

The background of the slide features a large, semi-transparent Ferro Tec logo on the left. To its right, there are several images of industrial components, including a large cylindrical metal part and various smaller mechanical parts, all rendered in a light blue and white color scheme. Below the logo, there is a list of product types: THERMOELECTRIC MODULE, COMPUTER SEAL, VACUUM FEEDTHROUGH, QUARTZ, and CMS (Contract Manufacturing Services).

Ferro Tec Holdings Corporation

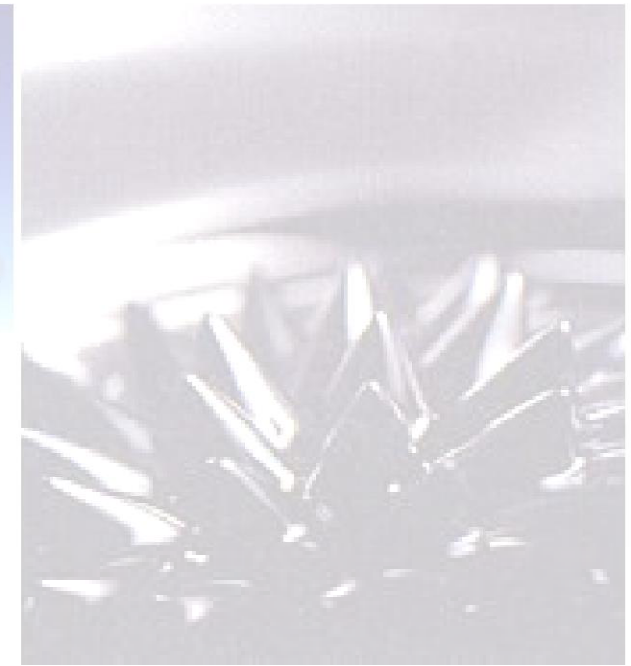
Results for the 1st half of the fiscal year ending March 31, 2018

November 27, 2017

(JASDAQ 6890)

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

1. This 1st half results cover six months period from April to September of Ferrotec, and six months period from Jan. to June of consolidated subsidiaries and affiliated companies included in investment profit loss in equity method.
2. These materials were prepared for the purpose of providing information regarding the company's results of operations for the 1st half of the fiscal year ending March 31, 2018.
3. These materials were prepared based on information available as of Nov. 27, 2017. 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.



First Half of FY March 2018 Financial Results

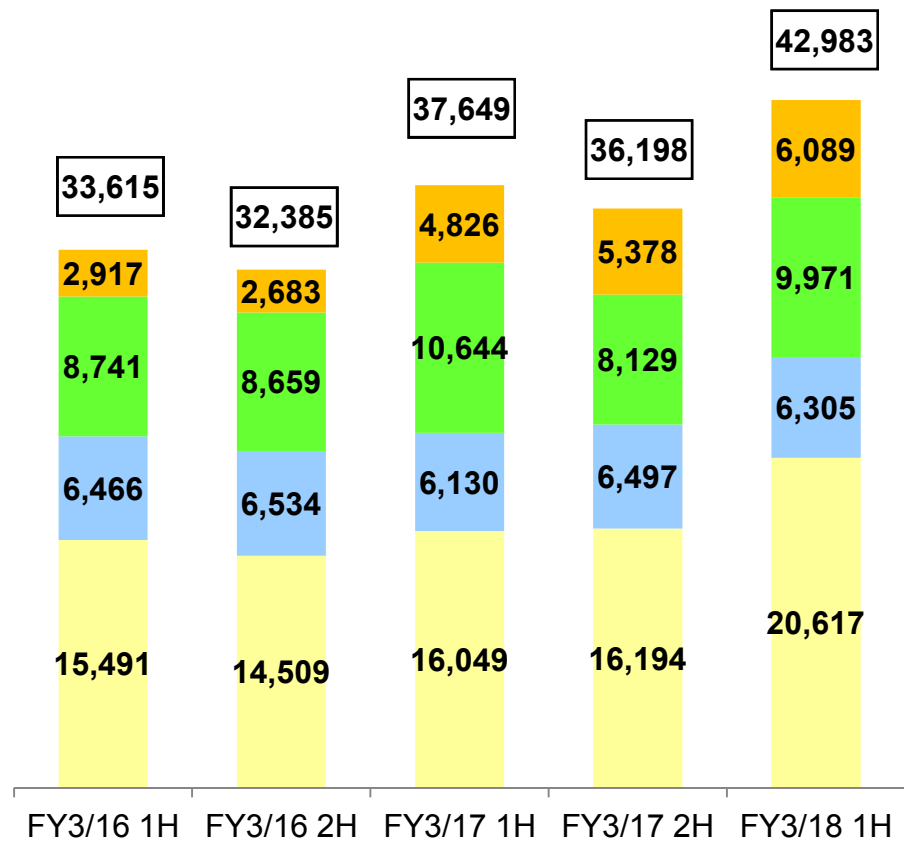
Sales and Operating income Trend



Sales Trend

(¥ in millions)

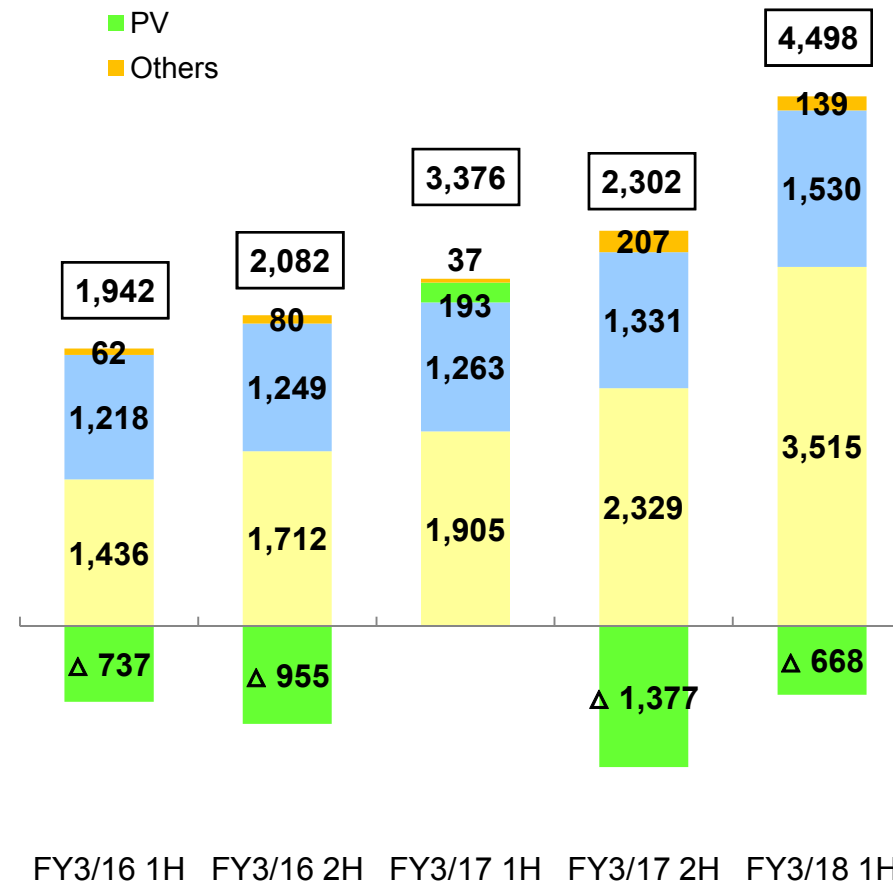
- semiconductor and other equipment-related
- Electronic device
- PV
- Others



Operating income Trend

(¥ in millions)

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



Consolidated Financial Summary



¥ in millions	FY March 2017 1 st half		FY March 2018 1 st half		YoY	
	Amount	Pct. of sales(%)	Amount	Pct. of sales(%)	Amount	Pct. of sales(%)
Net sales	37,650	100.0	42,983	100.0	5,333	14.2
Cost of sales	27,556	73.2	30,689	71.4	3,133	11.4
Gross profit	10,094	26.8	12,293	28.6	2,199	21.8
SG&A expenses	6,717	17.8	7,795	18.1	1,078	16.0
Operating profit	3,376	9.0	4,498	10.5	1,122	33.2
Non-operating income	323	0.9	255	0.6	△ 68	△ 21.1
Non-operating expense	1,592	4.2	896	2.1	△ 696	△ 43.7
Ordinary profit	2,107	5.6	3,857	9.0	1,750	83.1
Extraordinary income	2	0.0	0	-	△ 2	-
Extraordinary loss	288	0.8	54	0.1	△ 234	△ 81.3
Net income attributable to owners of parent	1,033	2.7	2,299	5.4	1,266	122.6
Capital investment	3,149	-	4,702	-	1,553	49.3
Depreciation	1,930	-	1,916	-	△ 14	△ 0.7

Consolidated Financial Summary



¥ in millions	FY March 2018 1 st half	
	Amount	Pct. of sales(%)
Net sales	42,983	100.0
Cost of sales	30,689	71.4
Gross profit	12,293	28.6
SG&A expenses	7,795	18.1
Operating profit	4,498	10.5
Non-operating income	255	0.6
Non-operating expense	896	2.1
Ordinary profit	3,857	9.0
Extraordinary income	0	-
Extraordinary loss	54	0.1
Income before income tax	3,802	8.8
Income taxes	1,483	3.5
Net income attributable to owners of parent	2,299	5.3

Sales increased in the semiconductor and other equipment-related business, and there were no significant changes in sales in other businesses. The gross profit margin increased by 1.8 point.

