic and overseas semiconductor device manufacturers and leading domestic and overseas semiconductor manufacturers. As production sites, it only had the Kamisu plant (Ibaraki) but opened a new site with the Kurihara plant (Miyagi) in May 2021 to address robust demand.

(4) Other businesses

The sales of other businesses are comprised of revenue from electricity sales from the solar power generation business started in 2013 (the power generation capacity is approximately 1.59 MW), and also 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

Net sales increased substantially by 23.0% YoY in 1H FY12/21 amid robust semiconductor demand

1. 1H FY12/21 results summary

In 1H FY12/21 consolidated results, the Company reported ¥15,559mn in net sales (up 23.0% YoY), ¥2,464mn in operating income (down 4.5%), ¥3,662mn in ordinary income (up 26.4%), and ¥630mn in net income attributable to owners of the parent (down 62.6%). Net sales and ordinary income set all-time highs as half-year values. Net sales, operating income, and ordinary income surpassed period-start targets against the backdrop of vibrant semiconductor demand.

1H FY12/21 results (consolidated)

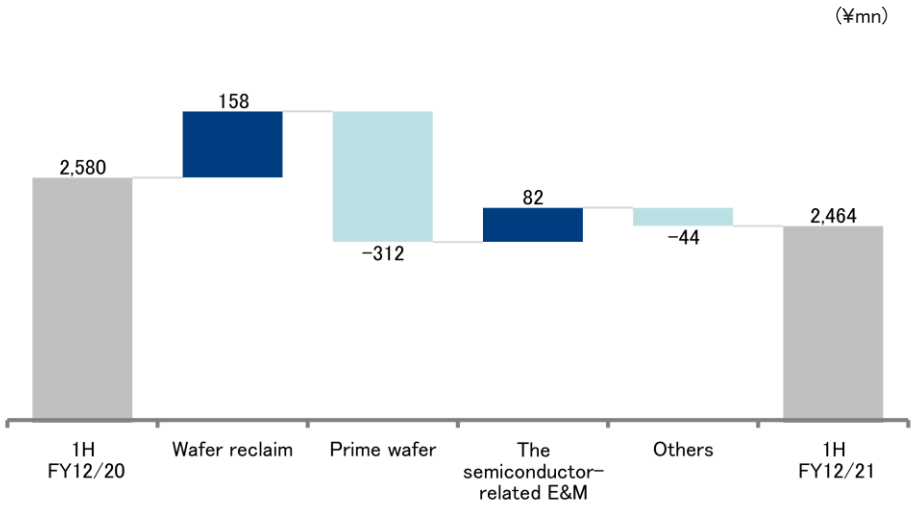
(¥mn)

	1H FY12/20		1H FY12/21				
	Results	% of sales	Initial plan	Results	% of sales	YoY	Achievement
Net sales	12,653	-	13,100	15,559	-	23.0%	18.8%
Cost of sales	8,491	67.1%	-	10,700	68.8%	26.0%	-
SG&A expenses	1,581	12.5%	-	2,395	15.4%	51.5%	-
Operating income	2,580	20.4%	2,200	2,464	15.8%	-4.5%	12.0%
Ordinary income	2,898	22.9%	2,200	3,662	23.5%	26.4%	66.5%
Extraordinary income	-	-	-	-1,372	-8.8%	-	-
Net income attributable to owners of the parent	1,686	13.3%	1,300	630	4.1%	-62.6%	-51.5%

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

The sales drivers were prime wafer business with a 25.2% YoY increase and semiconductor-related equipment and materials, etc. business with a 63.8% gain. Looking at factors behind the changes in operating income, despite increases of ¥158mn from wafer reclaim business and ¥82mn from semiconductor-related equipment and materials etc. business, profit in the prime wafer business decreased by ¥312mn, which dropped overall earnings. The setback was mainly caused by increases in new plant ramp-up costs at Shandong GRITEK and R&D expenses, including prototype costs related to certification of 8-inch wafers. Ordinary income, however, delivered a double-digit increase due to recording ¥1,102mn subsidy income (¥35mn in the previous fiscal year) under non-operating income with a scheme to cover these costs with subsidies from the local government. There was a large disparity between non-operating income and the initial plan because initial plan had placed subsidy income in operating income. This explains the relatively small upside in operating income versus the upside in net sales. For that reason, it is reasonable to assess real profit upside using ordinary income.

Factors affecting operating income in 1H FY 12/21



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

The Company recorded ¥1,372mn in share-based payment expenses under extraordinary losses. This stems from 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 preparations for the GRITEK IPO in February 2021 and the fair value acknowledged by the corporate auditor; the difference was recorded as share-based payment expenses in 1Q FY12/21. This case does not involve a cash outflow and also does not affect net assets (while it decreased retained earnings due to the recording of extraordinary losses, the increase in capital surplus offsets this amount).

Looking at results by major companies, the non-consolidated operations performed well at ¥6,681mn in net sales (up 27.9% YoY) and ¥1,320mn in operating income (up 34.4%). Key drivers were favorable contribution in the wafer reclaim business through robust customer demand and reinforcement of output capacity from 2Q and upbeat semiconductor-related equipment procurement sales. The Taiwanese subsidiary booked ¥2,708mn in net sales (up 14.0%) and ¥762mn in operating income (down 0.6%). Even with healthy 12-inch reclaimed wafer demand, primarily in business with TSMC, profit remained flat due to a rise in depreciation costs associated with investments in raising output. The Chinese subsidiary posted ¥5,841mn in net sales (up 22.7%) and ¥485mn in operating income (down 47.3%). Despite increased sales on operation of a new plant and progress in customer certifications of 8-inch prime wafers, increases in new plant ramp-up costs and R&D expenses resulted in profit decline (though it would have attained double-digit profit growth if subsidy income under non-operating income were included). In 2Q results, the Chinese subsidiary reported ¥3,637mn in net sales (up 45.2% YoY) and ¥723mn in operating income (up 21.5%), achieving sharply higher sales and profits after absorbing R&D expenses.

