

The background of the slide features a large, semi-transparent Ferro Tec logo on the left. To the right, there is a collection of various industrial components, including cylindrical parts, valves, and electrical connectors, arranged in a cluster. The overall color scheme is light blue and white.

Ferro Tec

THERMOELECTRIC MODULE
COMPUTER PERIPHERALS
VACUUM ELECTRONIC COMPONENTS
QUARTZ
CMS IC Contract Manufacturing Services

Ferrotec Holdings Corporation

Results for the fiscal year ended March 31, 2018

May 28, 2018

(JASDAQ 6890)

<http://www.ferrotec.co.jp/>

1. This fiscal year results cover twelve months period from April to March of Ferrotec, and twelve months period from Jan. to Dec. of consolidated subsidiaries and affiliated companies included in investment profit loss in equity method.
2. This presentation was prepared for the purpose of providing information regarding the company's results of operations for the fiscal year ended March 31, 2018 and is not a solicitation to purchase securities issued by the Company. Please ensure that the decision on whether to make an investment in our Company is made at your own risk.
3. These materials were prepared based on information available as of May 28, 2018. All opinions, forecasts and other forward-looking statements are based on management's judgments in accordance with materials available at that time and may be changed without prior notice.



FY March 2018 Financial Results

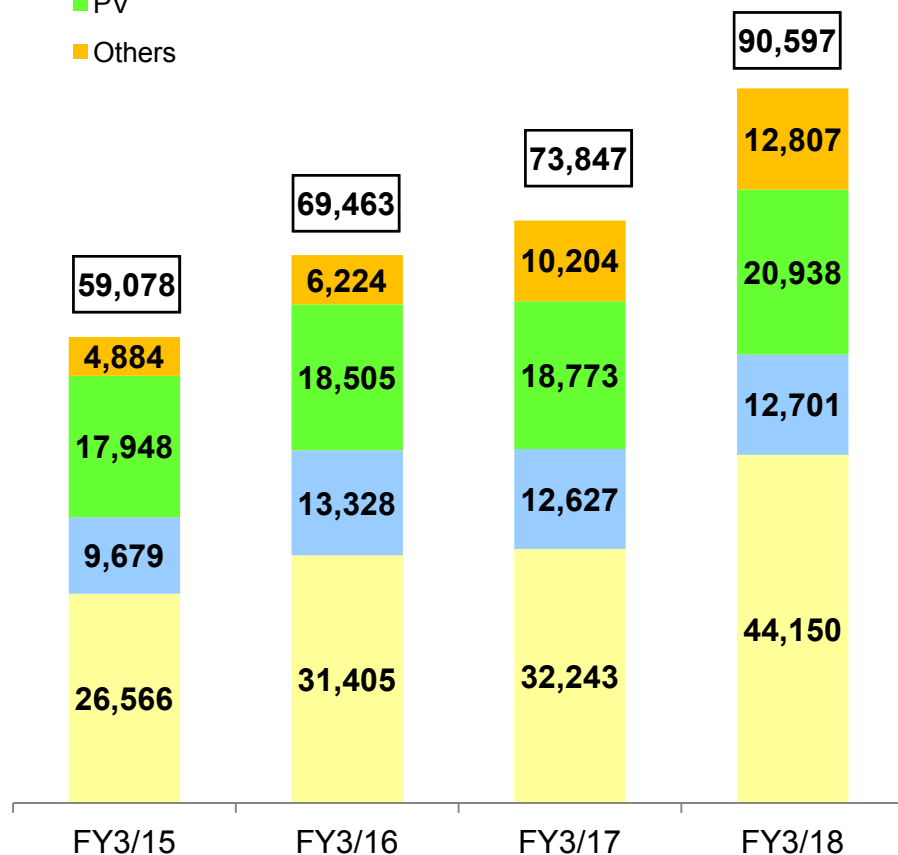
Sales and Operating income Trend



Sales Trend

(¥ in millions)

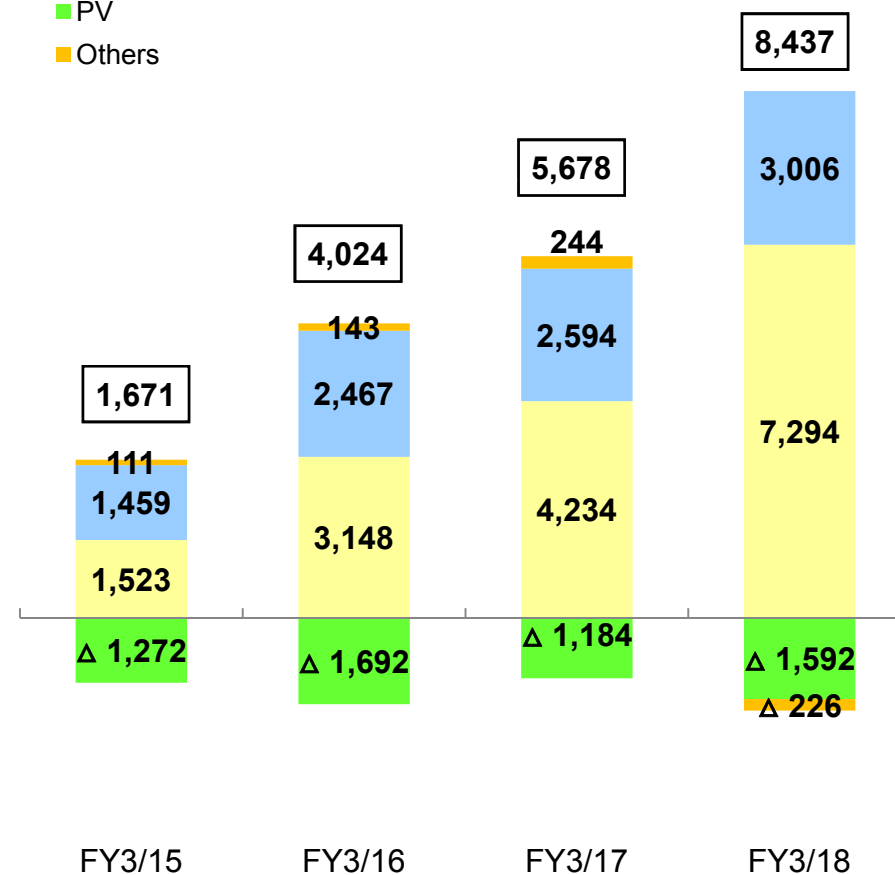
- Semiconductor and other equipment-related
- Electronic device
- PV
- Others



Operating income Trend

(¥ in millions)

- Semiconductor and other equipment-related
- Electronic device
- PV
- Others



Financial highlights



¥ in millions	FY3/17		FY3/18		YOY	
	Amount	Pct. of sales(%)	Amount	Pct. of sales(%)	Amount	Pct. Change(%)
Net sales	73,847	100.0	90,597	100.0	16,750	22.7
Cost of sales	54,139	73.3	65,682	72.5	11,543	21.3
Gross income	19,708	26.7	24,915	27.5	5,207	26.4
SG&A expenses	14,030	19.0	16,477	18.2	2,447	17.4
Operating income	5,678	7.7	8,437	9.3	2,759	48.6
Non-operating income	862	1.2	669	0.7	△ 193	△ 22.4
Non-operating expense	864	1.2	1,948	2.2	1,084	125.5
Ordinary income	5,675	7.7	7,157	7.9	1,482	26.1
Extraordinary income	170	0.2	122	0.1	△ 48	△ 28.2
Extraordinary loss	731	1.0	1,779	2.0	1,048	143.4
Net income attributable to owners of parent	3,256	4.4	2,678	3.0	△ 578	△ 17.8
Capital Investment	7,322	-	12,300	-	4,978	68.0
Depreciation	3,593	-	4,188	-	595	16.6

Note: Exchange rate FY3/17⇒FY3/18 : US\$ ¥ 109.44 → ¥112.04 RMB ¥ 16.41 → ¥ 16.63 (Avg. during period)

Capital investment is based on cash flow considering unprojected large-scale capital investment and accounts payable facilities at the end of previous fiscal year.

Financial highlights



¥ in millions	FY3/18	
	Amount	Pct. of sales(%)
Net sales	90,597	100.0
Cost of sales	65,682	72.5
Gross income	24,915	27.5
SG&A expenses	16,477	18.2
Operating income	8,437	9.3
Non-operating income	669	0.7
Non-operating expense	1,948	2.2
Ordinary income	7,157	7.9
Extraordinary income	122	0.1
Extraordinary loss	1,779	2.0
Income before income tax	5,501	6.1
Corporate tax, etc.	2,815	3.1
Net income attributable to owners of parent	2,678	3.0

Gross profit margin improved from 26.7% in the previous year to 27.5% as the impact of the disposal of the residual inventory assets in the photovoltaic-related business was absorbed mainly by increased sales in the semiconductor and other equipment-related segment.

SG&A increased by 2,447 million yen YoY associated with increased sales, but SG&A expenses to sales ratio improved to 18.2% from 19.0% in the previous year

Equity-accounted investment income :
¥328million
Exchange loss: ¥640million

A provision of 1,114 million yen was posted for litigation matters related to PV business. An appeal in relation to this case has been accepted, but the provision has been posted from a conservative perspective.

Segment Sales and Operating income



Net sales (¥ in millions)	FY3/17		FY3/18		YOY	
	Amount	Pct. Of Sales(%)	Amount	Pct. Of Sales(%)	Amount	Pct. change(%)
Semiconductor and other equipment-related	32,243	43.7	44,150	48.7	11,907	36.9
Electronic device	12,627	17.1	12,701	14.0	74	0.6
Photovoltaic-related	18,773	25.4	20,938	23.1	2,165	11.5
Others	10,204	13.8	12,807	14.1	2,603	25.5
Total	73,847	100.0	90,597	100.0	16,750	22.7

Operating income (¥ in millions)	FY3/17		FY3/18		YOY	
	Amount	Pct. Of Sales(%)	Amount	Pct. Of Sales(%)	Amount	Pct. change(%)
Semiconductor and other equipment-related	4,234	13.1	7,294	16.5	3,060	72.3
Electronic device	2,594	20.5	3,006	23.7	412	15.9
Photovoltaic-related	△1,184	-	△1,592	-	△408	-
Others	244	2.4	△226	-	△470	-
Corporate & elimination	△210	-	△44	-	166	-
Total	5,678	7.7	8,437	9.3	2,759	48.6

Consolidated Balance Sheet ~Assets~



(¥ in millions)	FY3/17	FY3/18	Difference
Current assets	51,245	67,240	15,995
Cash & deposits	14,778	23,648	8,870
Note & accounts receivable	17,656	20,700	3,044
Inventory	13,883	16,773	2,890
Fixed assets	40,855	51,217	10,362
Tangible fixed assets	34,294	43,541	9,247
Building	8,583	10,355	1,772
Equipment & machinery	8,454	12,564	4,110
Tools, furniture, and fixture	5,908	7,304	1,396
Land	1,280	1,589	309
Intangible fixed assets	2,060	2,922	862
Goodwill	769	378	△ 391
Investments & other assets	4,499	4,753	254
Total assets	92,100	118,457	26,357

[Main reason for increase in current assets]
 Increased due to an increase in cash and deposits due to the issuance of shares, an increase in notes and accounts receivable due to increased sales, and an increase in inventories due to solid orders received.