Higher sales in the semiconductor and other equipment-related business produced a big increase in operating income, offsetting the operating loss in the photovoltaic-related business. Total operating income increased by ¥1.1 billion and the operating margin was more than 10%.

Equity in earnings ¥ 117 million
Foreign exchange loss ¥ 312 million

There were no significant extraordinary losses in the first half of FY3/18

Net Sales and Operating Profits by Segment



*The equipment-related business segment has been renamed the semiconductor and other equipment-related business segment beginning with FY3/18

Net sales (¥ in millions)	FY March 2017 1 st half		FY March 2018 1 st half		YOY	
	Amount	Pct. Of Sales(%)	Amount	Pct. Of Sales(%)	Difference	Pct. change
Semiconductor and other equipment-related	16,049	42.6	20,617	48.0	4,568	28.5
Electronic device	6,130	16.3	6,305	14.7	175	2.9
Photovoltaic-related	10,644	28.3	9,971	23.2	△ 673	△ 6.3
Others	4,825	12.8	6,089	14.2	1,264	26.2
Total	37,650	100.0	42,983	100.0	5,333	14.2

Operating income (¥ in millions)	FY March 2017 1 st half		FY March 2018 1 st half		YOY	
	Amount	Pct. Of Sales(%)	Amount	Pct. Of Sales(%)	Difference	Pct. change
Semiconductor and other equipment-related	1,905	11.9	3,515	17.0	1,610	84.5
Electronic device	1,263	20.6	1,530	24.3	267	21.1
Photovoltaic-related	193	1.8	△668	-	△ 861	-
Others	37	0.8	139	2.3	102	275.7
Corporate & elimination	△22	-	△18	-	4	-
Total	3,376	9.0	4,498	10.5	1,122	33.2

Consolidated Balance Sheet ~Assets~



(¥ in millions)	FY3/17	FY3/18 1H	Difference
Current assets	51,245	66,493	15,248
Cash & deposits	14,778	27,166	12,388
Note & accounts receivable	17,656	19,943	2,287
Inventory	13,882	14,753	871
Fixed assets	40,855	43,994	3,139
Tangible fixed assets	34,294	37,947	3,653
Building	8,583	9,492	909
Equipment & machinery	8,454	8,864	410
Tools, furniture, and fixture	5,908	5,780	△ 128
Land	1,280	1,586	306
Intangible fixed assets	2,060	1,896	△ 164
Goodwill	769	659	△ 110
Investments & other assets	4,499	4,149	△ 350
Total assets	92,100	110,487	18,387

[Current assets]

The issuance of stock (¥8.7 billion) and bonds (¥3.3 billion) were the main reasons for the increase in cash and deposits.

Notes and accounts receivable increased along with sales and inventory increased because of strong orders.

[Main reason for increase in tangible fixed assets]

8-inch wafer equipment and facilities to raise output of ceramics and quartz were the primary reasons for this increase.

[Intangible fixed assets]

Amortization of goodwill : ¥ 114 million

Consolidated Cash Flow



(¥ in million)	FY3/17 1H	FY3/18 1H
Cash flow from operating activities	2,915	4,794
Income before income taxes	1,821	3,802
Depreciation	1,930	1,916
Exchange gain & loss (△ : gain)	644	19
Changes in notes & accounts receivable (△ : increase)	△ 2,662	△ 2,665
Changes in inventories (△ : increase)	△ 372	△ 1,053
Changes in accounts payable (△ : decrease)	2,434	1,902
Others	△ 880	873
Cash flow from investing activities	△ 2,779	△ 4,640
Payments for purchase of tangible fixed assets	△ 3,149	△ 4,702
Proceeds from sales of tangible fixed assets	48	73
Proceeds for purchase of shares of subsidiaries accompanying changes in the scope of consolidation	387	-
Others	△ 65	△ 11
Cash flow from financing activities	3,689	12,311
Changes in short-term borrowing	△ 636	472
Proceeds from long-term debt	6,590	2,485
Payments of long-term debt	△ 1,885	△ 2,178
Proceeds from the issuance of bonds	-	3,245
Proceeds from the issuance of stock	-	8,659
Payments for dividend	△ 307	△ 370
Others	△ 73	△ 2
Changes in cash & cash equivalents	2,526	12,327
Cash and cash equivalents, beginning of year	10,038	14,778
Cash and cash equivalents, end of year	12,564	27,166

[Operating cash flow]
Income before income tax + Depreciation ¥ 5,718 million
Decrease in operating CF due to increase in notes & accounts receivable △¥ 2,665 million
Decrease in operating CF due to increase in inventories △¥ 1,053 million
Increase in operating CF due to increased accounts payable : ¥ 1,902 million
[Investing cash flow]
Main content of payments for tangible fixed assets acquired <ul style="list-style-type: none"> • Shanghai subsidiary: ¥ 1,576 million • Hangzhou subsidiary: ¥ 1,522 million • Yinchuan subsidiary: ¥ 595 million
[Financing cash flow]
Proceeds from the issuance of bonds: ¥ 3,245 million
Proceeds from the issuance of stock: ¥ 8,659 million

Full-Year Forecast (revised on Nov.14)



(¥ in million)	FY3/17	FY3/18(E)	YoY(%)
Net sales	73,847	85,000	15.1
Operating income	5,678	8,500	49.7
Ordinary income	5,675	7,500	32.2
Net income attributable to owners of parent	3,256	4,400	35.1
Capital investment	7,322	10,000	36.5
Depreciation	3,593	4,000	11.3

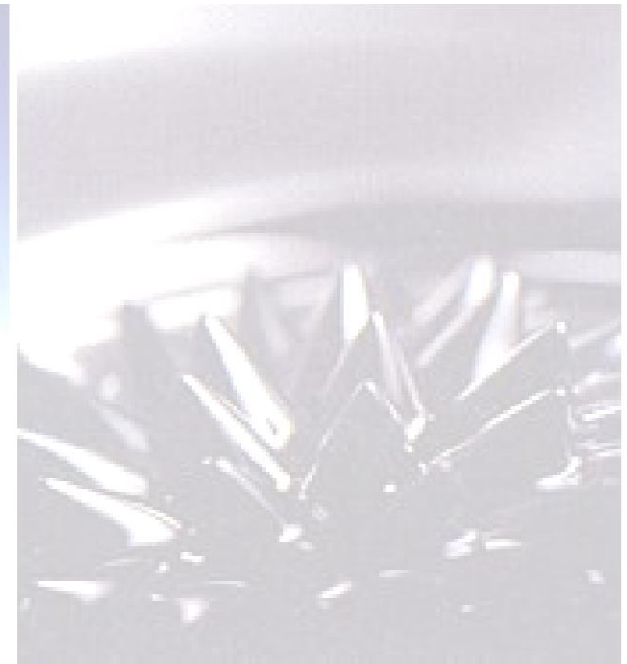
Note: Exchange rate FY3/17⇒FY3/18(assumed rate) : ¥ 109.44→ ¥ 110.00/ US dollar ¥ 16.41 → 16.00 /RMB (Avg. during period)

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

Business forecast (sales by segment)

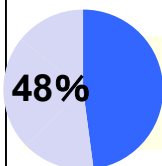


(¥ in millions)	FY3/17	FY3/18(Est.)	YoY(%)
Semiconductor and other equipment-related	32,243	41,694	29.3
Vacuum Feedthroughs	8,160	10,937	34.0
Quartz	8,242	10,700	29.8
Ceramics	6,266	8,075	28.9
CVD-SiC	1,905	3,304	73.4
EB-Gun, LED	3,817	3,772	△ 1.2
Semiconductor wafer	3,854	4,906	27.3
Electronic device	12,627	12,407	△ 1.7
Thermo-electric module	11,747	11,476	△ 2.3
Ferrofluid, others	879	931	5.9
Photovoltaic-related	18,773	18,978	1.1
Quartz crucibles	2,041	1,645	△ 19.4
Solar silicon	10,599	11,755	10.9
PV manufacturing Equip.	967	105	△ 89.1
Solar cell, Others	5,166	5,473	5.9
Others	10,204	11,921	16.8
Total	73,847	85,000	15.1

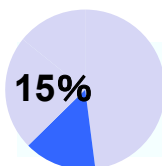


Status by Segment and Outlook

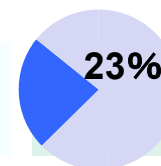
Segment



Semiconductor and other equipment-related



Electronic device



Photovoltaic-related

Vacuum feedthroughs



Quartz



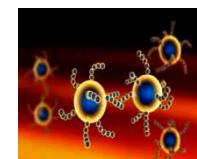
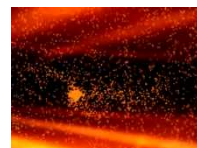
Ceramics