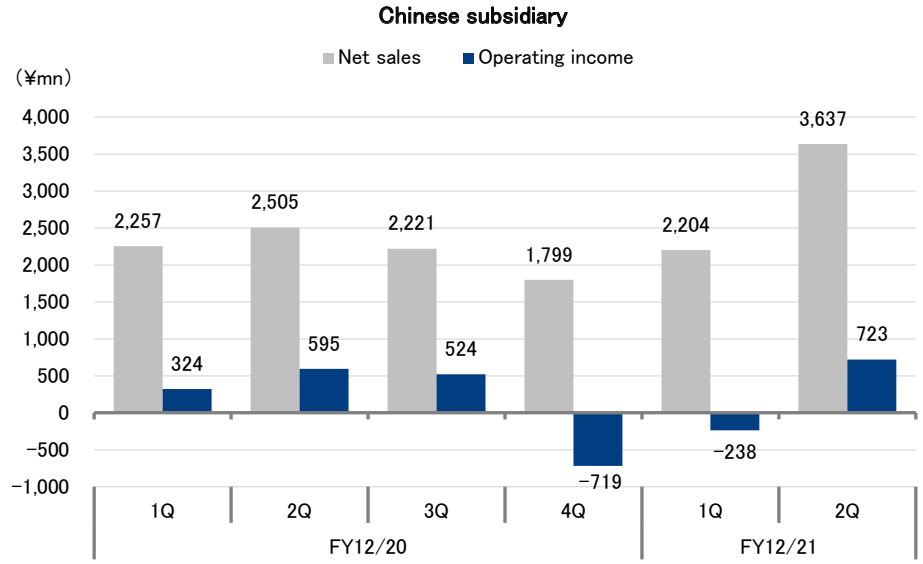
Business trends

Business performance trends by Group company in 1H FY12/21

(¥mn)

	The Company (non-consolidated)		Taiwanese subsidiary		Beijing subsidiary		Other subsidiaries	
	Results	YoY	Results	YoY	Results	YoY	Consolidated eliminations	YoY
Net sales	6,681	27.9%	2,708	14.0%	5,841	22.7%	329	-
Operating income	1,320	34.4%	762	-0.6%	485	-47.3%	-103	-
Operating income margin	19.8%	1.0pt	28.2%	-4.1pt	8.3%	-11.1pt	-	-

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



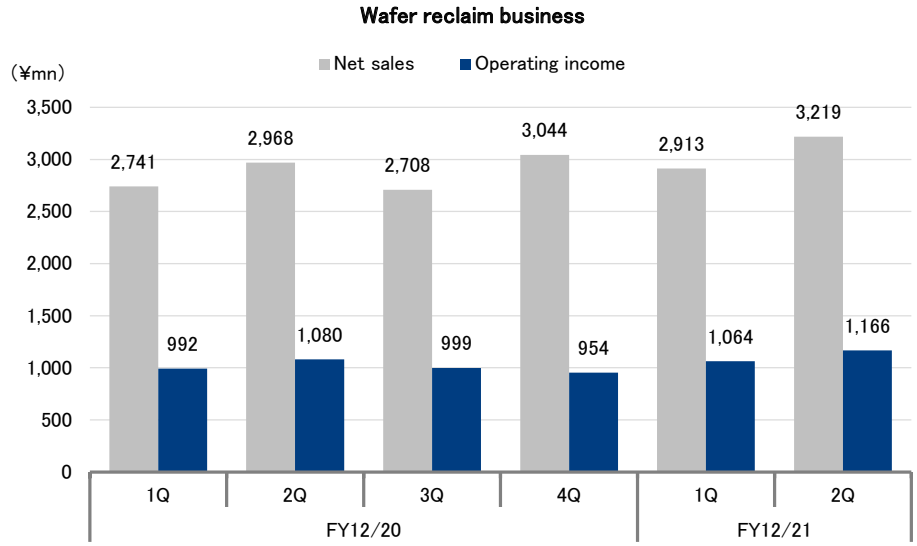
Source: Prepared by FISCO from the Company's results briefing materials

Healthy wafer reclaim business, advance in prime wafer business in 2Q, and sharp rise in semiconductor-related equipment and materials, etc. business sales

2. Developments by business segment

(1) Wafer reclaim business

Wafer reclaim business had ¥6,132mn in net sales (up 7.4% YoY; includes internal sales and transfer value (same below)) and ¥2,230mn in operating income (up 7.6%). Reinforcement of 12-inch reclaimed wafer output capacities in domestic and Taiwanese plants in 2Q to address vibrant demand from customers, amid ongoing growth in semiconductor demand led by memory and logic devices, contributed to higher sales and profits. Monthly output capacities rose by 20,000 to 280,000 wafers at the domestic plant and similarly rose by 20,000 to 180,000 wafers at the Taiwanese plant compared to end-FY12/20, and these plants continued running at full operation.