[Main reason for increase in tangible fixed assets]
 Increased due to equipment for 8-inch wafers, increased production facilities for ceramics and quartz, etc., (including construction in progress of 1,754 million yen).

[Intangible fixed assets]
 Amortization of goodwill: ¥392 million
 (of which, ¥185 million is temporarily amortized from Asahi Seisakusho Co., Ltd.)
 Acquisition of land-use rights by 8-inch wafer subsidiary established in Hangzhou City ("Other assets" in intangible fixed assets) ¥1,260 million

Consolidated Balance Sheet

~Liabilities and net worth~



(¥ in millions)	FY3/17	FY3/18	Difference
Current liabilities	32,108	43,481	11,373
Notes and accounts payable	13,926	18,419	4,493
Short-term debt	5,002	5,874	872
Current portion of long-term borrowings + Bonds	4,538	5,643	1,105
Fixed liabilities	20,290	23,163	2,873
Long-term debt+Bonds	12,625	13,896	1,271
Total liabilities	52,399	66,645	14,246
Net Assets	39,701	51,812	12,111
Shareholder's equity	33,208	43,855	10,647
Total accumulated other comprehensive income	6,015	7,449	1,434
Non-controlling interests	453	502	49
Total liabilities & shareholder's equity	92,100	118,457	26,357

[Main reason for increase in Current liabilities]

Increased due to increase in accounts payable due to strong sales of products in the semiconductor and other equipment-related segment and increase in equipment payable

[Interest-being debt]

Short-term debt +Current portion of long-term borrowings+Bonds **¥11,518 million (9,541)**

Long-term debt + bond **¥13,896 million (12,625)**

Total ¥25,414 million (22,166)

[Net interest-being debt ¥1,766 million (7,388)]

*Parentheses represent the figures as of end-FY3/17

[Net assets]

Breakdown:

Issuance of shares : **¥8,784million**

Net income : **¥2,678million**

Dividends : **△ ¥ 812million**

Foreign currency translation adjustments :
: **¥1,375million**

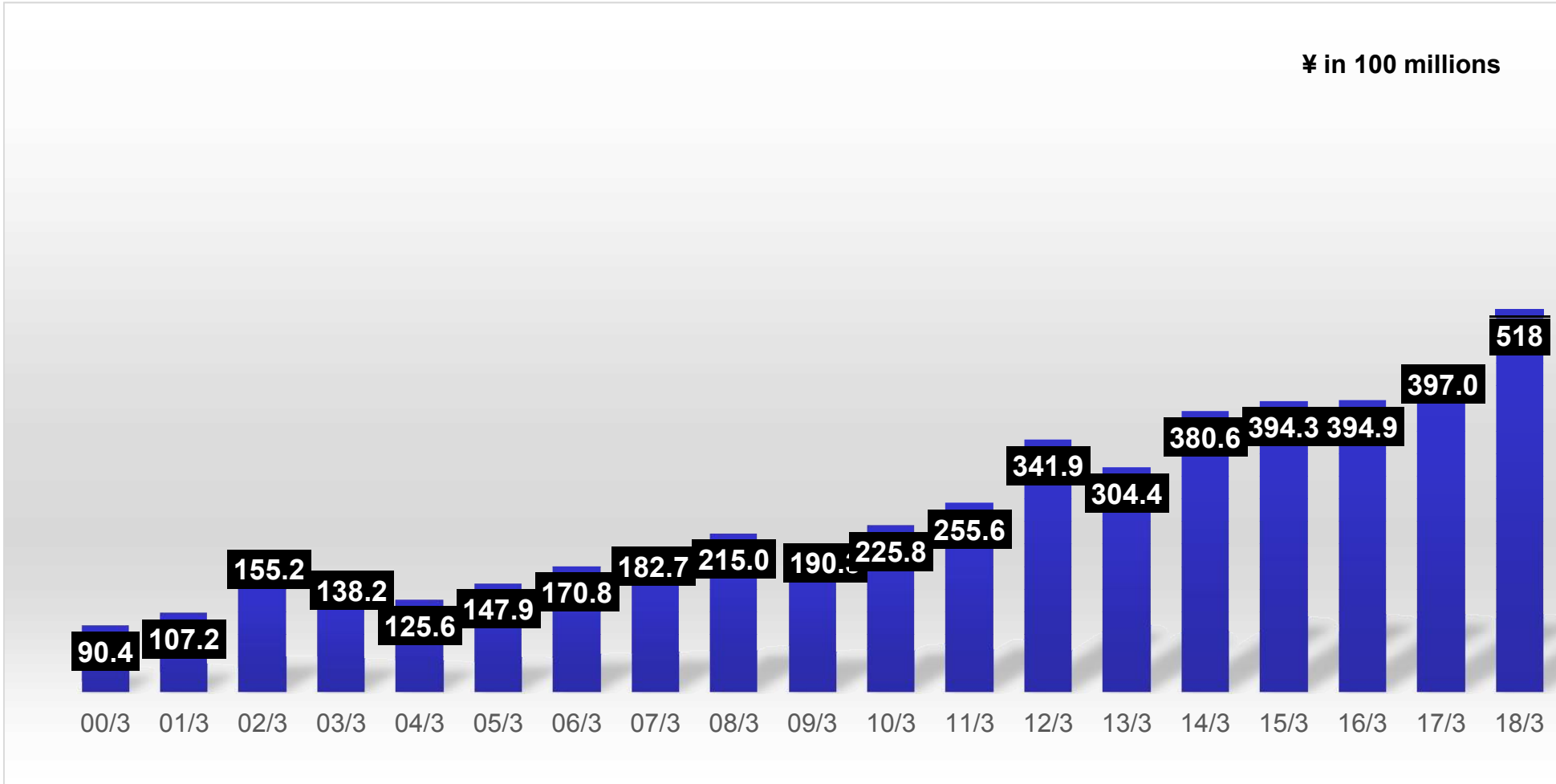
※Net income=Net income attributable to owners of parent

Note: Exchange rate FY3/17⇒FY3/18 : US\$ ¥116.49→¥113.00 RMB ¥ 16.76→¥ 17.29 (as of March 31, 2018)

Transition of consolidated net assets



¥ in 100 millions



Consolidated Cash Flow



¥ in millions	FY3/17	FY3/18
Cash flow from operating activities	8,218	9,946
Income before income taxes	5,114	5,501
Depreciation	3,593	4,188
Exchange gain & loss (Δ : gain)	401	Δ134
Changes in notes & accounts receivable (Δ : increase)	Δ1,025	Δ 2,435
Changes in inventories (Δ : increase)	666	Δ 2,604
Changes in accounts payable (Δ : decrease)	2,603	3,931
Others	Δ 3,135	1,499
Cash flow from investing activities	Δ 7,070	Δ 12,388
Payments for purchase of tangible fixed assets	Δ 7,322	Δ 11,087
Proceeds from sales of tangible fixed assets	69	116
Payments for purchase of intangible fixed assets	Δ 7	Δ 1,212
Proceeds for purchase of shares of subsidiaries accompanying changes in the scope of consolidation	387	-
Others	Δ 197	Δ 204
Cash flow from financing activities	3,897	10,830
Changes in short-term borrowing	Δ 1,616	728
Proceeds from long-term debt	9,933	4,148
Payments of long-term debt	Δ 3,813	Δ 4,786
Proceeds from the issuance of bonds	0	3,245
Proceeds from the issuance of shares	19	8,712
Others	Δ 625	Δ 1,218
Changes in cash & cash equivalents	4,739	8,810
Cash and cash equivalents, beginning of year	10,038	14,778
Cash and cash equivalents, end of year	14,778	23,648

[Operating cash flow]
Income before income tax + Depreciation : ¥9,689million
Decrease in operating CF due to increase in notes & accounts receivable Δ¥2,435million
Increase in operating CF due to decreased accounts payable : ¥3,931million

[Investing cash flow]
Main content of payments for tangible fixed assets acquired
▪ Shanghai subsidiary: ¥3,485million
▪ Hangzhou subsidiary: ¥5,298million
▪ Yinchuan subsidiary: ¥1,400million

Full-Year Forecast



(¥ in million)	FY3/18	FY3/19(E)	YoY(%)
Net sales	90,597	98,000	8.2
Operating income	8,437	9,800	16.2
Ordinary income	7,157	8,500	18.8
Net income attributable to owners of parent	2,678	5,300	97.9
Capital investment	12,300	40,000	-
Depreciation	4,188	5,000	-

Note: Exchange rate FY3/18⇒FY3/19 : US\$ ¥ 112.04 → ¥ 105.00 RMB ¥ 16.63 → ¥ 16.00 (Avg. during period)

Capital investment is based on cash flow considering unprojected large-scale capital investment and accounts payable facilities at the end of previous fiscal year.

Full-Year Forecast



¥ in millions	FY3/19 Est.
Net sales	98,000
Operating income	9,800
Ordinary income	8,500
Net income attributable to owners of parent	5,300

Anticipate increased sales as a result of strengthening and newly establishing manufacturing plants for ceramics products and quartz products, due to strong demand for materials products from large semiconductor industry customers.

Sales in the semiconductor and other equipment-related segment and electronic device segments are expected to be stable. Since we conducted structural reform of photovoltaic-related business, we expect income to increase.

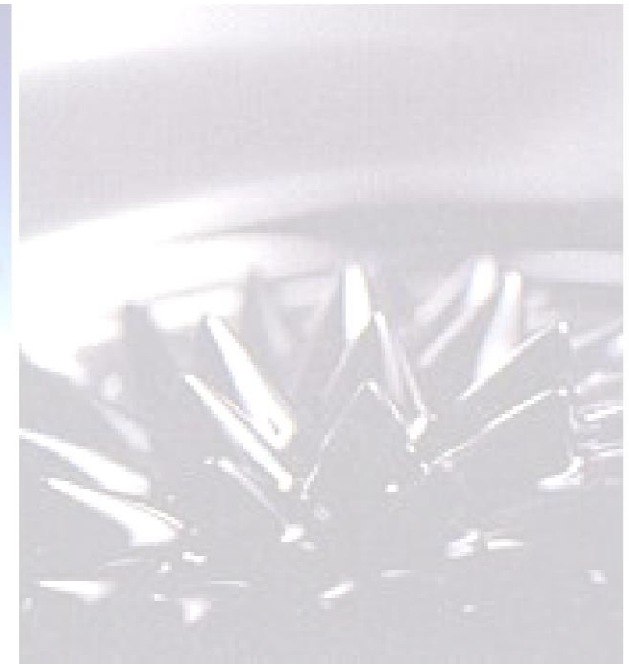
The dollar-yen foreign exchange sensitivity is 1 yen per year: the effect on the sales amount is estimated to be about 950 million yen, on operating income about 65 million yen, and interest expense is assumed to be 700 million yen

The effective tax rate is expected to be around 37%.