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

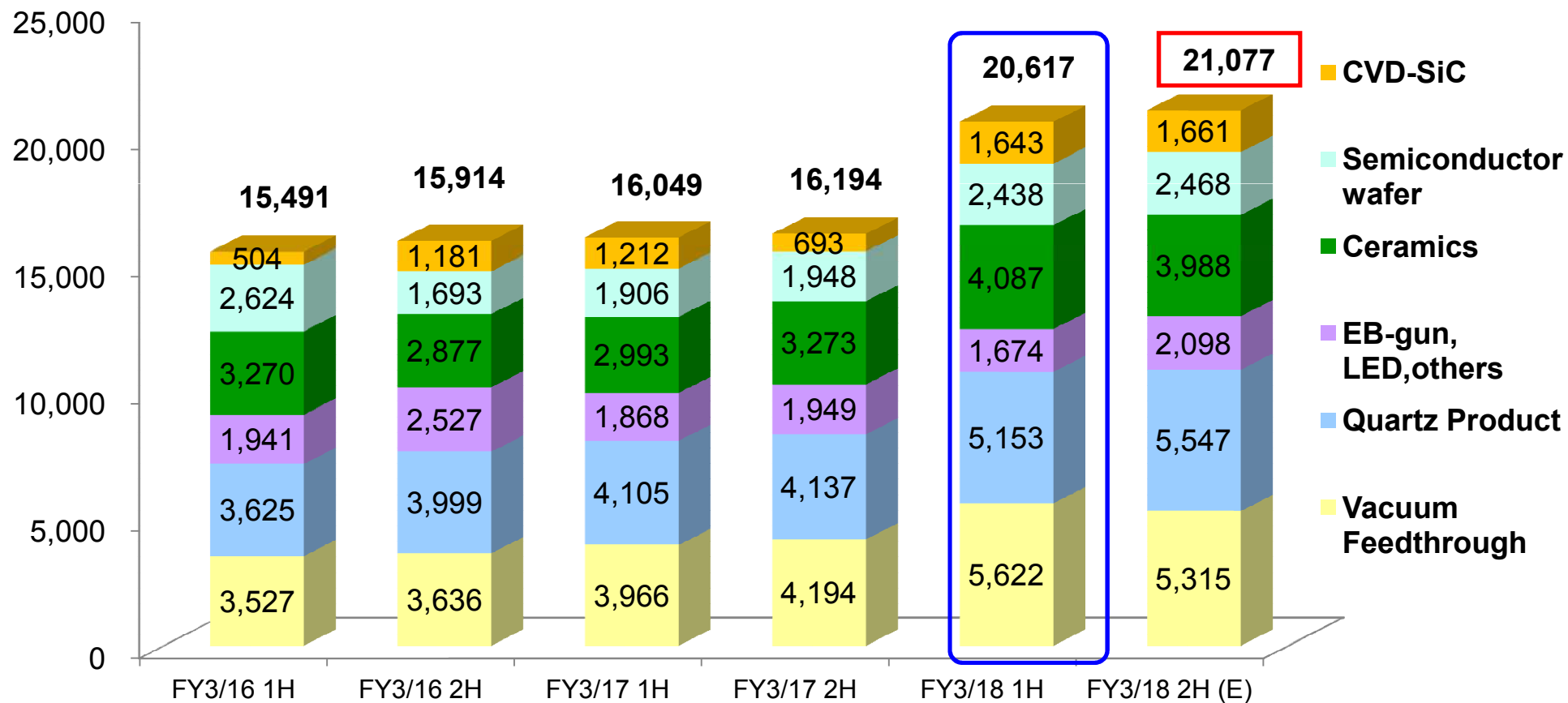


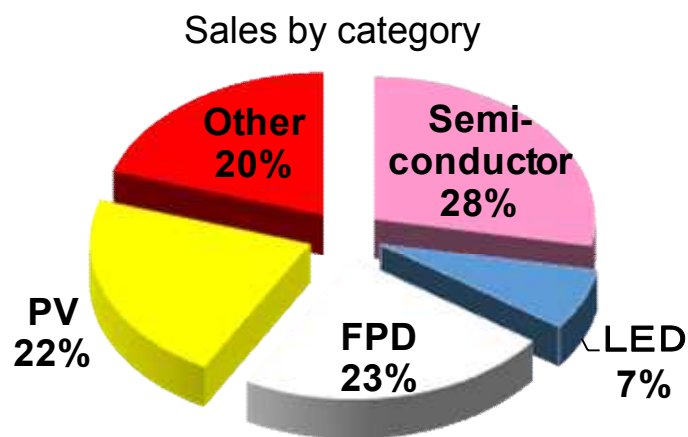
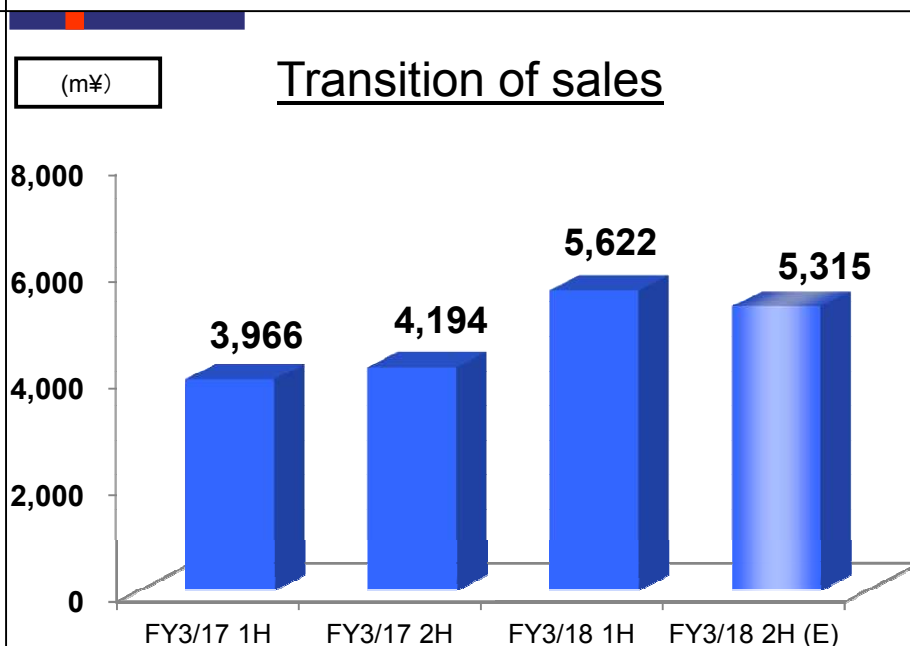
※ The bar chart represents the pct. of each segment in FY3/18 1H sales

Semiconductor and other equipment-related



Sales
(¥ in million)





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

1. Status of 1st half of FY3/18

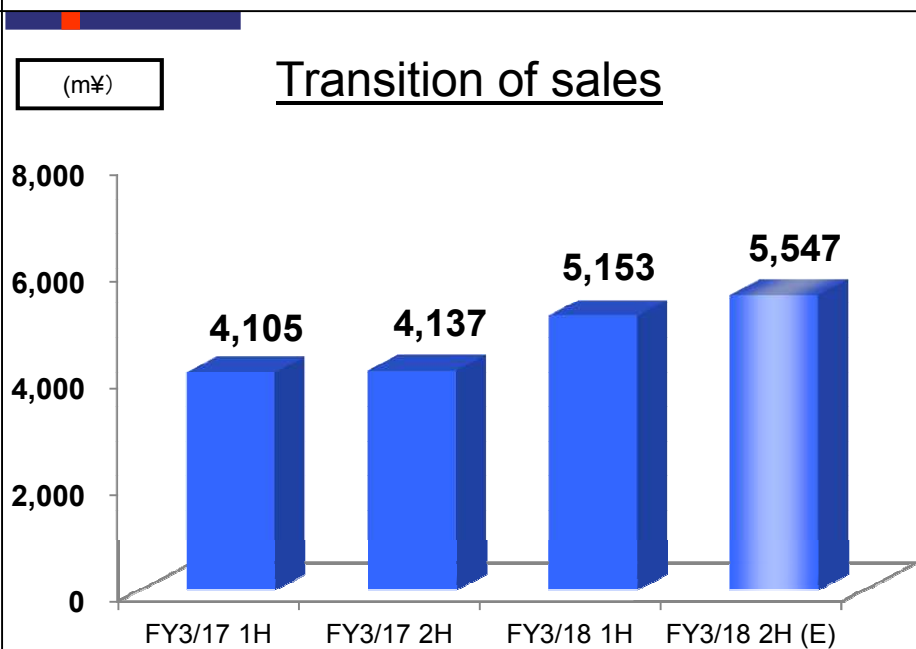
- In the semiconductor market, there was a large volume of investments for 3D-NAND flash memories used at data centers. Therefore, sales of vacuum feedthroughs were strong
- In the FPD market, organic EL investments in Korea and China increased. Higher sales of Ferrotec vacuum feedthroughs used in vacuum processes and of vacuum feedthroughs and dustproof seals used in robots
- In Europe, there was higher demand in the photovoltaic market
- Small increase in contract processing sales because of firm orders