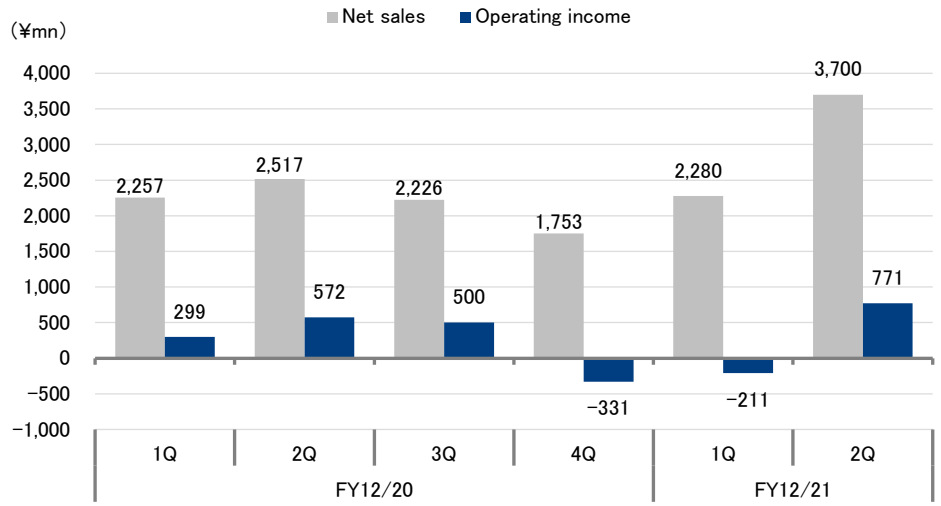
Source: Prepared by FISCO from the Company's results briefing materials

(2) Prime wafer business

Prime wafer business delivered ¥5,980mn in net sales (up 25.2% YoY) and ¥561mn in operating income (down 35.7%). As explained above, while sales rose with the launch of a new plant and customer certification progress, increases in new plant ramp-up costs and R&D expenses resulted in profit decline.

The new Dezhou plant has a monthly output capacity for 8-inch prime wafers of total 130,000 wafers with facilities transferred from the Beijing plant at 80,000 wafers and the newly built production line at 50,000 wafers. While increase in the plant operating rate was fairly modest from about 60% in December 2020 to 60-70% in 2Q FY12/21, quarterly sales rose substantially from ¥2,280mn in 1Q to ¥3,700mn in 2Q because the plant mainly sold low-priced monitor wafers initially after ramp-up due to lack of customer certifications for the facility and unit sales price increased in 2Q as the percentage of prime wafer sales moved to 40-50% due to the progress of customer certification. Higher sales of prime wafers lifted profitability as well.

Prime wafer business

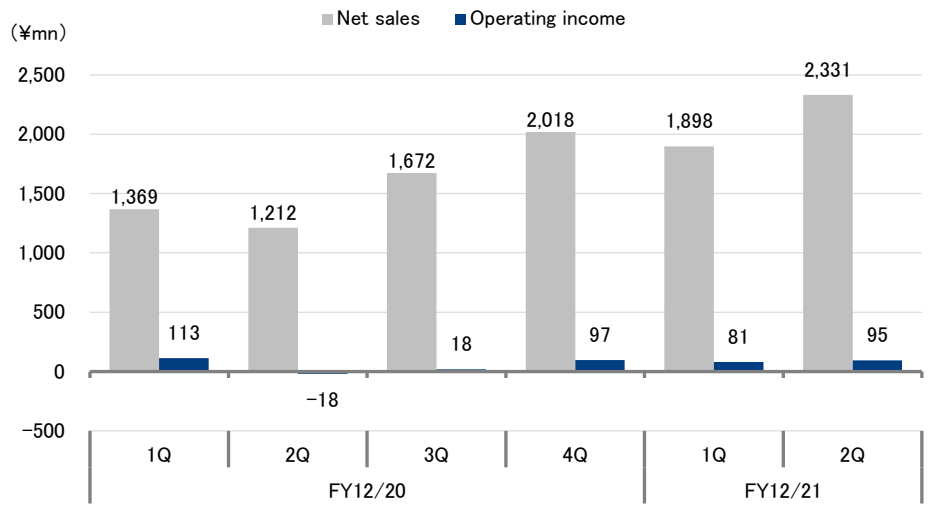


Source: Prepared by FISCO from the Company's results briefing materials

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

Semiconductor-related equipment and materials, etc. business recorded ¥4,229mn in net sales (up 63.8% YoY) and ¥176mn in operating income (up 87.2%). This segment enjoyed a large increase in semiconductor-related equipment procurement sales due to reinforced sales operations and also had upbeat sales of for consumable materials for dry etching equipment handled by DG Technologies to not only semiconductor equipment manufacturers but also major semiconductor manufacturers that continue to operate at full-capacity production. In consumable materials, since supply has been unable to keep pace with demand, the Company launched a new plant in Japan in May 2021 and intends to cover future demand increases with dual site operations. The new plant deploys automated equipment in the inspection process and other areas and offers higher productivity than the existing plant.

Semiconductor-related equipment and materials, etc. business



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

Has sustained sound financial conditions with positive net cash, despite borrowings to finance robust capital investments

3. Financial condition and management indicators

Looking at financial conditions at the end of 1H FY12/21, total assets increased by ¥12,264mn YoY to ¥71,014mn. The main factors behind the changes were increases of ¥5,382mn in cash and deposits and ¥1,096mn in notes and accounts receivable - trade in current assets, an increase of ¥2,750mn in property, plant and equipment accompanying reinforcement of capital investment at the Taiwanese subsidiary, and an increase of ¥2,273mn in investments and other assets from acquiring shares of equity-method affiliate SGRS.