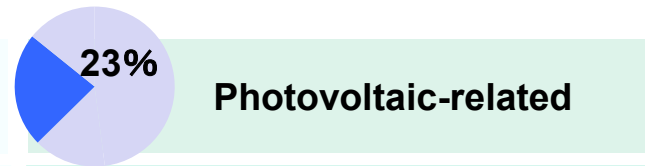
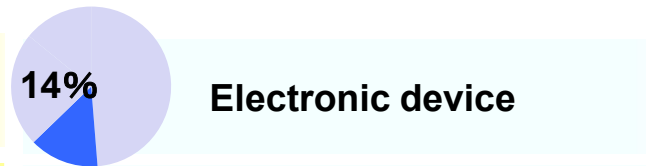
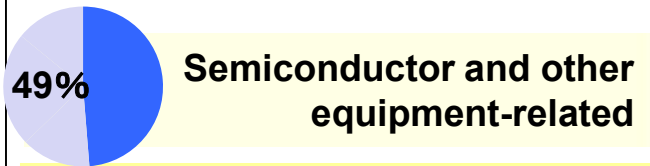
Business forecast (sales by segment)



¥ in millions	FY3/18	FY3/19(Est.)	YoY(%)
Semiconductor and other equipment-related	44,150	58,710	33.0
Vacuum Feedthroughs	11,761	15,000	27.5
Quartz	11,523	13,640	18.4
Ceramics	8,729	11,500	31.7
CVD-SiC	3,039	3,000	Δ 1.3
EB-Gun, LED	3,936	4,270	8.5
Semiconductor wafer	5,161	7,500	45.3
Parts cleaning	-	3,800	-
Electronic device	12,701	12,930	1.8
Thermo-electric module	11,634	11,880	2.1
Ferrofluid, others	1,068	1,050	Δ 1.7
Photovoltaic-related	20,938	16,207	Δ 22.6
Quartz crucibles	1,850	2,000	8.1
Solar silicon	13,066	8,317	Δ 36.3
PV manufacturing Equip.	157	120	Δ 23.6
Solar cell, Others	5,865	5,770	Δ 1.6
Others	12,807	10,153	Δ 20.7
Total	90,597	98,000	8.2



Status by Segment and Outlook



Vacuum feedthroughs

Quartz

Ceramics

CVD-SiC

Ferrofluid

Thermo-electric module

Substrates for power semiconductor

PV silicon (Ingot) [OEM]

Mono-crystal ingot

Multi-crystal ingot

PV wafer

Solar cell

125 R150

125...R165

156 R200+

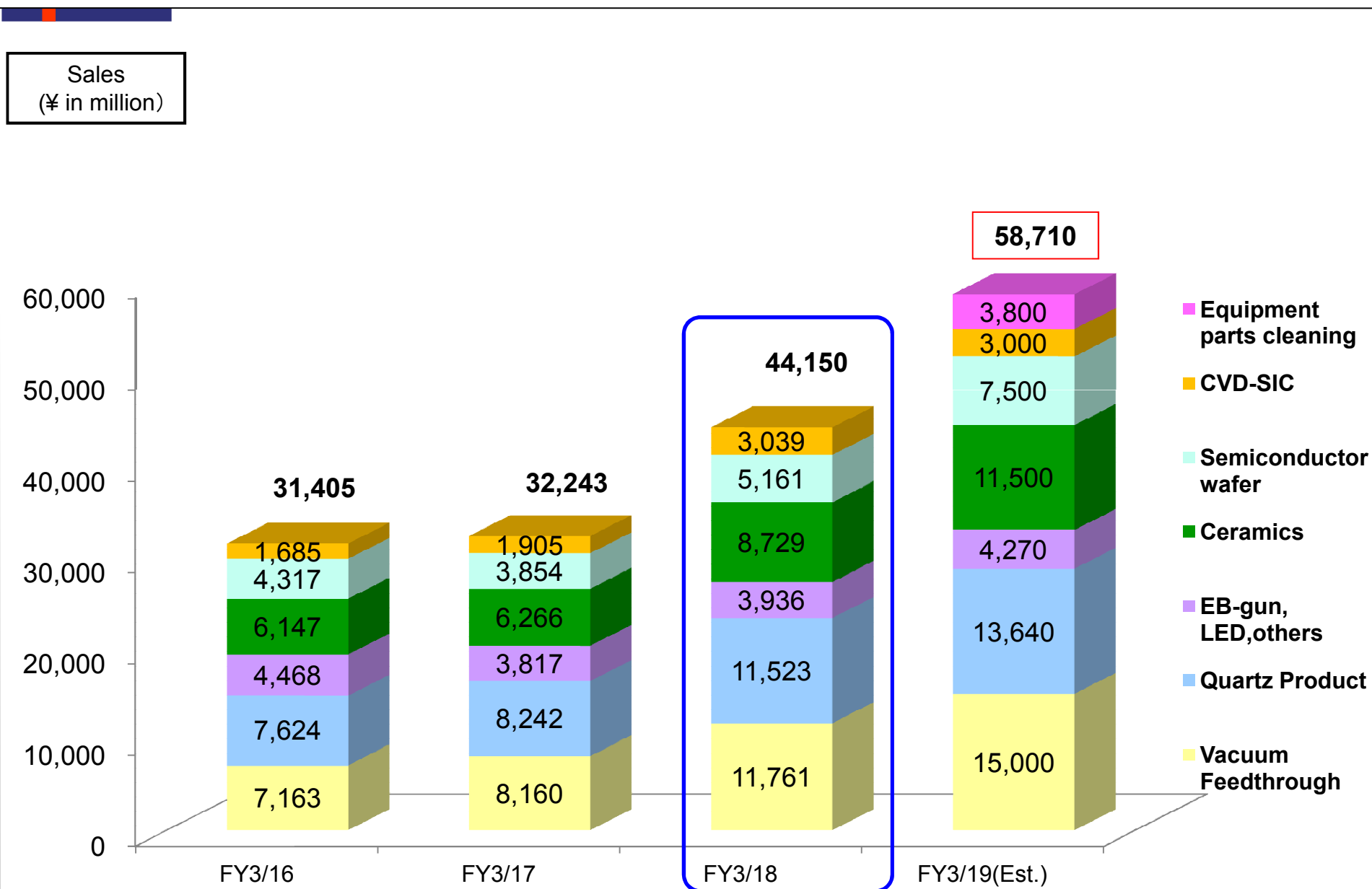
Consumable

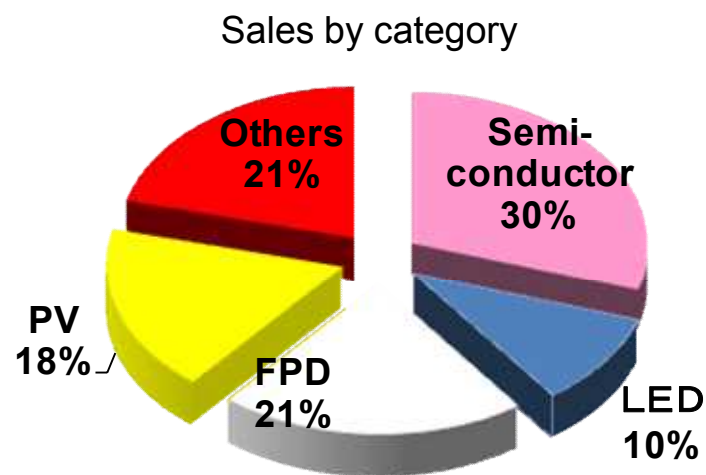
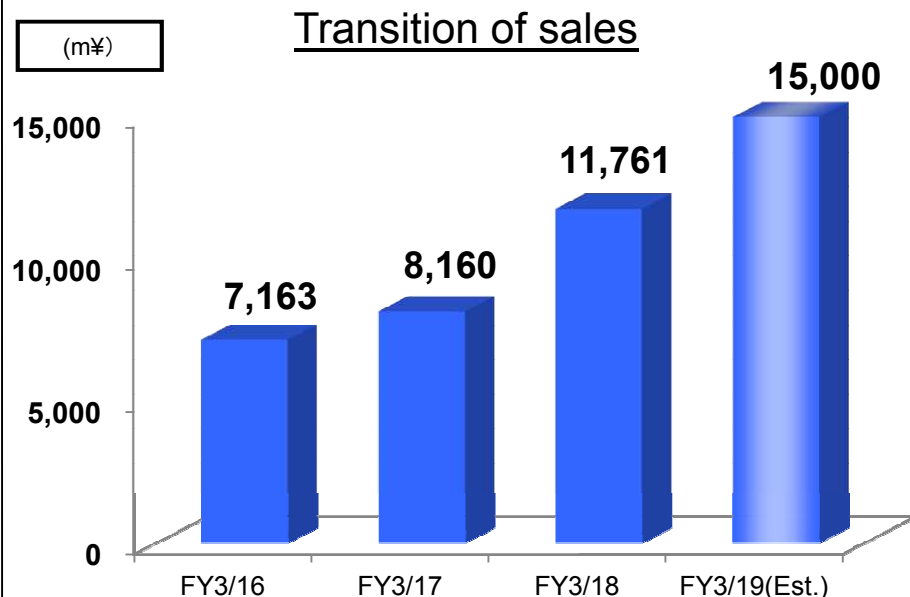
Quartz crucible

Vessel

※ The bar chart represents the pct. of each segment in FY3/18 sales

Semiconductor and other equipment-related





Note) Other: Vacuum feedthrough equipment for industrial use, aviation, medical care, science, etc.

1. Status for FY3/18

- Demand involving vacuum process semiconductor manufacturing equipment continued to grow.
- Demand for organic EL in the FPD market was strong due to investment by Chinese panel makers
- Demand for contract processing from Western and China markets increased.

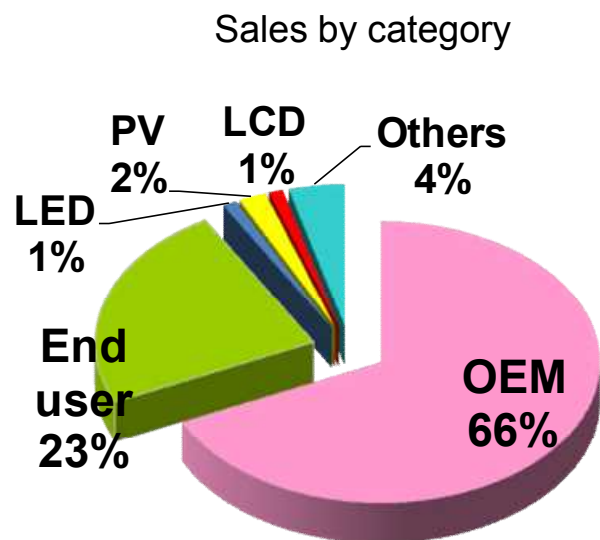
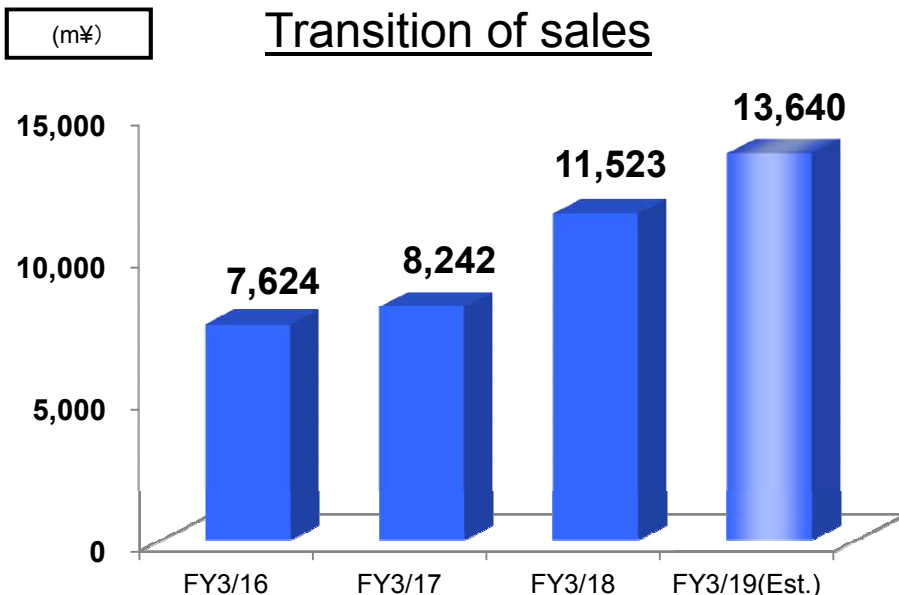
2. Outlook for FY3/19

- Demand involving vacuum process semiconductor manufacturing equipment is expected to continue to be strong.
- Demand for organic EL in the FPD market is expected to see a slight adjustment from the second half due to postponement of investment by major panel makers.
- Demand for contract processing is expected to continue to show a stronger trend, especially in the Chinese market.