2. Outlook for 2nd half of FY3/18

- More growth in demand involving vacuum process semiconductor manufacturing equipment
- In the FPD market, demand for large LCDs and organic EL displays is expected to remain very strong
- Demand for contract processing is likely to start growing, mainly in China

[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



1. Status of 1st half of FY3/18

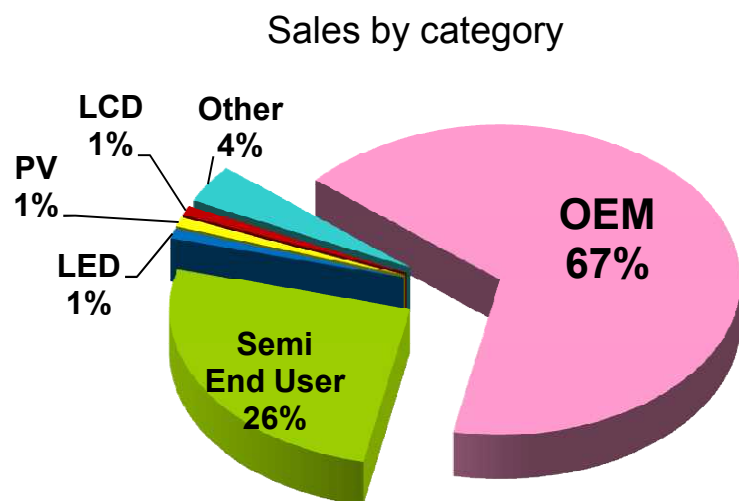
- Sales in the U.S., Japan, and Taiwan were strong supported by strong demand from major OEMs and other end users.
- Sales rose rapidly as demand for quartz consumables for etchers was up, particularly from major U.S. and Japanese OEMs.
- Major Japanese OEMs increased production of next-generation film deposition machinery.
- Continued to add capacity at the Hangzhou (China) plant to meet increasing demand for use in semiconductor manufacturing equipment.
- Commenced delivers of Si parts for etchers to major Japanese OEMs.

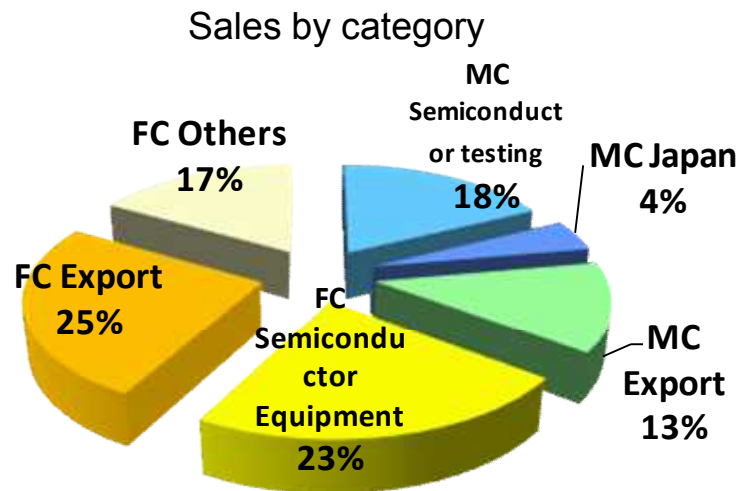
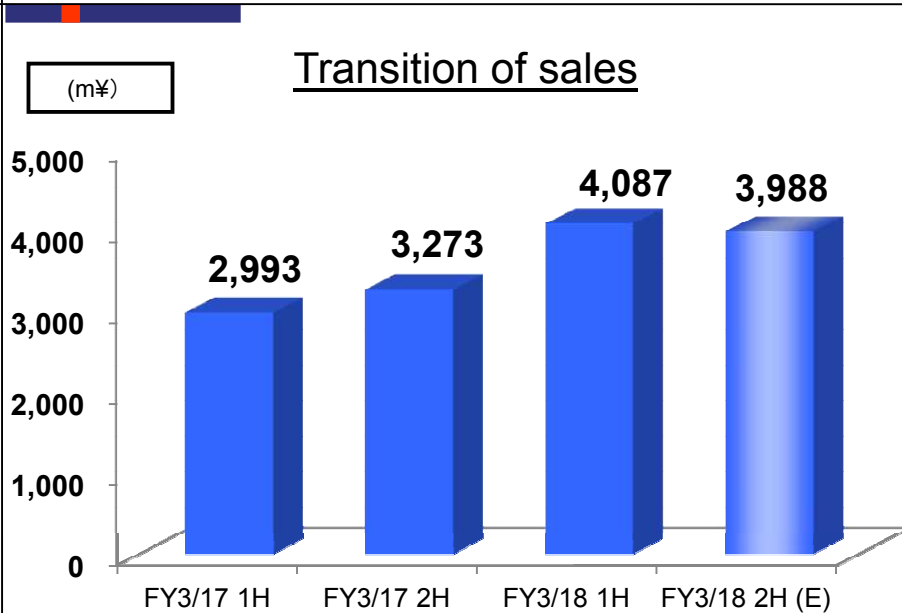
2. Outlook for 2nd half of FY3/18

- Demands for replaceable consumable materials and for quartz parts for 3D-NAND memory are expected to continue to increase, along with rising investment in semiconductor manufacturing equipment in China.
- Start mass production of Si parts for Japanese OEMs

[Measures]

- Increase production capacity at our plant in China (expand the new plant in China and add new equipment) to meet the rapidly rising demand from major OEMs.
- Work more actively on development projects involving next-generation and later-generation devices.





FC (Fine Ceramics) , MC (Machinable Ceramics)

1. Status of 1st half (Jan-Jun) of FY 3/18

Machinable ceramics “Photoveel”

- Strong sales in Japan of test jigs for automotive logic devices
- Started supplying ceramic parts for precision test jigs required by the increasing miniaturization of semiconductor devices
- Strong overseas sales of parts used in medical applications

Fine ceramics

- Big increase in demand in Japan for parts used in semiconductor manufacturing equipment and FPD equipment
- Rapid growth in overseas demand for parts used in etching equipment; work is under way to raise output at the new factory in China

2. Outlook for 2nd half (Jul-Dec) of FY 3/18

Machinable ceramics “Photoveel”

- A recovery in Japan of orders for semiconductor memory test jigs
- Overseas demand for medical equipment parts is expected to be strong in late 2017

Fine ceramics

- Demand continues to grow in Japan for parts used in semiconductor manufacturing equipment and FPD equipment
- Demand continues to grow overseas for parts used in etching equipment

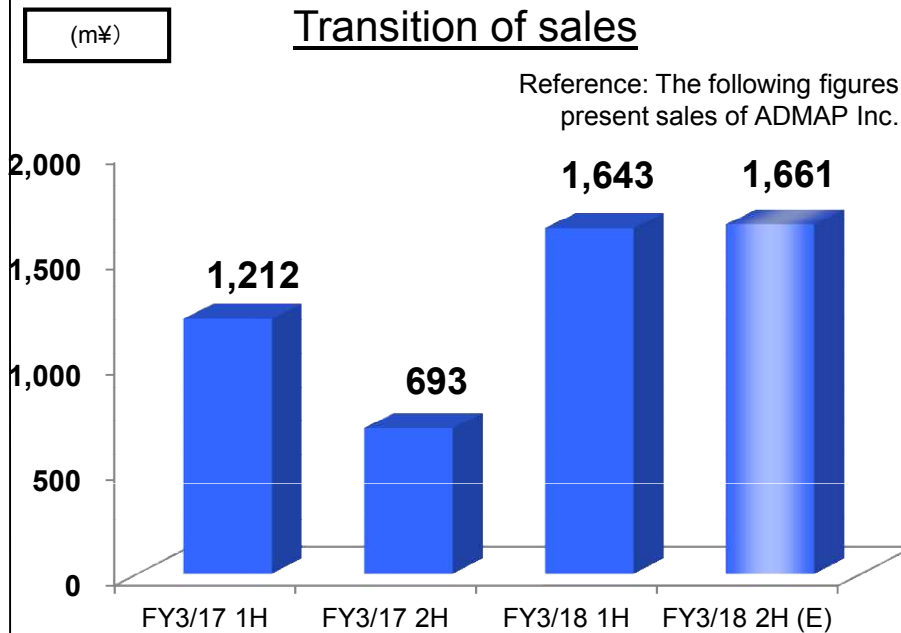
3. Sales policy

Machinable ceramics

- Wafer circuit inspection equipment needs overseas are shifting to new, high-precision jigs; Continue to expand production and sales operations to meet this demand for high-precision products

Fine ceramics

- Customers are asking for more output of parts because of growing demand worldwide for semiconductor manufacturing equipment; the goal is to raise capacity by expanding factories in order to achieve more sales growth