Total liabilities were up ¥4,823mn from the previous fiscal year-end to ¥23,208mn. In current liabilities, there were increases of ¥277mn in notes and accounts payable - trade and ¥550mn in trade accounts payable. In non-current liabilities, there was an increase of ¥3,755mn in long-term borrowings. Interest-bearing debt rose by ¥5,489mn from the previous fiscal year-end to ¥8,625mn. Moreover, net assets increased ¥7,440mn from the previous fiscal year-end to ¥47,805mn. This increase mainly reflected an increase of ¥371mn in retained earnings due to the recording of net income attributable to owners of the parent, in addition to a foreign currency translation adjustment of ¥1,069mn as well as an increase in non-controlling interests of ¥6,456mn due to third-party allocation of shares by GRITEK.

Looking at the cash flow trends, cash flow from operating activities had ¥3,287mn in net inflow, while cash flow from investing activities totaled ¥7,504mn in net outflow primarily due to purchase of property, plant and equipment of ¥5,409mn and purchase of SGRS shares of ¥2,014mn. Cash flow from financing activities was ¥8,724mn in net inflow with ¥5,200mn in proceeds from long-term borrowings and ¥2,593mn in proceeds from share issuance to non-controlling shareholders. As a result, cash and cash equivalents increased by ¥5,400mn YoY to ¥23,310mn.

Looking at management indicators, while the equity ratio, which reflects soundness, declined from 40.5% at the end of FY12/20 to 34.8%, the interest-bearing debt ratio climbed from 13.2% to 34.9%, mainly due to increase in interest-bearing debt for use in capital investments. Nevertheless, since cash and deposits rose by roughly the same amount and net cash remains positive, we can determine that the Company is maintaining fiscal soundness.

Consolidated balance sheet and management indicators

(¥mn)

	FY12/18	FY12/19	FY12/20	1H FY12/20	Change
Current assets	26,074	32,760	32,626	39,887	7,261
(Cash and deposits)	14,879	22,156	19,082	24,465	5,382
Non-current assets	10,516	15,873	26,123	31,126	5,002
Total assets	36,591	48,634	58,750	71,014	12,264
Current liabilities	4,979	7,252	12,630	13,558	928
Non-current liabilities	2,474	5,400	5,754	9,649	3,895
Total liabilities	7,453	12,652	18,384	23,208	4,823
(Interest-bearing debt)	2,812	3,962	3,136	8,625	5,489
Net assets	29,137	35,981	40,365	47,805	7,440
[Stability]					
Equity ratio	49.6%	42.7%	40.5%	34.8%	-5.6pt
Interest-bearing debt ratio	15.5%	19.1%	13.2%	34.9%	21.7pt

	FY12/18	FY12/19	FY12/20	1H FY12/20
Cash flow from operating activities	2,669	9,015	6,377	3,287
Cash flow from investing activities	-22	-6,107	-9,188	-7,504
Cash flow from financing activities	9,550	4,206	-776	8,724
Cash and cash equivalents at end of period	14,652	21,363	17,910	23,310

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

Forecasts

Raised the FY12/21 forecast but likely to surpass updated targets considering the effect of capacity reinforcement in wafer reclaim business and increase in the operating rate for prime wafer business

1. FY12/21 forecasts

In FY12/21 consolidated results, the Company forecasts ¥31,600mn in net sales (up 23.6% YoY), ¥6,100mn in operating income (up 34.7%), ¥7,300mn in ordinary income (up 39.0%), and ¥3,100mn in net income attributable to owners of the parent (up 9.7%). While it made upward adjustments from the initial plan for net sales, operating income, and ordinary income values, FISCO thinks the adjustments are conservative and sees considerable room for upside. Updated values only factor in upside through 1H and largely remain unchanged from the initial plan for 2H. FISCO also expects further expansion in 2H sales, particularly in wafer reclaim and prime wafer businesses, as the semiconductor market is remaining vibrant in 2H. Subsidies related to the new Chinese plant should continue in 2H. The Company retained the initial plan's ¥104/USD as the assumed forex rate, and depreciation of the yen against the US dollar adds ¥30-40mn in full-year operating income.

FY12/21 consolidated results forecasts

(¥mn)

	FY12/20		FY12/21					1H progress rate
	Full-year results	% of sales	Initial plan	Revised plan	% of sales	YoY	Revised value	
Net sales	25,561	-	29,200	31,600	-	23.6%	2,400	49.2%
Operating income	4,530	17.7%	5,900	6,100	19.3%	34.7%	200	40.4%
Ordinary income	5,252	20.5%	5,900	7,300	23.1%	39.0%	1,400	50.2%
Net income attributable to owners of the parent	2,824	11.1%	3,100	3,100	9.8%	9.7%	-	20.3%
Earnings per share (EPS) (¥)	219.15		240.51	240.51				

Note: Forecasts assume forex rates of ¥108/USD for FY12/20 and ¥104/USD for FY12/21
Source: Prepared by FISCO from the Company's financial results

In conditions by business segment, while the initial plan for wafer reclaim business (estimated by FISCO from individual company plans) projected flat sales YoY and double-digit decline in operating income. However, as mentioned earlier, sales and profits increased in the single-digit range in 1H, and since vibrant customer demand has been continuing in 2H too, sales and profits are likely to sustain upward trends. The Company increased production capacities in Japan and Taiwan in 2Q, which should lead to full contributions in 2H. Furthermore, it modestly raised sales prices because of tight supply-demand conditions. These are positive factors in assessing 2H results. In sales prices, the Company lifted 8-inch reclaimed wafers by 5-10% and boosted the 12-inch reclaimed wafer prices by about 5% for some customers (besides major customers). While price increases only have a slight impact on profit due to offsetting impact of higher depreciation costs, they offer upside compared to the plan because price hikes were not anticipated in the initial forecast.