<Measures>

- Continue joint development projects with manufacturers of semiconductor manufacturing equipment
- Capital investments for large processing machinery
- Strengthen ties among Ferrotec Group companies to generate synergies
- Strengthen sales activities in Asia

Status and Outlook for Quartz Products



1. Status for FY3/18

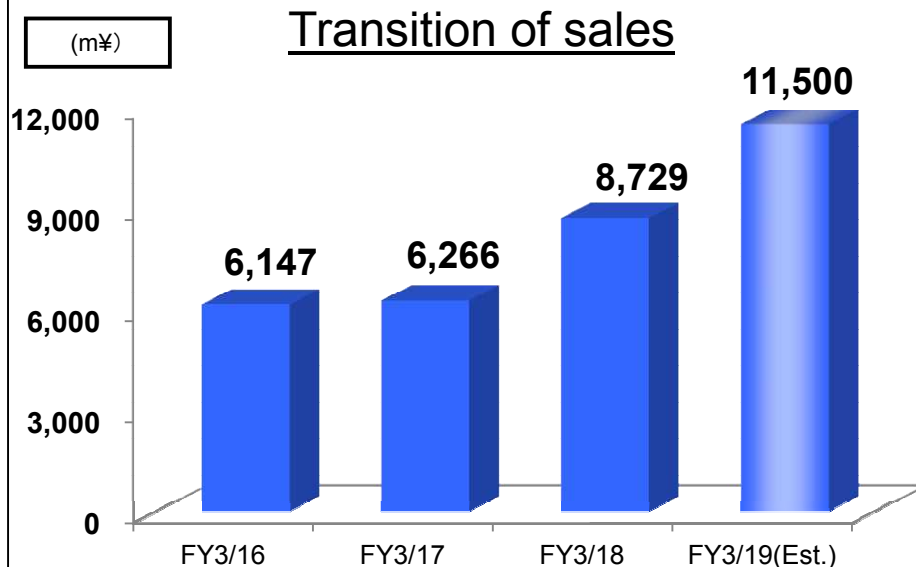
- Recorded the highest sales due to increasing demand for semiconductors
- Sales expanded due to the increase in domestic major OEMs' next-generation products
- Sales expanded due to favorable performance of US OEMs and expanded market share.
- Sales expanded due to increased orders from Taiwanese DRAM makers.
- Started supply of Si etcher parts to major domestic OEMs.

2. Outlook for FY3/19

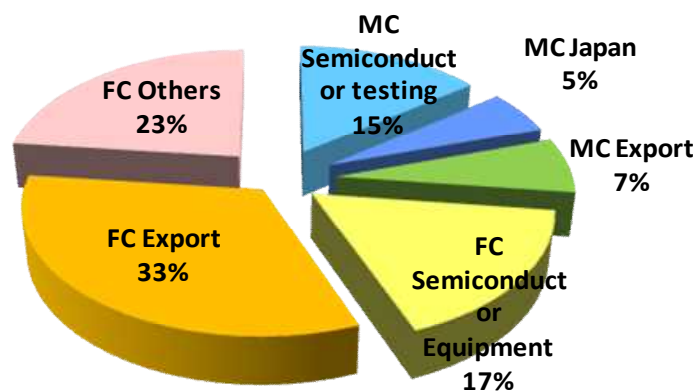
- Semiconductor investment in FY3/19 to see strong demand for investment in memory and demand in excess of supply for quartz products.
- Investment in memory systems (D-RAM, 3D-NAND), IOT, power semiconductors, in-car uses is expected to be strong. Moreover, due to full-scale investment in China FAB, demand for quartz spare parts from device manufacturers is expected to increase.
- Demand for quartz products is expected to rise thanks to increased production of Major domestic OEMs.
- Increasing trend in sales due to doubling in demand from major US OEMs.
- Start of supply of Si parts, and prospect of expansion in volume, to major domestic OEMs.

<Measures>

- Increase production capacity in response to increased demand from major OEMs . Establish new factories in China (commence construction of 2 new factories: Changshan Factory, and Dongtai Factory)
- Work more actively on development projects involving next-generation and later-generation devices. (Domestic development base, next generation development product plant scheduled to be operational in January 2019)



Sales by category



FC (Fine Ceramics) , MC (Machinable Ceramics)

1. Status for FY3/18 (Jan. - Dec.)

Machinable ceramics “Photoveel”

- In Japan, test jigs for automotive logic devices performed well
- Domestic sales of general-purpose machinery, and of medical products overseas were strong

Fine ceramics

- Demand in Japan for parts used in semiconductor manufacturing equipment and FPD equipment increased
- Overseas sales of parts used in etching equipment have been steadily increasing and new record highs achieved

2. Outlook for FY3/19 (Jan. -Dec.)

Machinable ceramics “Photoveel”

- Domestic semiconductor memory test jigs to be sluggish, but for automotive logic devices are expected to be strong
- Anticipate solid performance for domestic general-purpose machine uses and for medical products overseas

Fine ceramics

- Domestic demand for FPD equipment parts is expected to be sluggish in some areas, but semiconductor equipment parts are likely to be strong
- Overseas demand for parts used in film forming equipment and etching equipment is expected to increase further and we anticipate sales will exceed 2017 level

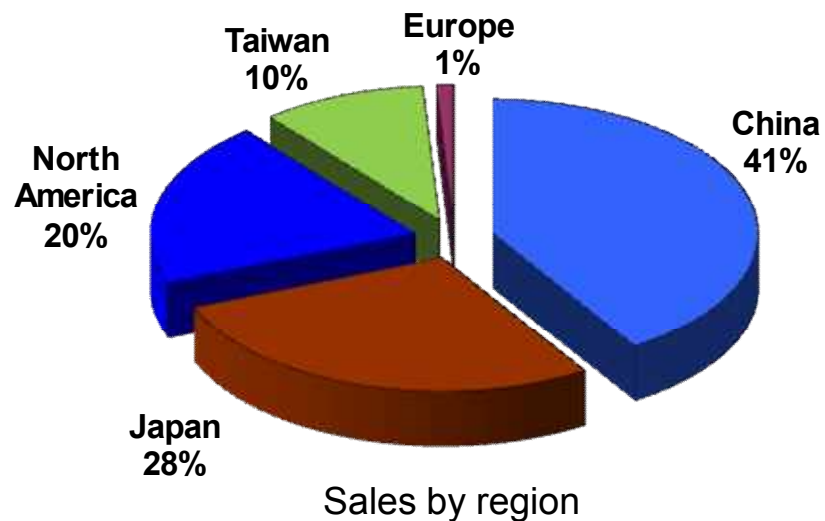
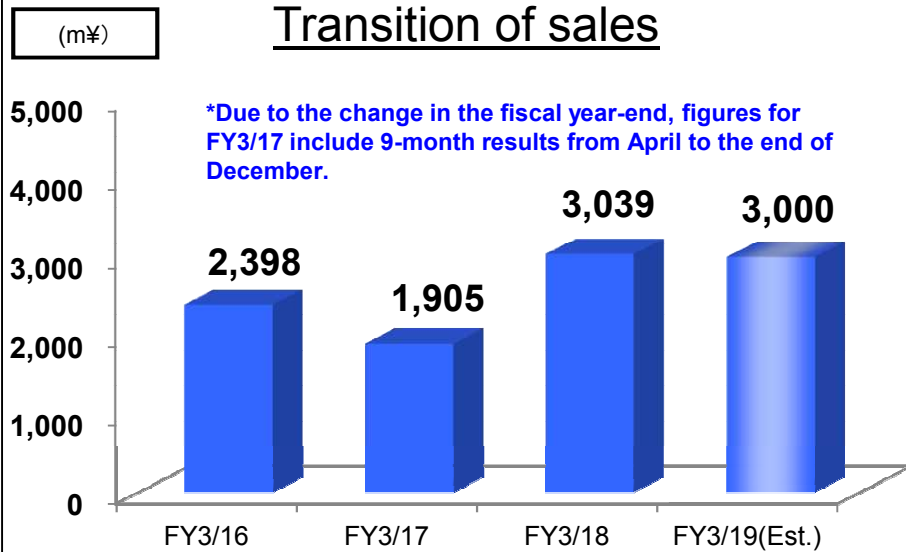
3. Continued sales policy

< Machinable ceramics >

- Work to expand sales of high precision, high added value products such as automotive applications. In addition to our existing products, we plan to expand sales into the area of heat-resistant and electrical insulation parts.

< Fine ceramics >

- With the expansion of demand for semiconductor manufacturing equipment worldwide, we established our largest-ever production system in 2017, but in order to respond to further requests for increased production, we will strive to strengthen our production system by expanding our factories and reinforcing our production lines, with the aim of increasing sales above last year’s level.



1. Status for FY3/18

- Semiconductor manufacturing equipment parts performed well in Japan and overseas in response to new investment in China
- Start mass production of new products due to the success of the aggressive development and fabrication of prototypes of new equipment parts
- Continued to utilize large facilities and accelerate entry into market for large-sized parts
- Start mass production of niche products to meet highly advanced requirements
- Aggressively entered the non-semiconductor field