1. Status of 1st half (Jan-Jun) of FY 3/18

- Strong sales of semiconductor manufacturing equipment parts in Japan and overseas
- Started of mass production of new equipment parts contributed to sales growth
- Started mass production of CVD coatings on new large components
- Entry into non-semiconductor fields

2. Outlook for 2nd half (Jul-Dec) of FY 3/18

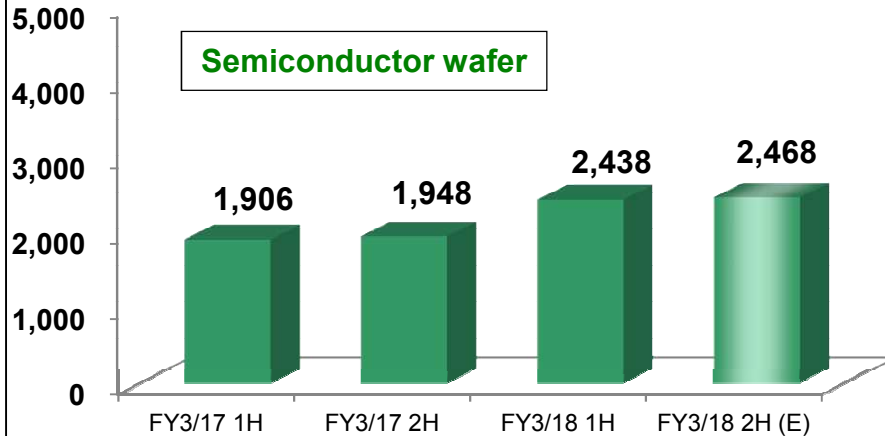
- Foresee strong sales in Japan and overseas of semiconductor manufacturing equipment parts due to new investments in China
- Start mass production of new products due to the success of the aggressive development and fabrication of prototypes of new equipment parts
- Continue to use large-scale facilities to speed up the growth of activities for large components
- Start mass production of niche products to meet highly advanced requirements
- Aggressively enter the non-semiconductor field

[Measures]

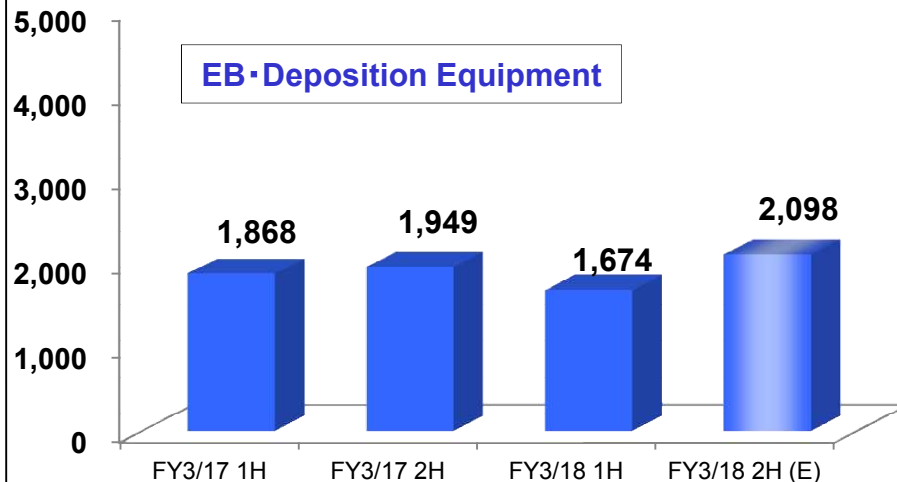
- Establish a production framework capable of meeting the increasing demand for equipment parts at large semiconductor manufacturing equipment suppliers in Japan and overseas
- Establish a production company in Korea and start mass production of semiconductor manufacturing equipment parts
- Continue to aggressively enter the non-semiconductor field
- Reinforce product development and prototype capabilities

Transition of sales

(m¥)



(m¥)



Semiconductor wafer:

1. Status of 1st half of FY3/18

- Market conditions for 6-inch and smaller items have been firm since the beginning of the year and its price is increasing. There is also a trend toward increased production volumes.
- The 8-inch wafer factories in Yinchuan and Shanghai started operating in July 2017

2. Outlook for 2nd half of FY3/18

- Strong orders for 8/6-inch wafers to continue due to solid demand for wafers involving the IoT, sensors, power semiconductors and other market sectors
- Plan to start mass production of an 8-inch wafer of our company in December 2017

[Measures]

- Raise the production yield of 8-inch wafers and increase monthly output capacity to 450,000 units (in 2020)

EB gun and Deposition equipment:

1. Status of 1st half of FY3/18

- Pushed back communication chip investments because of sluggish sales of the current smartphones
- Inquiries received about deposition equipment for compound semiconductors used in next-generation mobilephones

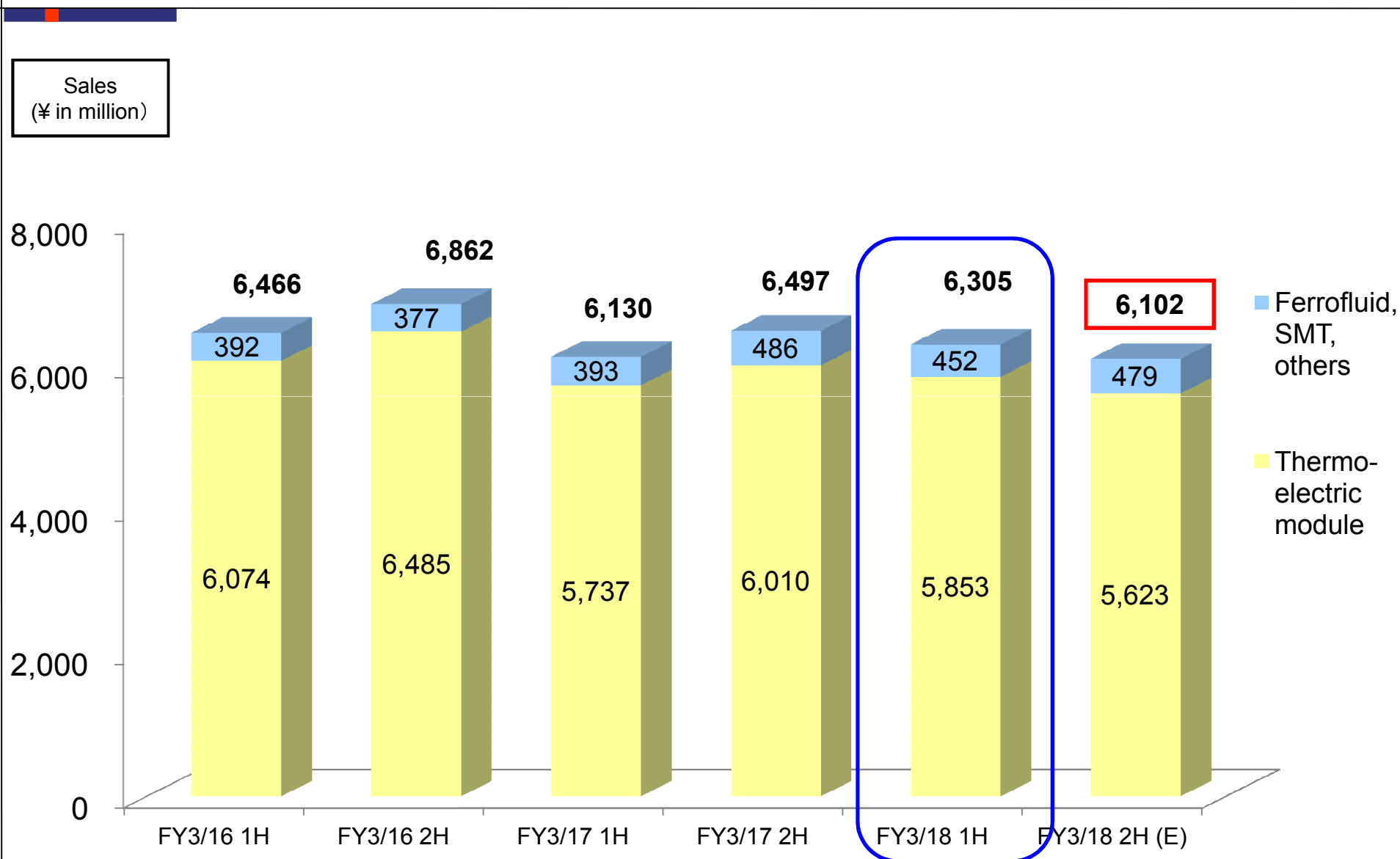
2. Outlook for 2nd half of FY3/18

- Foresee growth in demand for equipment in the communication and filter sectors for IoT applications
- Developing new applications involving base stations for 5G networks