The initial forecast for prime wafer business (estimated by FISCO from individual company plans) indicated an 8% YoY rise in net sales and a double-digit increase in operating income, but the segment is on track to steep sales and profit gains. Monthly capacity in 8-inch prime wafers reached 130,000 wafers at the end of FY12/20 with the launch of a new plant. The outlook takes into account the plan to raise the operating rate from about 60-70% in 2Q to full capacity by the end of 2021 and forecasted expansion of sales volume. Additionally, steady progress in certification of the plant by customers should lift sales through change in sales composition (from monitor wafers to prime wafers) in 4Q. Upturn in the sales price on tight supply-demand conditions will have a positive impact as well.

Semiconductor-related equipment and materials, etc. business is expected to have higher sales and profits business (estimated by FISCO from individual company plans). As previously mentioned, this estimate reflects the upbeat semiconductor-related equipment procurement sales and the prospect of increased sales volume in semiconductor-related equipment consumable materials handled by DG Technologies, including the impact of launching a new plant. The new plant is still at the ramp-up stage and should gradually increase production volume. The Company started procuring silicon materials manufactured by the Chinese subsidiary as a cost-saving measure beginning in 2020. While growth should only modestly contribute to profits in FY12/21 due to higher depreciation costs associated with launching the new plant, sales expansion is likely to drive profit gains from FY12/22.

Smooth start in the medium-term management plan with capacity additions ahead of schedule at the Taiwanese plant and steady progress developing 12-inch prime wafers

2. Progress in the medium-term management plan

The four-year medium-term management plan announced in February 2021 sets goals for FY12/24, the final fiscal year of the plan, of ¥37,100mn in net sales and ¥7,900mn in operating income. This will result in average growth rates in the four fiscal years through FY12/24 of about 10% in net sales and roughly 15% in operating income. Since the Company assumes 5% annual growth in the overall semiconductor market, it is aiming for growth that exceeds the industry average.

The recent market forecast from World Semiconductor Trade Statistics (WSTS) as of August 2021 lifted semiconductor shipment growth rates from the originally projected 19.7% to 25.1% in 2021 and 8.8% to 10.1% in 2022. The reason behind the revision is that it appears increased semiconductor demand in various applications, such as PCs, smartphones, automobiles, and robots, and supply capacity might not keep up with demand. TSMC, the Company's largest customer, has started reviewing new plant construction in the US, Japan, and Taiwan. This trend is likely to continue as a tailwind for the Company's business for the time being.

The Company raised its FY12/21 forecast due to these conditions. FISCO, however, sees room for upside, including in FY12/22 results presented as the medium-term results goals, absent stalled semiconductor demand because of weaker economic activity. The Company is also focused on expanding its business in the Chinese market, particularly with government pursuit of cultivating the semiconductor industry as a national policy and the prospect of healthy expansion of semiconductor production in China over the medium to long term. Equity-method affiliate SGRS is currently developing 12-inch prime wafers and preparing mass production of reclaimed wafers. The Company has initially launched prime wafers business under an equity-method affiliate to alleviate management risk due to the need for large-scale funds to support capital investments and intends to raise its ownership stake to transform this business into a consolidated subsidiary once it demonstrates profitability. Sales scale should expand further if it adds SGRS as a consolidated subsidiary.

Forecasts

Medium-term management plan

(¥mn)

	FY12/20		FY12/21			FY12/22 Plan	FY12/23 Plan	FY12/24 Plan	CAGR (FY12/20 - FY12/24)
	Results	YoY	Initial plan	Revised plan	YoY				
Net sales	25,561	4.3%	29,200	31,600	23.6%	32,900	34,800	37,100	9.8%
Operating income	4,530	-4.0%	5,900	6,100	34.7%	6,500	7,000	7,900	14.9%
Operating income margin	17.7%	-1.6pt	20.2%	19.3%	1.6pt	19.8%	20.1%	21.3%	
Ordinary income	5,252	-3.0%	5,900	7,300	39.0%	6,600	7,100	8,000	11.1%
Ordinary income margin	20.5%	-1.6pt	20.2%	23.1%	2.6pt	20.1%	20.4%	21.6%	
Net income attributable to owners of the parent	2,824	-7.0%	3,100	3,100	9.7%	3,700	4,200	4,800	14.2%
Earnings per share (EPS) (¥)	219.15	-	240.51	240.51	-	286.19	324.87	371.27	

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

(1) Wafer reclaim business

In wafer reclaim business, the Company is increasing capacity in Japan and Taiwan and also beginning mass production at the Dezhou plant of Chinese affiliate SGRS starting from FY12/22 in order to respond to robust demand for 12-inch reclaimed wafers. It is the first company to mass produce 12-inch reclaimed wafers at three sites (Japan, Taiwan, and China). It also reviewed the investment plan in Taiwan at this time to address vibrant demand by raising target capacity for 2023 from the previous 200,000 wafers to 220,000 and investing a combined ¥1.1bn during 2022 and 2023 as additional investments to support the increase. As a result, monthly output capacity for 12-inch reclaimed wafers for the entire Group should expand by about 1.4-fold from 420,000 wafers at the end of FY12/20 to 570,000 at the end of FY12/23. The Company has a monthly output capacity for 8-inch reclaimed wafers of 130,000 wafers in Japan and plans to expand by about 1.3 times on a surface-area basis over four years. Based on sales of about ¥11.4bn in FY12/20, sales will rise to just under ¥15bn in FY12/24 for an average annual growth rate of 7%, assuming that prices and operating rates remain unchanged. These levels seem reasonable considering the risk of temporary adjustment in the semiconductor market from 2023 onward.