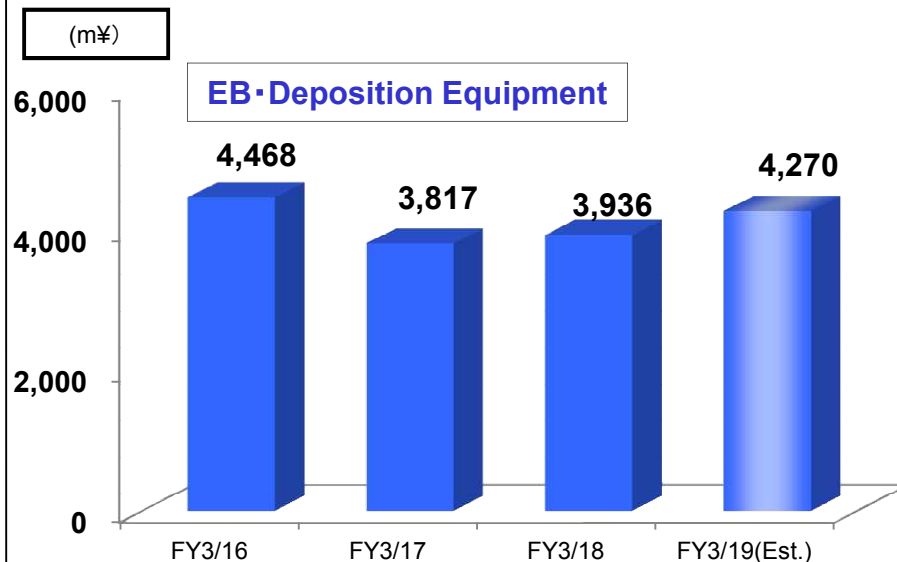
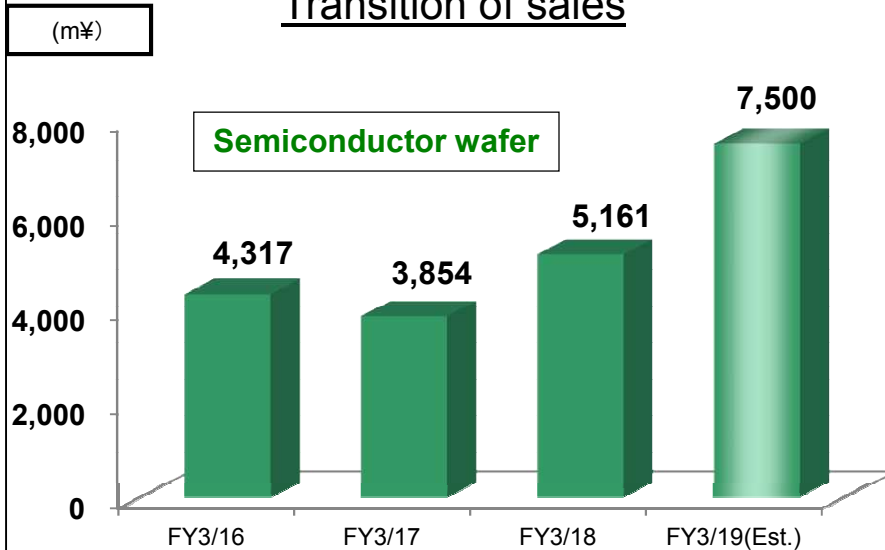
2. Outlook for FY3/19

- Foresee continued strong sales in Japan and overseas of semiconductor manufacturing equipment parts due to new investments in China
- Demand for some of the mass-produced new equipment parts is expected to slow due to adoption of alternative materials
- Start mass production of large parts
- Start handling coating products for group companies

<Measures>

- Improvement of production system capable of responding to increased demand for equipment parts from semiconductor manufacturing equipment makers
- Establishment of manufacturing company of semiconductor manufacturing equipment parts in Korea, and start of mass production
- Continue active entry into non-semiconductor fields
- Strengthen development and prototype structure

Transition of sales



Semiconductor wafers:

1. Status for FY3/18

- Demand for analog, discrete, power semiconductors was strong, and 6-inch wafers are produced at a full-scale with a monthly production capacity of 360,000 units
- Started production for mass production certification for 8-inch wafers

2. Outlook for FY3/19

- 6-inch wafers to increase production volume at a monthly production capacity of 400,000 units by the end of 2018
- 8-inch production suspended due to environmental measures. Prospect of resuming production from June

<Measures>

- 8-inches wafers to be manufactured at new Hangzhou factory that will start operations in FY2019.
- Establish a monthly production capacity of 450,000 units (including 100,000 units in Shanghai) during FY2020

EB gun and deposition equipment:

1. Status for FY3/18

- Growth in demand for equipment in the communication and filter sectors for IoT applications
- Development of new applications involving base stations for 5G networks

2. Outlook for FY3/19

- Respond to demand for equipment in the communication and filter sectors mainly for IoT applications, and expect an increase in sales compared with the previous year

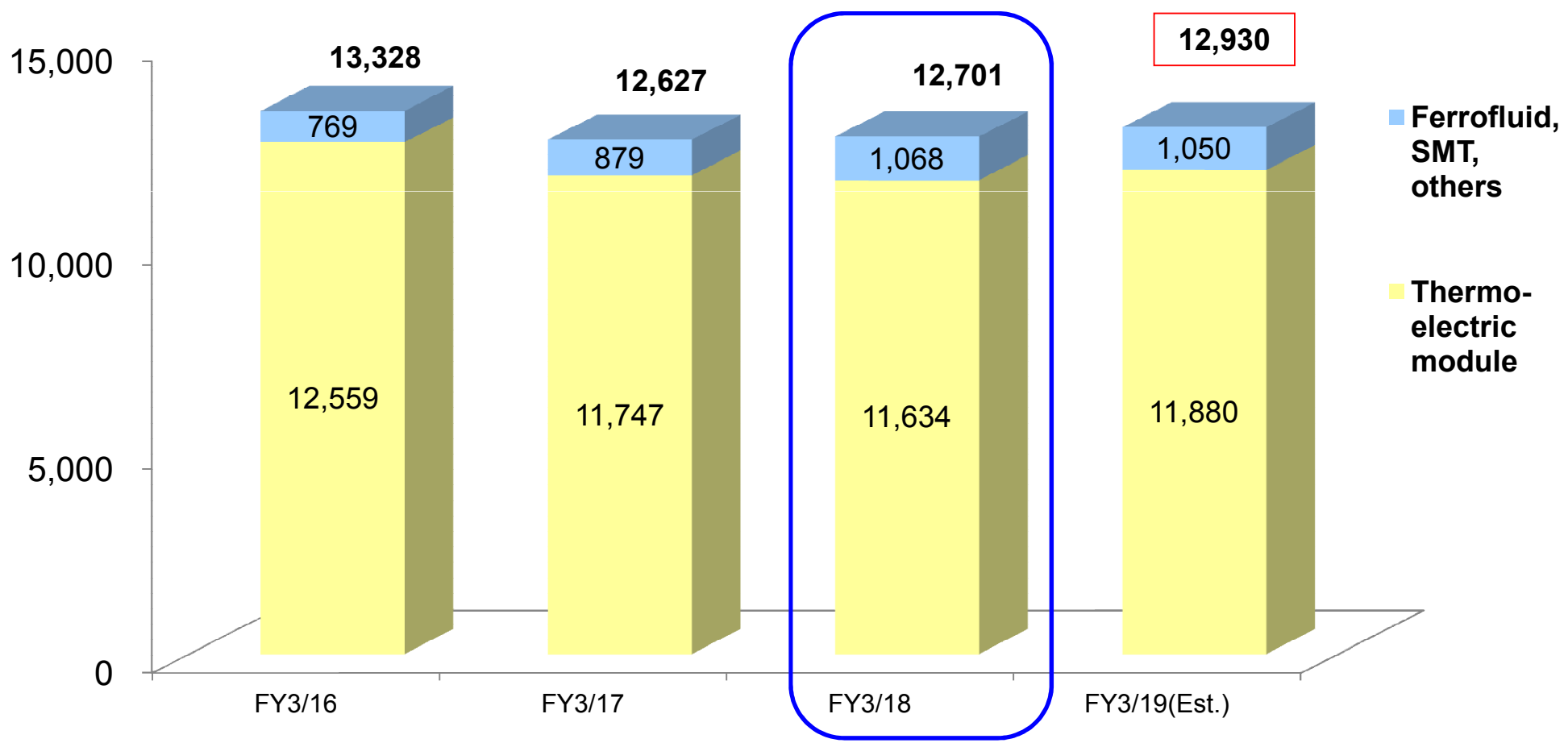
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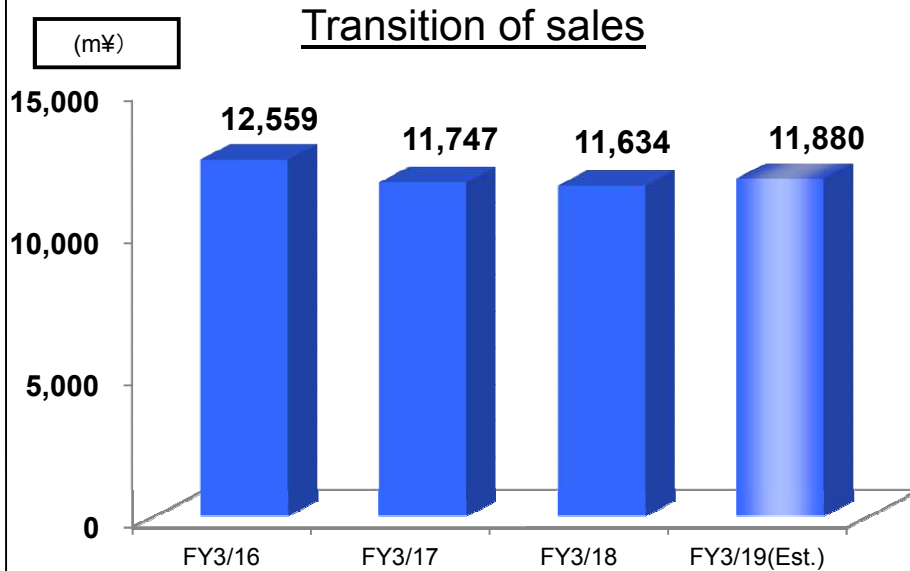
- Create more IoT applications and reinforce development activities for applications involving 5G networks, which are expected to become operational in 2019 and 2020

Electronic Device Segment



Sales
(¥ in million)





1. Status for FY3/18

Automobile Seat Application

- The performance of automobile seat application softened due to the sales situation in the US market, although there was growth in the Chinese market
- Establishment of automobile project in anticipation of future EV, automatic driving, etc.

Other Applications

- Expansion of demand for temperature control applications for semiconductor wafers, and for biotechnology inspection
- Power semiconductor substrates for industrial use, household appliances, and automobiles also expanded

2. Outlook for FY3/19

Automobile Seat Application

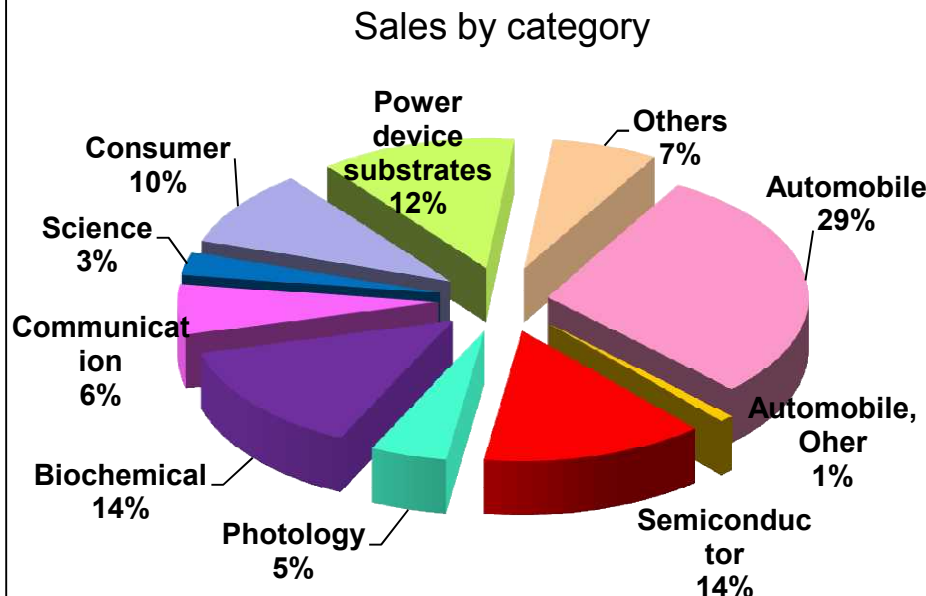
- Automobile seat application is expected to remain favorable for this fiscal year
- Focus on developing heads-up displays, battery cooling, and other new applications