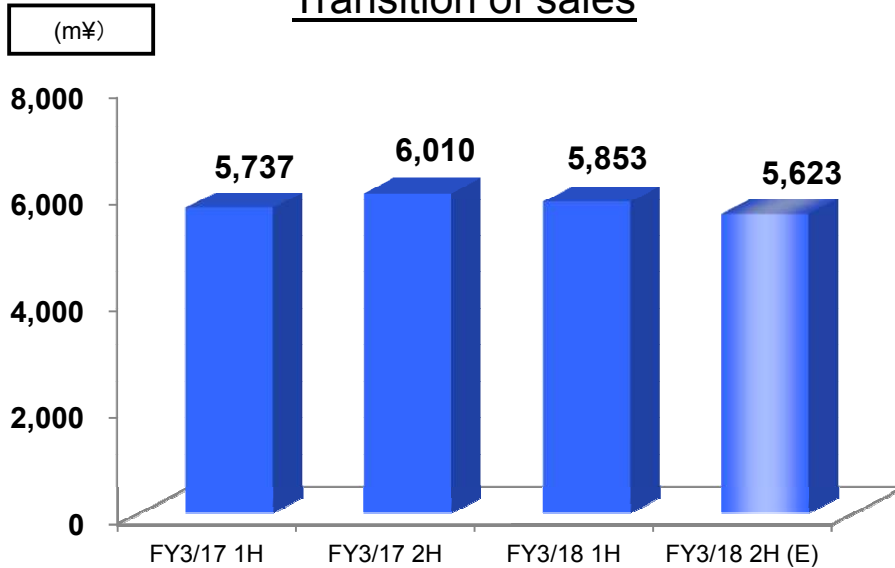
[Measures]

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

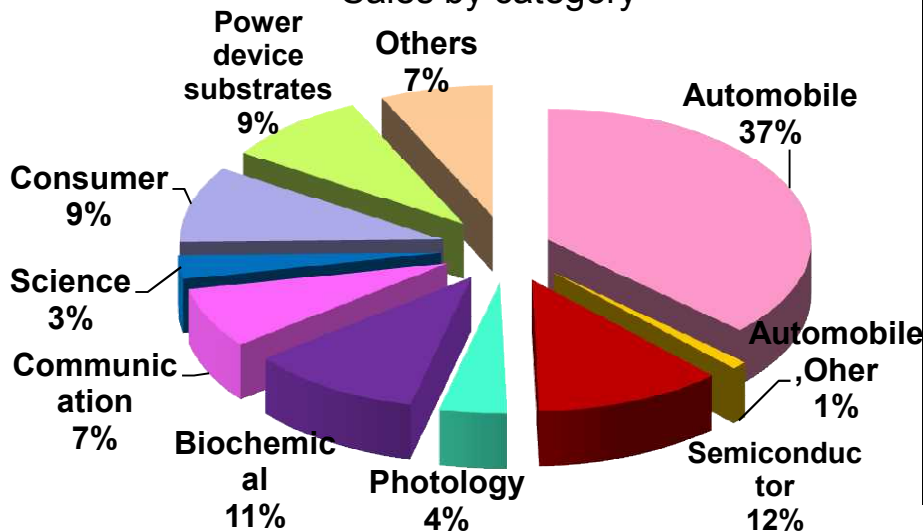
Electronic Device Segment



Transition of sales



Sales by category



1. Status of 1st half of FY3/18

Automobile Seat Application

- Sales of automobile seat application decreased partly because the growth of U.S. automobile sales has peaked out.
- Head-up display sales were unchanged

Other Applications

- Expansion of communications equipment applications for mobile communications systems
- Also growth in temperature management applications for semiconductor manufacturing equipment
- Power semiconductor device substrate sales increased in Europe and Japan

2. Outlook for 2nd half of FY3/18

Automobile Seat Application

- Sales of automobile seat application will probably remain soft despite prospects for higher sales in China
- Strengthen R&D to meet growing demand for other applications in the automotive sector

Other Applications

- More growth expected in demand for devices used in mobile communications systems
- Also anticipate more growth in demand for power semiconductors used in industrial, home and automotive applications

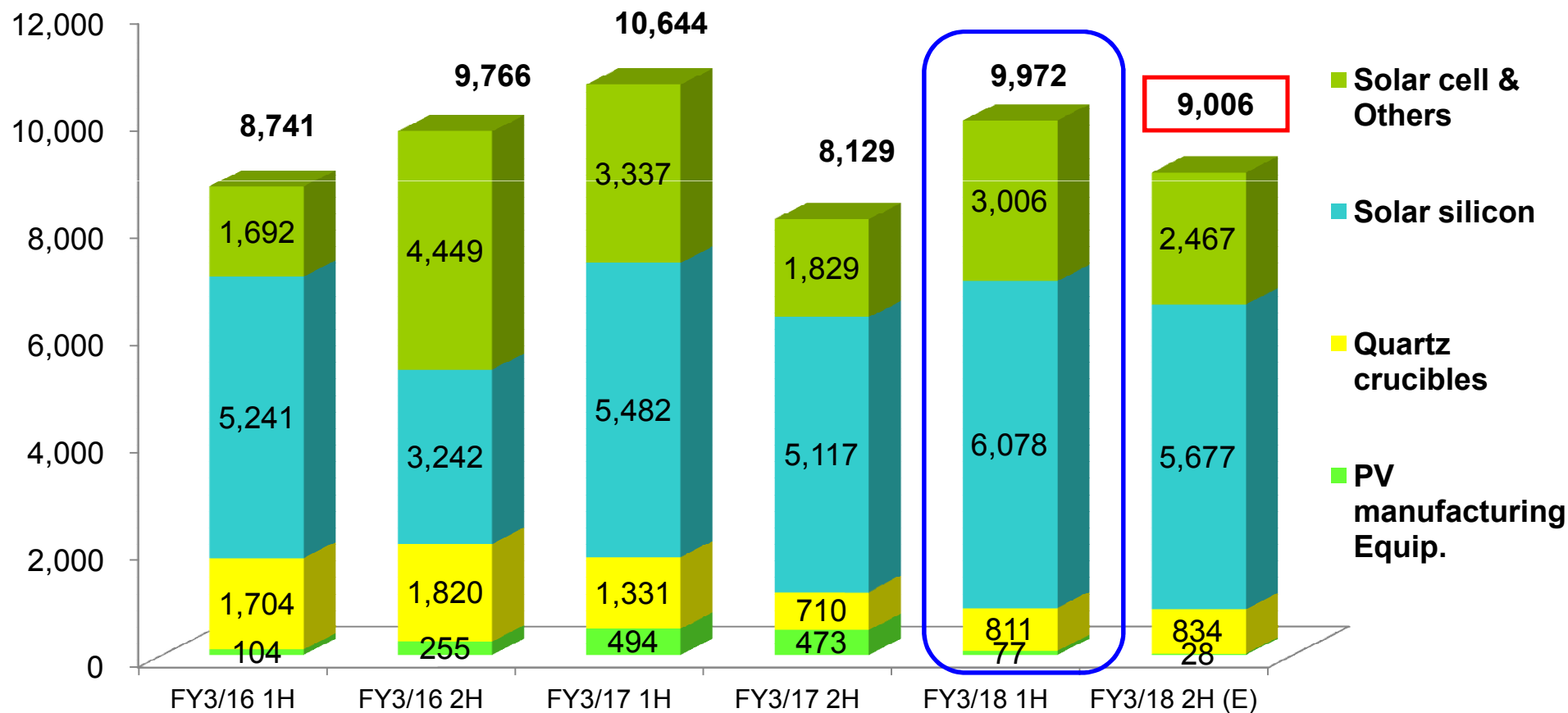
[Measures]

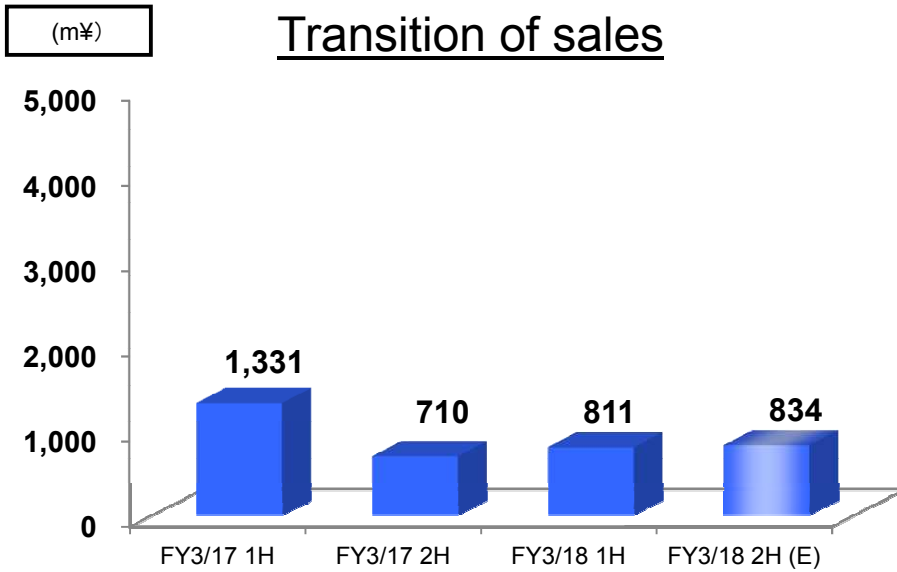
- Increase the number of sub-assembly products and strengthen sales activities (for semiconductors, medical products)
- Add new types of modules and increase the lineup of embedded products
- Continue capital investments for increasing output and using automation
- Continue to make investments for increasing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