Plan to strengthen the production capacity for 12-inch reclaimed wafers

Plant	Monthly production capacity at period-end			
	2020	2021	2022	2023
Sanbongi plant	260,000 wafers	280,000 wafers	300,000 wafers	300,000 wafers
Tainan plant	160,000 wafers	180,000 wafers	190,000 wafers	220,000 wafers (200,000 wafers)
Dezhou plant	-	-	50,000 wafers	50,000 wafers
Total	420,000 wafers	460,000 wafers	540,000 wafers	570,000 wafers (550,000 wafers)

Note: Figures in parentheses are plan targets as of February 2021
Source: Prepared by FISCO from the Company's results briefing materials

Capital investment plans

(¥bn)

Plant	2020	2021	2022	2023
Sanbongi plant	0.2	0.9	0.5	Undecided
Tainan plant	0.2	0.8	0.7 (0.3)	1 (0.3)
Dezhou plant*	0.5	3	0.5	0.1
Total	0.9	4.7	1.7 (1.3)	1.1 (0.4)

* The Dezhou plant's portion is from the newly established SGRS (an equity-method affiliate with an ownership ratio of 19.99%), and it will be responsible for about 10% of the capital investment amount.
Note: Figures in parentheses are plan targets as of February 2021
Source: Prepared by FISCO from the Company's results briefing materials

Looking at the capital investment plan, the peak should come in FY12/21 at ¥4.7bn when it carries out capital investment aimed at starting mass production at the Dezhou plant. Since the Dezhou plant is under an affiliate company, the Company incurs about 20% of capital investment value. The Dezhou plant will begin operating in 1Q FY12/22 at a monthly capacity of 50,000 wafers. China has the largest number of new construction plans for 12-inch wafer semiconductor plants in the world, and reclaimed wafer demand might expand at a faster pace than expected. Given this environment, the Company is anticipating an increase in monthly output to 100,000 wafers at some point from 2024. Once mass production begins in China in FY12/22, the Company intends to switch the portion currently exported from Japan to China to shipments from the Dezhou plant and ship output from excess capacity at the domestic plant to customers in Japan, Asia, the US, and Europe.

As a new competitor in 12-inch reclaimed waters in China, the Chinese subsidiary of Ferrotec Holdings Corporation <6890> completed a plan with monthly output capacity of 120,000 wafers and appears to have started mass production since April 2021. Nevertheless, FISCO believes the Company is capable of sustaining its high share in China going forward because of technology and quality advantages. Specifically, these advantages include precise film separation technology and polishing technology capabilities that are capable of restricting wafer surface damage to a minimum and increasing reclaimed usage to a rate that is roughly twice the industry average. The Company claims that it has cultivated these techniques through its involvement in the wafer reclaim business for over 30 years and that they cannot be matched by competitors.

(2) Prime wafer business

In the prime wafer business, the new plant at Shandong GRITEK (Dezhou plant) completed in October 2020 has initiated mass production of 8-inch wafers with a monthly output capacity of 130,000 wafers, and the Company intends to maintain capacity at 130,000 wafers through 2023. Meanwhile, affiliate SGRS is conducting R&D aimed at achieving mass production of 12-inch prime wafers and has already attained the quality standard for monitor wafers. In FY12/21, it allocated ¥4bn in capital investments to build a test line with a monthly output capacity of 10,000 wafers and has begun selling them to customers in the wafer reclaim business as monitor wafers.

Selling these wafers as prime wafers requires further enhancements in quality with the ingot pulling process as a key step. It is difficult to pull large-diameter ingots at uniform purity and quality (oxygen concentration, resistance value, etc.) while attaining high yield. Chinese manufacturers that started development ahead of SGRS still have not seems to establish technology to support mass production. SGRS is currently in the process of recruiting engineers who worked at major silicon wafer companies to communicate knowhow to local staff. Polishing and cleaning processes, which are the back-end of production, are not an issue thanks to the use of reclaimed wafer technology. This means that SGRS might enter the stage of building a mass production line by the latter half of FY12/22 if development activities proceed smoothly. Since construction of facilities with a monthly output capacity of 300,000 wafers, the target level, involves massive funding on the scale of ¥100bn, the Company is likely to consider various approaches, such as incremental implementation of capital investments or an M&A deal with a Chinese competitor. It is thought that these investment funds will be covered in partnership with joint-venture partner GRINM and an investment fund affiliated with the Dezhou government.

Prime wafers have grades determined by their quality level. While semiconductors manufactured at cutting-edge processes of less than 10nm utilize the highest-grade wafers, Chinese semiconductor manufactures extensively use products at a grade that is slightly lower than the average level. SGRS aims to expand market share by selling these volume-grade products at cheaper prices than major manufacturers. It has currently reached quality that supports a 45nm manufacturing process and intends to move forward with mass production after boosting quality further and enhancing yield.