Other Applications

- Semiconductor manufacturing equipment, biotechnology and medical testing equipment, and consumer etc. are expected to remain robust
- Expansion in power semiconductor substrates in response to worldwide trend towards reduction in the consumption of power

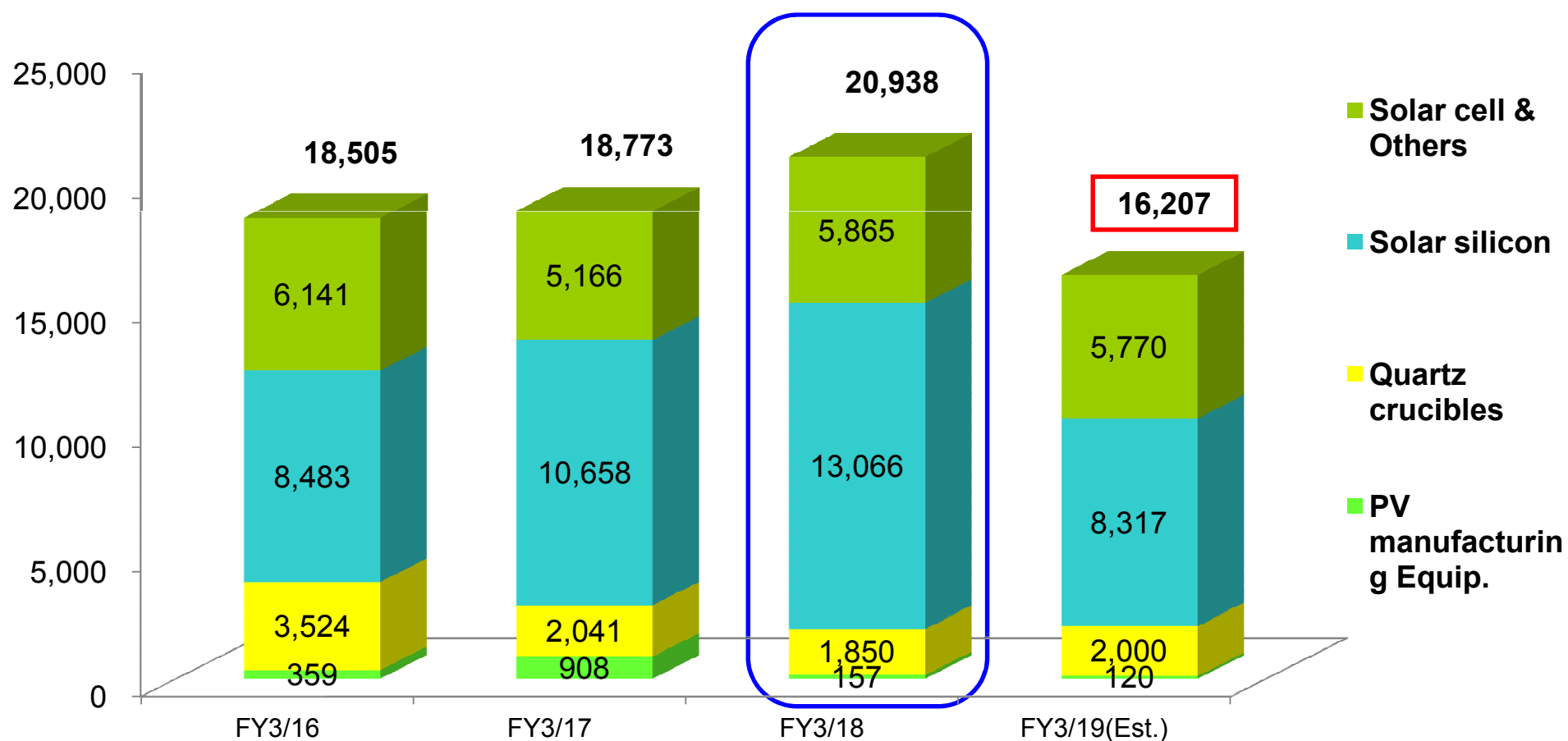
[Measures]

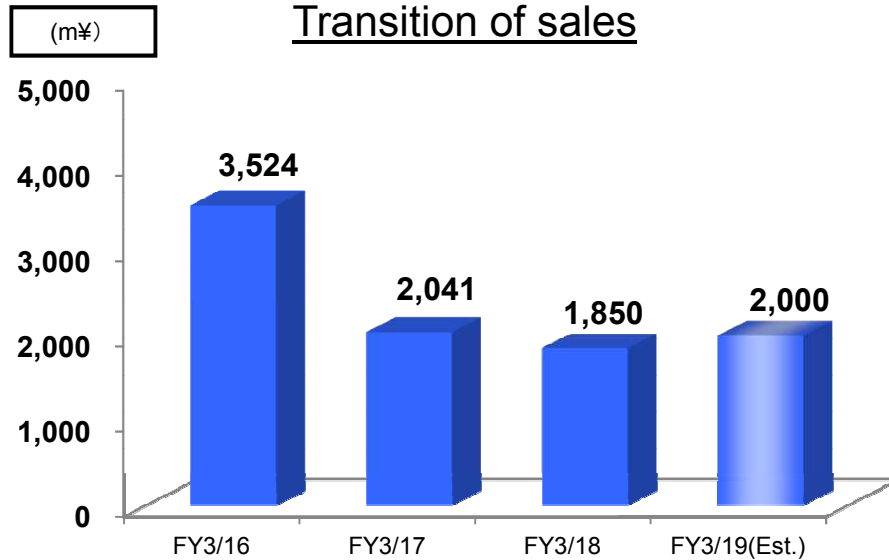
- Increase the number of sub-assembly products and strengthen sales activities (for semiconductors, medical products)
- Add new types of modules and increase the lineup of embedded products
- Continue capital investments for increasing output and using automation
- Continue to make investments for increasing the output of power semiconductor device substrates



Photovoltaic-related Segment

Sales
(¥ in million)



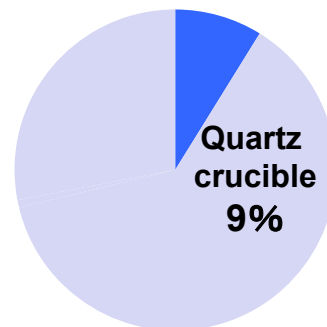


Mono-crystal quartz crucible



Multi-crystal vessel
(Withdrawal)

**Pct. Of sales
In the PV segment
FY3/18**



1. Status for FY3/18

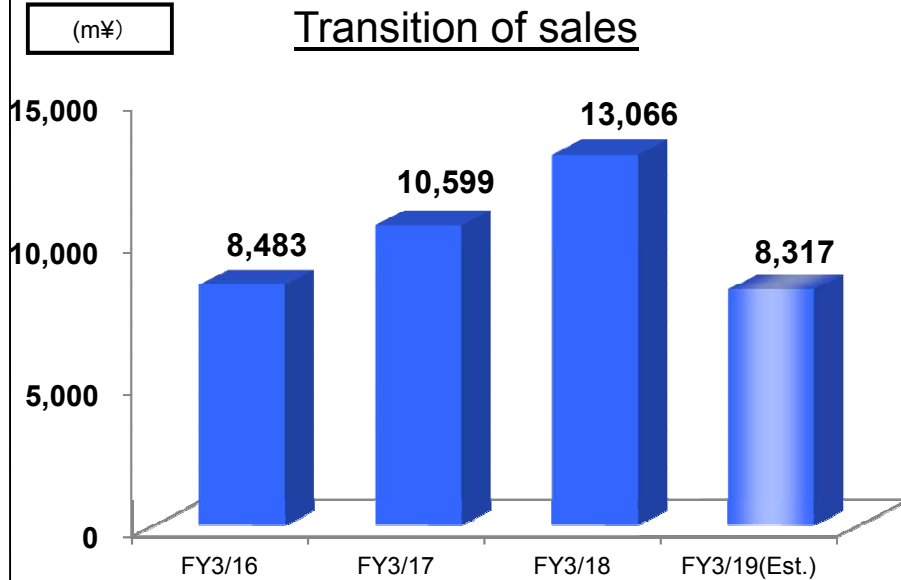
- Decline in demand for mono-crystal crucibles for solar cells (greatly decreased)
- In the area of crucibles for semiconductor applications, mono-crystal crucibles performed well thanks to the increased demand
- Withdrawal from production of unprofitable vessels for solar cell

2. Outlook for FY3/19

- Sales of mono-crystal crucibles is expected to increase as demand for crucibles for semiconductors is expected to increase
- Within this trend, an increase in the medium-diameter semiconductors is expected, but there is also a trend towards the start-up of several Chinese companies being delayed
- The focus for large crucible for solar cells is on large 28-inch diameter crucibles at present, but the possibility exists of development of 32-inch large-scale melting furnace in the future

<Measures>

- Increase sales of semiconductor crucibles by focusing on semiconductor applications
- Establish a factory dedicated to semiconductor crucibles (clean-up, automation of post processing) (New building scheduled to be completed in September 2018)
- Efforts to develop a 32-inch crucible



Mono-crystal ingot



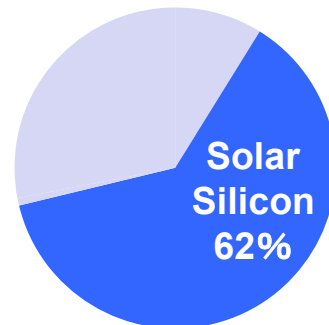
Multi-crystal ingot



PV wafer

**Pct. Of sales
In the PV segment**

FY3/18



1. Status for FY3/18

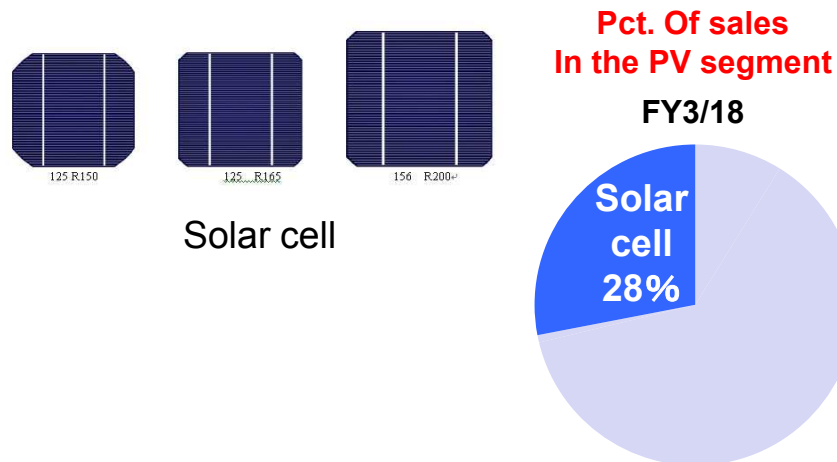
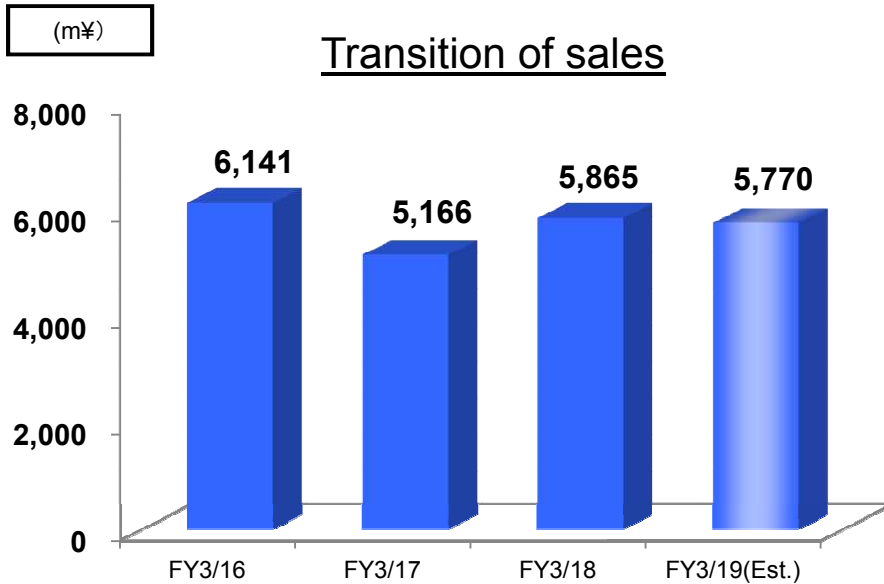
- Ensured profitability for the whole range of silicon products due to accelerated demand from China towards the end of 2017 and securing capacity utilization ratio for mono-crystal N-type wafers
- Although the introduction volume worldwide reached 96 GW per year (a 26% increase year-on-year), wafer prices fell from the beginning of 2018 due to increased production by major Chinese manufacturers and a temporal decrease in demand