Photovoltaic-related Segment



Sales
(¥ in million)





Mono-crystal quartz crucible



Multi-crystal vessel

1. Status of 1st half of FY3/18

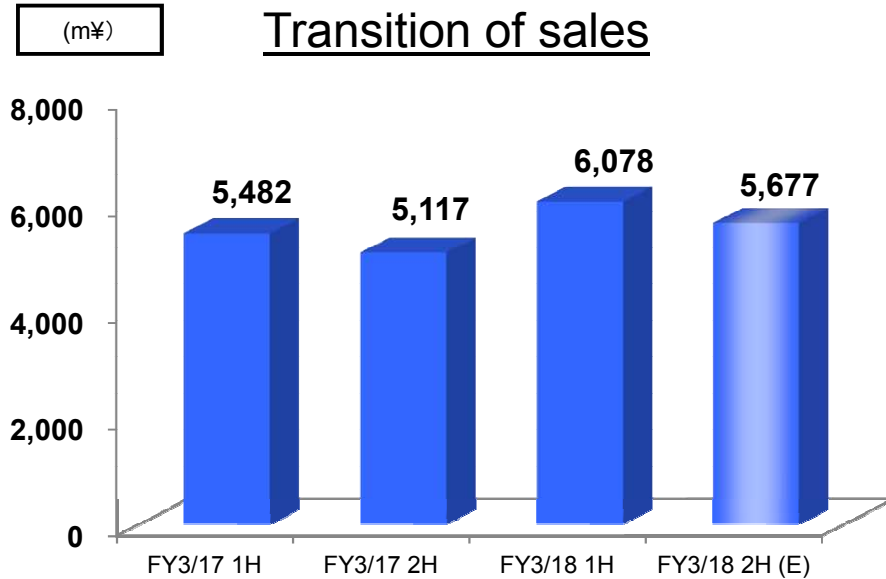
- Although crucible demand remained weak, sales were strong from Q1 due primarily to increasing demand in the semiconductor sector
- Higher demand for small and medium-diameter products resulting from growing demand for semiconductor wafers and higher demand at Chinese manufacturers
- Implemented structural reforms for multi-crystal vessels in response to declining demand

2. Outlook for 2nd half of FY3/18

- More volume growth expected in crucible shipments for mono-crystal crucible for semiconductors because of strong demand for semiconductors
- Continue structural reforms in the unprofitable vessels for solar cell

[Measures]

- Increase sales of semiconductor crucibles by focusing on semiconductor applications
- Increase output of medium-diameter (22 to 24 inch (200mm)) semiconductor crucibles
- Aiming to develop a 32-inch crucible in the future



Mono-crystal ingot



Multi-crystal ingot



PV wafer

1. Status of 1st half of FY3/18

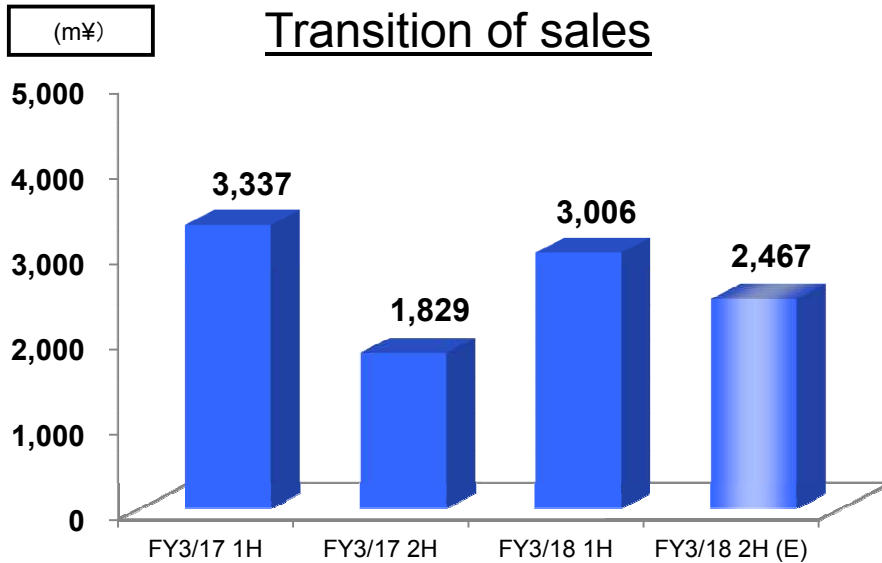
- Solid sales of mono-crystal wafers to new OEM clients
- Growth of solar power additions in China, India and other emerging countries was larger than forecast (42.3GW in China for Jan-Sep 2017, an annual rate of about 50GW)
- Market prices had been decreasing slowly, mainly for multi-crystal vessels, but prices started recovering gradually around April

2. Outlook for 2nd half of FY3/18

- Continue to aim for profitability by achieving sufficient capacity utilization, chiefly for N-type mono-crystal wafers
- Worldwide new solar power in 2017 is estimated at about 100GW, 25% more than in 2016; but prices started declining in July, mostly for mono-crystal products, because of a temporary downturn in demand in China and India
- As of October, polysilicon prices were moving up due to tighter environmental restrictions in China but wafer prices were declining

[Measures]

- Further pursue process of thinner wire technology with fixed abrasive grains
- Improve the performance of N-type mono-crystals to meet customers' demands
- Focus on products with substantial added value



Solar cell

1. Status of 1st half of FY3/17

- Secure profits with high conversion efficiency mono-crystal cells utilizing PERC technology
- Significant volumes of orders in emerging countries, mainly China and India

2. Outlook for 2nd half of FY3/17

- For solar cells, in response to the declining prices of both mono-crystal and multi-crystal products, increase orders for mono-crystal products using PERC technology
- Taking actions to remain price competitive by raising conversion efficiency in response to increasingly heated competition in the mono-crystal solar cell market