Forecasts

Investment plan for prime wafers in China

Shandong GRITEK (consolidated subsidiary) 8 inches	2020	2021
Monthly capacity	80,000 wafers	130,000 wafers
Capital investment value (¥bn)	¥14bn	-*

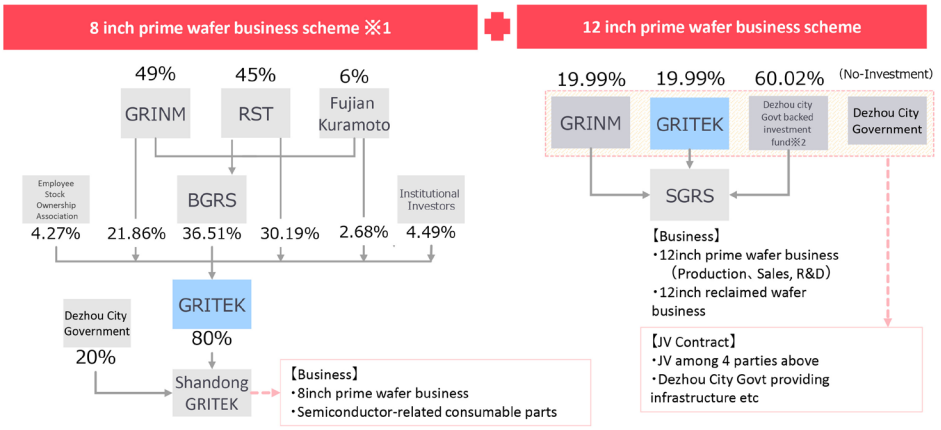
* Already conducted in 2020

SGRS (equity-method affiliate) 12 inches (test line)	2020	2021	202X
Monthly capacity	-	10,000 wafers	300,000 wafers
Capital investment value (¥bn)	¥0.5bn	¥4bn	Undecided

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

In September 2020, the Company announced that its subsidiary GRITEK had started preparing to list shares on the Shanghai Stock Exchange STAR Market for newcomer companies (referred to as China's NASDAQ). Following submission of the IPO application in 2021, it is likely to list shares during 1H FY12/22 if the review proceeds smoothly. The listing aims to achieve further growth through diversification of fund raising, enhancement of brand power, hiring talented personnel, and strengthening the business foundation. At the same time, it targets improvement of Group corporate value. The Company plans to retain a majority of control rights after the listing and maintain this company as a consolidated subsidiary.

Investment scheme for the Chinese business (after implementing content disclosed in May 2021)



※1 The business scheme above is after execution of GRITEK's third party allocation and share transfer of equity method affiliate to GRITEK
※2 Dezhou Huida Semiconductor Equity Investment Fund Partnership

Source: The Company's results briefing materials

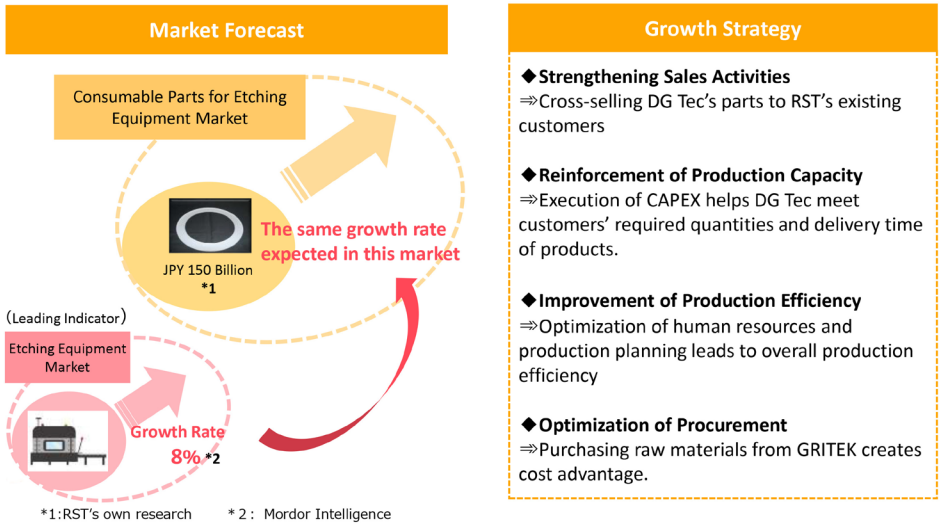
(3) Pursuit of growth in semiconductor-related consumable materials as a third major income source

To attain its goal of cultivating a third major income source besides existing wafer reclaim and prime wafer businesses, the Company has clarified a policy of focusing 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 semiconductor-related equipment and silicon electrodes.

The Company estimates that the market for semiconductor-related consumable materials is worth about ¥150bn annually and has set a sales goal to a 10% share (about ¥15bn) for the time being. It expects to expand sales in FY12/21 (compared to the FY12/20 level) and intends to address vibrant demand in Japan and Taiwan by raising the operation rate at a new plant with high productivity.

Despite the presence of competitors in Japan, Taiwan, Korea, the US, and other countries, the Company possesses strengths in quality and technology capabilities. Low production efficiency had been an issue previously due to small-lot manufacturing of a wide range of product types. However, the Company aims to improve production efficiency by installing automation equipment and optimizing personnel assignments. In materials costs, it has been acquiring silicon from group company GRITEK since FY12/20 to reduce costs. The Company aims to expand its sales share by reinforcing competitiveness with these measures and implementing cross-selling efforts to customers in the wafer reclaim business. Its long-term goal is a global share of roughly 30% with ¥45bn in sales. Techno Quartz Inc. <5217>, a competitor in quartz glass, reported ¥12.7bn in sales with 19% operating income margin in FY3/21, and FISCO thinks DG Technologies is also capable of attaining an operating income margin between 15-19% if it expands sales.