2. Outlook for FY3/19

- Volume of N-type wafers is expected to increase due to the expansion of evaluation certifications
- Aiming to secure capacity utilization ratio and profitability by concentrating on OEM for polycrystals
- In FY2018, worldwide introduction volume is expected to be mark out an expanding trend, but the slump in wafer prices is a challenge

<Measures>

- Further pursue process of thinner wire technology with fixed abrasive grains
- Respond to customers' demands for improvement in the performance of low-oxygen N-type mono-crystals
- Focus on high-value-added products
- Continue structural reform of photovoltaic-related business will and embark on drastic improvement in business



1. Status for FY3/18

- Price declines and slightly weak trends in both monocrystalline and polycrystalline cells in the second half of the year
- The competitiveness in the market for PERC single crystal cells is tending to become harsher, and so we made efforts to maintain our price competitiveness by improving efficiency

2. Outlook for FY3/19

- Market environment to become yet more stringent, planning to secure profitability by operate as OEM of mono-crystals and PERC in China
- As the global introduction volume in 2018 is expected to keep expanding to 95-115 GW, secure selling prices by exploiting superiority in high conversion efficiency of PERC technology







<Measures>

- Improve profitability by using PERC technology to raise conversion efficiency
- Focus on products with high conversion efficiency and added value
- Become more competitive by using wafer quality and cell technology
- Cut costs by using automation

Company profile



Corporate Name	Ferrotec Holdings Corporation
Date of Foundation	September 27, 1980
Address	Nihonbashi Plaza Building, 2-3-4, Nihonbashi, Chuo-ku, Tokyo Japan
Listed	JASDAQ (Listed Code: 6890)
President	Akira Yamamura
Business Segment	Business management, R&D operations of group companies
Capital	17,607,000,000 JPY
Issued Stock	37,096,702 shares (including 93,568 shares of treasury stock)
Related Company	[35 Consolidated Subsidiary] [6 Companies Accounted for by the Equity Method]
Employees	[Consolidated] 6,719 [Non-consolidated]80

1980~	1990~	2000~
<p>Started manufacturing and selling products using ferrofluids (computer seals, vacuum feedthroughs)</p> <p>Vacuum Feedthroughs</p> 	<p>92 – Started manufacturing and selling thermo-modules and modules in China 98 – Started manufacturing and selling quartz products for the semiconductor industry</p> <p>Thermo-electric module</p>  <p>Quartz</p> 	<p>02 – Started contract manufacturing service business for silicon wafer processing, machine tool production and other activities (Shanghai factory) 05 – Started photovoltaic products business; started manufacturing and selling machinery and crucibles for manufacturing silicon ingots and crystals 08 – Started manufacturing and selling ceramic products</p> <p>Ingot</p>  <p>Single crystal silicon growing furnaces</p>  <p>Machinable Ceramics</p> 

With a core of ferrofluid expertise

~ Ferrotec's core Technology ~

Establishing operations in other countries

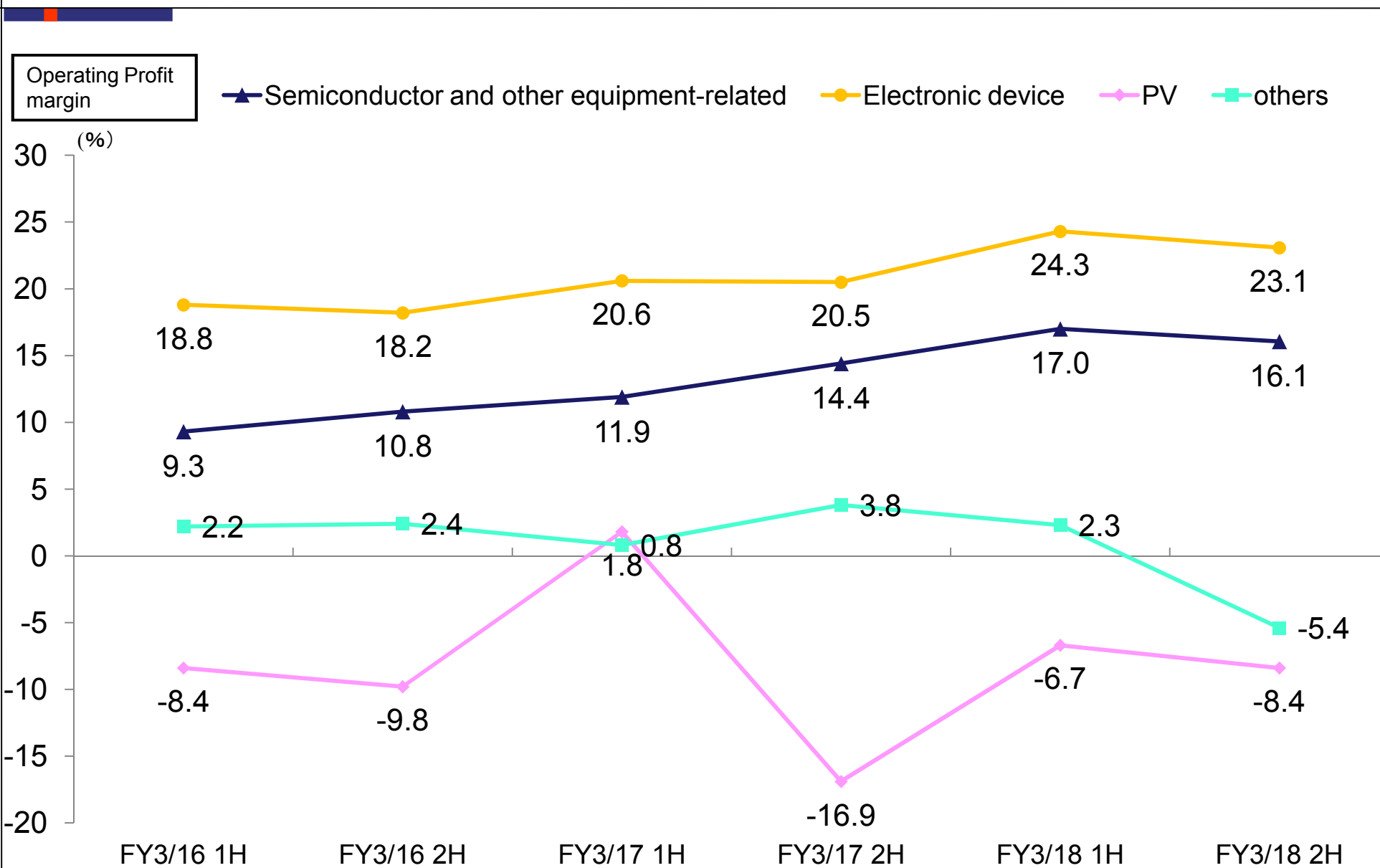
91: Established subsidiary in Massachusetts, **USA**
92: Established subsidiary in Hangzhou, **China**
95: Established subsidiary in Shanghai, **China**
97: Established subsidiary in **Singapore**
99: Started operations in **North America** and **Europe** by acquiring Ferrofluidics

Building a new profit structure

02: Started contract manufacturing service (CMS) business at the Shanghai factory, including silicon wafer processing, machine tool production and other activities
Expertise in production technologies extending from component processing to final assembly allowed Ferrotec to start the CMS business

05 : Increased manufacturing and sales activities for photovoltaic products in Hangzhou, China

Operating Margin by Business Segment



Strategies for M&A and Alliances



Time	Company acquired/Alliance partner	Description
April. 2017	Transition to a holding company structure, change of company name	Changed company name to Ferrotec Holdings Co., Ltd.
July 2016	Acquired Asahi Seisakusho Co., Ltd.	Acquired a major business-use laundry equipment manufacturer
July 2015	Acquired ADMAP Inc.	Acquired ADMAP which manufactures and sells CVD-SiC products
Oct. 2011	Merged with a subsidiary	Merged with Ferrotec silicon which manufactures and sells single crystal silicon products
Sep. 2010	Established a joint venture manufacturing and sales company	Ferrotec, a local subsidiary and Covalent Materials agreed to establish a joint venture "Hangzhou Solartech Co., Ltd." to manufacture and sell vessels and related products.
Jul. 2010	Acquired shares of IMI in the US	Began sales of pure silicon products
April. 2010	Merged with a subsidiary	Merged with Ferrotec Quartz which manufactures and sells quartz products
Jan. 2010	Acquired the Temescal Division of Edwards Vacuum	Acquired the Temescal Division of Edwards Vacuum which is the leading manufacturer and distributor of electron beam-based evaporative coating systems.
July. 2008	Acquired of Sumikin Ceramics. Changed the name of the company.	Acquired 90% of the surviving company Sumikin Ceramics & Quartz Co., Ltd. after spinning of its business except the ceramics business, converted it into a subsidiary, became "Ferrotec Ceramics" and made it a wholly owned subsidiary in 2013
Dec. 2007	Jointly established an assembly sales company in Korea.	Established "CMC Ferrotec" with the local company for the manufacture of solar cell manufacturing equipment.
April. 2007	Established a joint venture Manufacturing Corporation in Korea	Established joint venture corporation Ferrotec Korea Co.Ltd with Korean Company(KSMC Corp) for manufacturing Vacuum Feedthrough.
Nov. 2006	Merger and liquidation	Merged with Ferrotec Precision, which produces Vacuum feedthrough. Liquidated two subsidiaries(Dec.).
Sep. 2006	Established a joint venture in Taiwan	Established Ferrotec Taiwan jointly with a local partner to sell vacuum feedthroughs and offer maintenance services
Dec. 2005	Established a joint venture with LTD Ceramics Inc. (USA)	Established joint venture in China to manufacture ceramics
July 2005	Acquired NORD Co., Ltd.(Russia)	Acquired company that manufactures and sells Peltier (thermoelectric) devices in order to increase share of global market
May 2005	Business alliance with KSM Inc.(Korea)	Alliance for mutual sales of vacuum feedthroughs and products associated with semiconductor manufacturing equipment
July 2004	Exclusive contract with Applied Films(Germany)	Gave this company exclusive rights to purchase Ferrotec vacuum feedthroughs
Oct. 2003	Business and financial alliance with Aliontek	Technology alliance with ALIONTEK CORPORATION, which has technology for the grinding of quartz products, strengthened manufacturing technology for quartz products in China
Feb. 2002	Business alliance with Toshiba Ceramics and Mitsui Co. for wafer production by commissioning	Ferrotec silicon wafer production equipment moved to China factory to conduct a CMS business, and manufacturing is outsourced to this factory