Growth strategy of DG Technologies



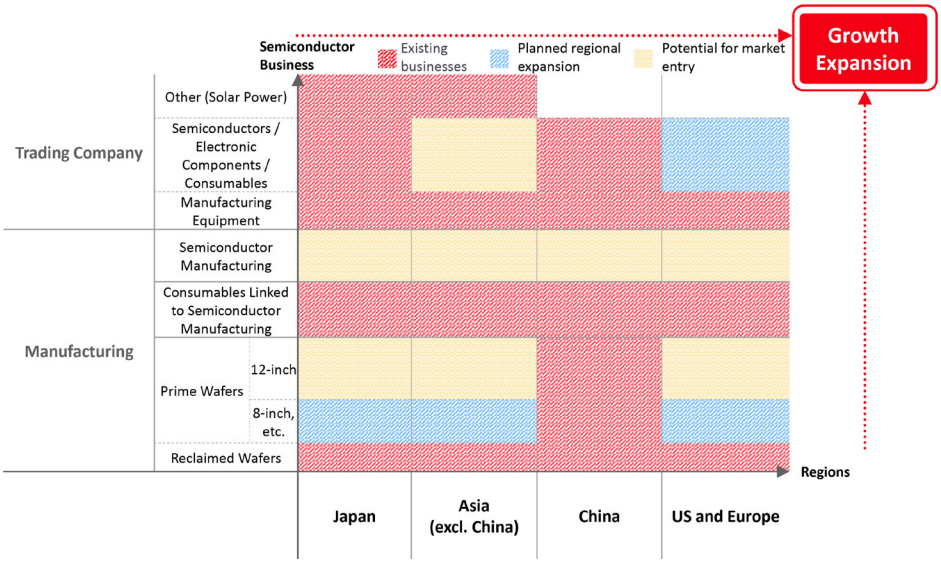
Source: The Company's results briefing materials

(4) Development of business areas and sales regions in the future

As its long-term strategy, the Company's policy is to expand its business areas and sales regions. The new developments it is currently planning include sales of prime wafers produced in China to regions other than China. The Company wants to export products to the Japanese, US, and European markets at some point, though this is a long-term strategy because operations are busy handling demand in China for the time being. Also, as a trading-company function, it conducts sales of semiconductors, electronic parts, and consumable materials in Japan, China, and other parts of Asia, and plans to sell these products in the European and US markets as well in the future. The Company intends to constructively review M&A deals in Japan and abroad if it finds opportunities with synergies in semiconductor wafer-related areas.

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 rarely affected by downturns. FISCO believes the Company's strategy of accelerating earnings at a pace that surpasses the speed of growth in the semiconductor market by making the wafer reclaim business, in which it has a high market share, into a stable earnings base, expanding the prime wafer business on the tailwind from growth in China's semiconductor industry, and cultivating semiconductor-related consumable materials as a third major income source is sufficiently feasible from a medium- to long-term perspective.

Regional initiatives targeted by the Company



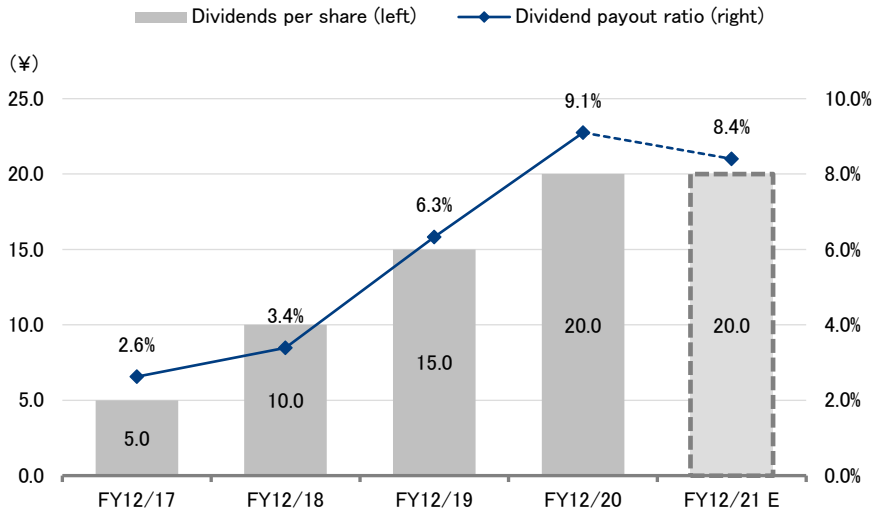
Source: The Company's results briefing materials

Shareholder return policy

Aiming to continuously maintain dividend payments and improve a dividend level that reflects results

Making fair returns to shareholders is an important concern of Company management, and the Company's basic policy is to return profits to shareholders by paying dividends. The Company 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. The Company plans to pay a dividend of ¥20.0 per share (an 8.4% dividend payout ratio), which is unchanged YoY, in FY12/21. However, dividend increases may be considered if earnings appear to be proceeding at a healthy pace, given the consecutive dividend hikes in the past three years and relatively low dividend payout of 8.4%.

Dividends per share and dividend payout ratio



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

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