Business performance (FY3/18 revised plan vs. results)



¥ in millions	FY3/18 revised plan		FY3/18 Results			
	Amount	Pct. Of Sales(%)	Amount	Pct. Of Sales(%)	Amount	Pct. change(%)
Equipment-related	41,694	49.1	44,150	48.7	2,456	5.9
Vacuum Feedthroughs	10,937	12.9	11,761	13.0	824	7.5
Quartz	10,700	12.6	11,523	12.7	823	7.7
Ceramics	8,075	9.5	8,729	9.6	654	8.1
CVD-SiC	3,304	3.9	3,039	3.4	△ 265	△ 8.0
EB-Gun, LED	3,772	4.4	3,936	4.3	164	4.4
Semiconductor Wafer	4,906	5.8	5,161	5.7	255	5.2
Electronic device	12,407	14.6	12,701	14.0	294	2.4
Thermo-electric module	11,476	13.5	11,634	12.8	158	1.4
Ferrofluid, others	931	1.1	1,068	1.2	137	14.7
Photovoltaic-related	18,978	22.3	20,938	23.1	1,960	10.3
Quartz crucibles	1,645	1.9	1,850	2.0	205	12.5
Solar silicon	11,755	13.8	13,066	14.4	1,311	11.2
PV manufacturing Equip.	105	0.1	157	0.2	52	49.5
Solar cell, Others	5,473	6.4	5,865	6.5	392	7.2
Others	11,921	14.0	12,807	14.1	886	7.4
Total	85,000	100.0	90,597	100.0	5,597	6.6
Gross income	23,900	28.1	24,915	27.5	1,015	4.2
SG&A expenses	15,400	18.1	16,478	18.2	1,078	7.0
Operating income	8,500	10.0	8,437	9.3	△ 63	△ 0.7
Ordinary income	7,500	8.8	7,157	7.9	△ 343	△ 4.6
Net income	4,400	5.2	2,678	3.0	△ 1,722	△ 39.1

*Net income=Net income attributable to owners of parent

*Some figures are rounded.

Business performance (FY3/18 1st half vs. 2nd half)



¥ in millions	FY3/18 1 st half		FY3/18 2 nd half			
	Amount	Pct. Of Sales(%)	Amount	Pct. Of Sales(%)	Amount	Pct(%)
Semiconductor and other equipment-related	20,617	48.0	23,532	49.4	2,915	14.1
Vacuum Feedthroughs	5,622	13.1	6,139	12.9	517	9.2
Quartz	5,153	12.0	6,370	13.4	1,217	23.6
Ceramics	4,087	9.5	4,642	9.7	555	13.6
CVD-SiC	1,643	3.8	1,396	2.9	△ 247	△ 15.0
EB-Gun, LED	1,674	3.9	2,262	4.8	588	35.1
Semiconductor wafer	2,438	5.7	2,723	5.7	285	11.7
Electronic device	6,305	14.7	6,397	13.4	92	1.5
Thermo-electric module	5,853	13.6	5,781	12.1	△ 72	△ 1.2
Ferrofluid, Others	452	1.1	616	1.3	164	36.3
Photovoltaic-related	9,972	23.2	10,967	23.0	995	10.0
Quartz crucibles	811	1.9	1,039	2.2	228	28.1
Solar silicon	6,078	14.1	6,988	14.7	910	15.0
PV manufacturing Equip.	77	0.2	80	0.2	3	3.9
Solar cell, Others	3,006	7.0	2,859	6.0	△ 147	△ 4.9
Others	6,090	14.2	6,718	14.1	628	10.3
Total	42,984	100.0	47,613	100.0	4,629	10.8
Gross income	12,294	28.6	12,621	26.5	327	2.7
SG&A expenses	7,796	18.1	8,682	18.2	886	11.4
Operating income	4,498	10.5	3,939	8.3	△ 559	△ 12.4
Ordinary income	3,857	9.0	3,301	6.9	△ 556	△ 14.4
Net income	2,299	5.3	379	0.8	△ 1,920	△ 83.5

*Net income=Net income attributable to owners of parent

*Some figures are rounded.

Business performance (FY3/17 vs. FY3/18)



¥ in millions	FY3/17 Results		FY3/18 Results			
	Amount	Pct. Of Sales(%)	Amount	Pct. Of Sales(%)	Amount	Pct. change(%)
Semiconductor and other equipment-related	32,243	43.7	44,150	48.7	11,907	36.9
Vacuum Feedthroughs	8,160	11.0	11,761	13.0	3,601	44.1
Quartz	8,242	11.2	11,523	12.7	3,281	39.8
Ceramics	6,266	8.5	8,729	9.6	2,463	39.3
CVD-SiC	1,905	2.6	3,039	3.4	1,134	59.5
EB-Gun, LED	3,817	5.2	3,936	4.3	119	3.1
Semiconductor wafer	3,854	5.2	5,161	5.7	1,307	33.9
Electronic device	12,627	17.1	12,701	14.0	74	0.6
Thermo-electric module	11,747	15.9	11,634	12.8	△ 113	△ 1.0
Ferrofluid, others	879	1.2	1,068	1.2	189	21.5
Photovoltaic-related	18,773	25.4	20,938	23.1	2,165	11.5
Quartz crucibles	2,041	2.8	1,850	2.0	△ 191	△ 9.4
Solar silicon	10,599	14.4	13,066	14.4	2,467	23.3
PV manufacturing Equip.	967	1.3	157	0.2	△ 810	△ 83.8
Solar cell, Others	5,166	7.0	5,865	6.5	699	13.5
Others	10,204	13.8	12,807	14.1	2,603	25.5
Total	73,847	100.0	90,597	100.0	16,750	22.7
Gross income	19,709	26.7	24,915	27.5	5,206	26.4
SG&A expenses	14,031	19.0	16,478	18.2	2,447	17.4
Operating income	5,678	7.7	8,437	9.3	2,759	48.6
Ordinary income	5,675	7.7	7,157	7.9	1,482	26.1
Net income	3,256	4.4	2,678	3.0	△ 578	△ 17.8
Capital Investment	7,322	-	11,087	-	3,765	51.4
Depreciation	3,593	-	4,188	-	595	16.6

*Capital investment is based on cash flow considering unprojected large-scale capital investment and accounts payable facilities at the end of previous fiscal year.

*Some figures are rounded.

Business performance (FY3/18 vs. FY3/19 Revised Plan)



¥ in millions	FY3/18 Results		FY3/19 Revised Plan			
	Amount	Pct. Of Sales(%)	Amount	Pct. Of Sales(%)	Amount	Pct(%)
Semiconductor and other equipment-related	44,150	48.7	58,710	59.9	14,561	33.0
Vacuum Feedthroughs	11,761	13.0	15,000	15.3	3,239	27.5
Quartz	11,523	12.7	13,640	13.9	2,118	18.4
Ceramics	8,729	9.6	11,500	11.7	2,771	31.7
CVD-SiC	3,039	3.4	3,000	3.1	△ 40	△ 1.3
EB-Gun, LED	3,936	4.3	4,270	4.4	334	8.5
Semiconductor wafer	5,161	5.7	7,500	7.7	2,339	45.3
Equipment parts cleaning	-	-	3,800	3.9	3,800	-
Electronic device	12,701	14.0	12,930	13.2	230	1.8
Thermo-electric module	11,634	12.8	11,880	12.1	246	2.1
Ferrofluid, Others	1,068	1.2	1,050	1.1	△ 17	△ 1.6
Photovoltaic-related	20,938	23.1	16,207	16.5	△ 4,731	△ 22.6
Quartz crucibles	1,850	2.0	2,000	2.0	150	8.1
Solar silicon	13,066	14.4	8,317	8.5	△ 4,749	△ 36.3
PV manufacturing Epuip.	157	0.2	120	0.1	△ 37	△ 23.6
Solar cell, Others	5,865	6.5	5,770	5.9	△ 95	△ 1.6
Others	12,807	14.1	10,153	10.4	△ 2,655	△ 20.7
Total	90,597	100.0	98,000	100.0	7,403	8.2
Gross income	24,915	27.5	27,900	28.5	2,985	12.0
SG&A expenses	16,477	18.2	18,100	18.5	1,622	9.8
Operating income	8,437	9.3	9,800	10.0	1,363	16.2
Ordinary income	7,157	7.9	8,500	8.7	1,343	18.8
Net income	2,678	3.0	5,300	5.4	2,622	97.9
Capital Investment	12,300	-	40,000	-	27,700	-
Depreciation	4,188	-	5,000	-	812	-

*Capital investment is based on cash flow considering unprojected large-scale capital investment and accounts payable facilities at the end of previous fiscal year.

*Some figures are rounded.

Business performance (FY3/19 1st half vs. 2nd half)



¥ in millions	FY3/19 1 st half		FY3/19 2 nd half			
	Amount	Pct. Of Sales(%)	Amount	Pct. Of Sales(%)	Amount	Pct. change(%)
Semiconductor and other equipment-related	28,460	61.9	30,250	58.2	1,790	6.3
Vacuum Feedthroughs	7,800	17.0	7,200	13.8	△ 600	△ 7.7
Quartz	6,830	14.8	6,811	13.1	△ 19	△ 0.3
Ceramics	5,550	12.1	5,950	11.4	400	7.2
CVD-SiC	1,450	3.2	1,549	3.0	99	6.8
EB-Gun, LED	2,070	4.5	2,200	4.2	130	6.3
Semiconductor wafer	2,960	6.4	4,540	8.7	1,580	53.4
Equipment parts cleaning	1,800	3.9	2,000	3.8	200	11.1
Electronic device	5,860	12.7	7,071	13.6	1,211	20.7
Thermo-electric module	5,350	11.6	6,530	12.6	1,180	22.1
Ferrofluid, Others	510	1.1	541	1.0	31	6.1
Photovoltaic-related	6,420	14.0	9,787	18.8	3,367	52.5
Quartz crucibles	900	2.0	1,100	2.1	200	22.2
Solar silicon	2,800	6.1	5,517	10.6	2,717	97.0
PV manufacturing Equip.	119.8	0.3	0.2	0.0	△ 120	△ 99.8
Solar cell, Others	2,600	5.7	3,170	6.1	570	21.9
Others	5,261	11.4	4,891	9.4	△ 369	△ 7.0
Total	46,000	100.0	52,000	100.0	6,000	13.0
Gross income	13,079	28.4	14,821	28.5	1,742	13.3
SG&A expenses	8,479	18.4	9,621	18.5	1,142	13.5
Operating income	4,600	10.0	5,200	10.0	600	13.0
Ordinary income	3,900	8.5	4,600	8.8	700	17.9
Net income	2,400	5.2	2,900	5.6	500	20.8

*Some figures are rounded.