[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









Reference Materials

Company profile

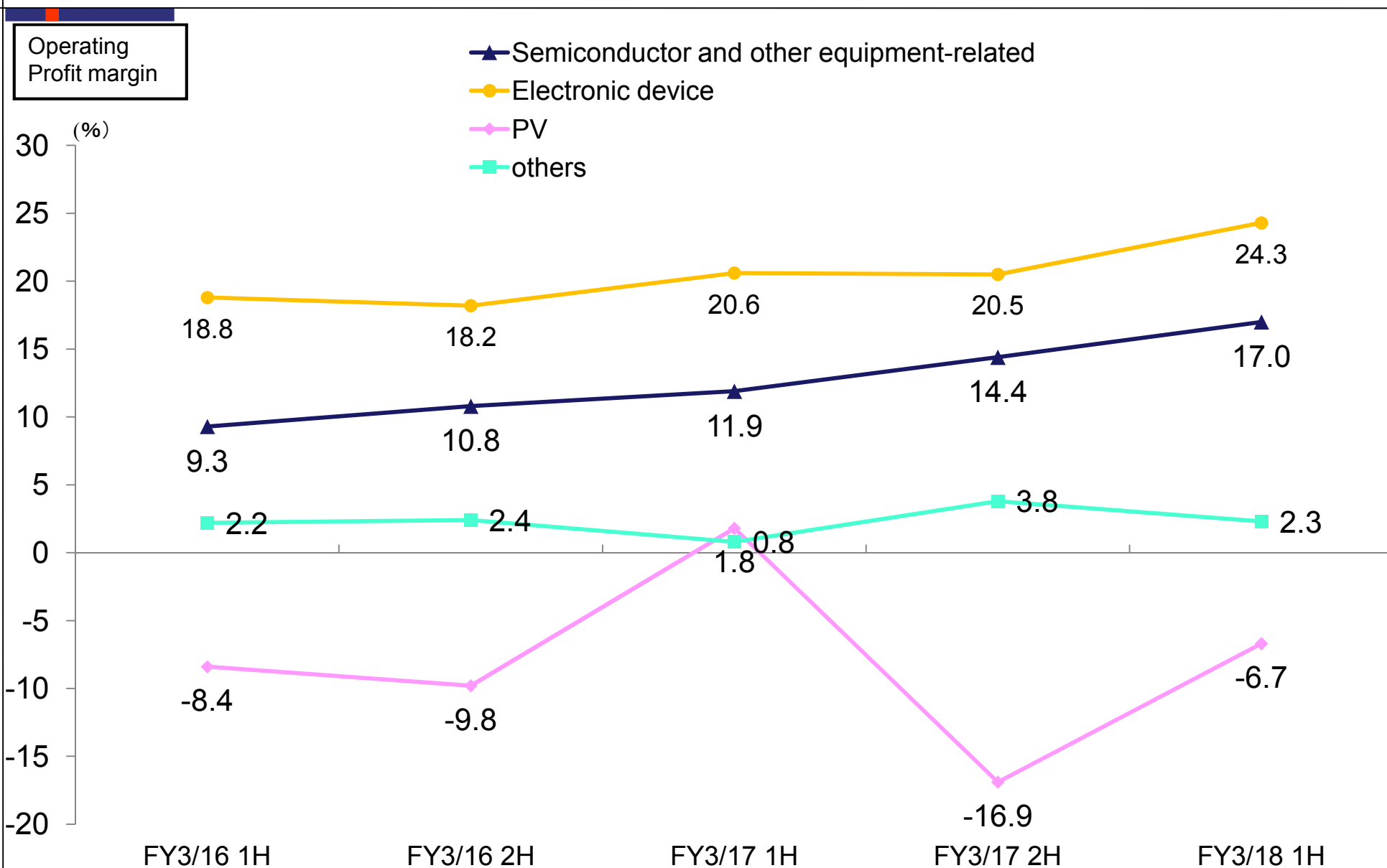


Corporate Name	Ferrotec Holdings Corporation
Date of Foundation	September 27, 1980
Address	Nihonbashi Plaza Building, 2-3-4, Nihonbashi, Chuo-ku, Tokyo Japan
Listed	JASDAQ (Listed Code: 6890)
President	Akira Yamamura
Business Segment	Business management, R&D operations of group companies
Capital	17,572,000,000 JPY
Issued Stock	37,002,202 shares
Related Company	[34 Consolidated Subsidiary] [6 Companies Accounted for by the Equity Method]
Employees	[Consolidated] 6,536 [Non-consolidated] 69

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	Establishing operations in other countries	Building a new profit structure
<p>~ Ferrotec's core Technology ~</p>	<p>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</p>	<p>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</p>

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 1st half Plan(revised on Aug. 14) vs. Results)



¥ in millions	FY3/18 1H Plan		FY3/18 1H Results			
	Amount	Pct. Of Sales(%)	Amount	Pct. Of Sales(%)	Amount	Pct(%)
Semiconductor and other equipment-related	20,350	48.5	20,617	48.0	267	1.3
Vacuum Feedthroughs	4,900	11.7	5,622	13.1	722	14.7
Quartz	5,450	13.0	5,153	12.0	△ 297	△ 5.4
Ceramics	4,100	9.8	4,087	9.5	△ 13	△ 0.3
CVD-SiC	1,550	3.7	1,643	3.8	93	6.0
EB-Gun, LED	2,150	5.1	1,674	3.9	△ 476	△ 22.1
Semiconductor wafer	2,200	5.2	2,438	5.7	238	10.8
Electronic device	6,900	16.4	6,305	14.7	△ 595	△ 8.6
Thermo-electric module	6,400	15.2	5,853	13.6	△ 547	△ 8.5
Ferrofluid, Others	500	1.2	452	1.1	△ 48	△ 9.6
Photovoltaic-related	7,700	18.3	9,971	23.2	2,271	29.5
Quartz crucibles	850	2.0	811	1.9	△ 39	△ 4.6
Solar silicon	4,500	10.7	6,078	14.1	1,578	35.1
PV manufacturing Eupip.	50	0.1	77	0.2	27	54.0
Solar cell, Others	2,300	5.5	3,006	7.0	706	30.7
Others	7,050	16.8	6,090	14.2	△ 960	△ 13.6
Total	42,000	100.0	42,983	100.0	983	2.3
Gross income	11,890	28.3	12,293	28.6	403	3.4
SG&A expenses	7,490	17.8	7,795	18.1	305	4.1
Operating income	4,400	10.5	4,498	10.5	98	2.2
Ordinary income	3,700	8.8	3,857	9.0	157	4.2
Net income	2,100	5.0	2,299	5.3	199	9.5

※Net income=Net income attributable to owners of parent

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



¥ in millions	FY3/18 1H		FY3/18 2H			
	Amount	Pct. Of Sales(%)	Amount	Pct. Of Sales(%)	Amount	Pct(%)
Semiconductor and other equipment-related	20,617	48.0	21,077	50.2	460	2.2
Vacuum Feedthroughs	5,622	13.1	5,315	12.6	△ 307	△ 5.5
Quartz	5,153	12.0	5,547	13.2	394	7.6
Ceramics	4,087	9.5	3,988	9.5	△ 99	△ 2.4
CVD-SiC	1,643	3.8	1,661	4.0	18	1.1
EB-Gun, LED	1,674	3.9	2,098	5.0	424	25.3
Semiconductor wafer	2,438	5.7	2,468	5.9	30	1.2
Electronic device	6,305	14.7	6,102	14.5	△ 203	△ 3.2
Thermo-electric module	5,853	13.6	5,623	13.4	△ 230	△ 3.9
Ferrofluid, Others	452	1.1	479	1.1	27	6.0
Photovoltaic-related	9,971	23.2	9,006	21.4	△ 965	△ 9.7
Quartz crucibles	811	1.9	834	2.0	23	2.8
Solar silicon	6,078	14.1	5,677	13.5	△ 401	△ 6.6
PV manufacturing Epuip.	77	0.2	28	0.1	△ 49	△ 63.6
Solar cell, Others	3,006	7.0	2,467	5.9	△ 539	△ 17.9
Others	6,090	14.2	5,831	13.9	△ 259	△ 4.3
Total	42,983	100.0	42,016	100.0	△ 967	△ 2.2
Gross income	12,293	28.6	11,606	27.6	△ 687	△ 5.6
SG&A expenses	7,795	18.1	7,604	18.1	△ 191	△ 2.5
Operating income	4,498	10.5	4,002	9.5	△ 496	△ 11.0
Ordinary income	3,857	9.0	3,643	8.7	△ 214	△ 5.5
Net income	2,299	5.3	2,101	5.0	△ 198	△ 8.6

*Some figures are rounded.

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



¥ in millions	FY3/17 Results		FY3/18 Initial Plan			
	Amount	Pct. Of Sales(%)	Amount	Pct. Of Sales(%)	Amount	Pct. change(%)
Semiconductor and other equipment-related	32,243	43.7	41,250	49.7	9,007	27.9
Vacuum Feedthroughs	8,160	11.0	9,300	11.2	1,140	14.0
Quartz	8,242	11.2	11,450	13.8	3,208	38.9
Ceramics	6,266	8.5	8,050	9.7	1,784	28.5
CVD-SiC	1,905	2.6	3,300	4.0	1,395	73.2
EB-Gun, LED	3,817	5.2	4,750	5.7	933	24.4
Semiconductor wafer	3,854	5.2	4,400	5.3	546	14.2
Electronic device	12,627	17.1	13,450	16.2	823	6.5
Thermo-electric module	11,747	15.9	12,450	15.0	703	6.0
Ferrofluid, others	879	1.2	1000	1.2	121	13.8
Photovoltaic-related	18,773	25.4	15,000	18.1	Δ 3,773	Δ 20.1
Quartz crucibles	2,041	2.8	1,950	2.3	Δ 91	Δ 4.5
Solar silicon	10,599	14.4	8,500	10.2	Δ 2,099	Δ 19.8
PV manufacturing Epuip.	967	1.3	50	0.1	Δ 917	Δ 94.8
Solar cell, Others	5,166	7.0	4,500	5.4	Δ 666	Δ 12.9
Others	10,204	13.8	13,300	16.0	3,096	30.3
Total	73,847	100.0	83,000	100.0	9,153	12.4

Gross income	19,708	26.7	23,190	27.9	3,482	17.7
SG&A expenses	14,031	19.0	14,990	18.1	959	6.8
Operating income	5,678	7.7	8,200	9.9	2,522	44.4
Ordinary income	5,675	7.7	7,100	8.6	1,425	25.1
Net income	3,256	4.4	4,200	5.1	944	29.0
Capital Investment	7,322	-	10,000	-	2,678	36.6
Depreciation	3,593	-	4,000	-	407	11.3

*Some figures are rounded.

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



¥ in millions	FY3/17 Results		FY3/18 Revised Plan			
	Amount	Pct. Of Sales(%)	Amount	Pct. Of Sales(%)	Amount	Pct(%)
Semiconductor and other equipment-related	32,243	43.7	41,694	49.1	9,451	29.3
Vacuum Feedthroughs	8,160	11.0	10,937	12.9	2,777	34.0
Quartz	8,242	11.2	10,700	12.6	2,458	29.8
Ceramics	6,266	8.5	8,075	9.5	1,809	28.9
CVD-SiC	1,905	2.6	3,304	3.9	1,399	73.4
EB-Gun, LED	3,817	5.2	3,772	4.4	△ 45	△ 1.2
Semiconductor wafer	3,854	5.2	4,906	5.8	1,052	27.3
Electronic device	12,627	17.1	12,407	14.6	△ 220	△ 1.7
Thermo-electric module	11,747	15.9	11,476	13.5	△ 271	△ 2.3
Ferrofluid, Others	879	1.2	931	1.1	52	5.9
Photovoltaic-related	18,773	25.4	18,978	22.3	205	1.1
Quartz crucibles	2,041	2.8	1,645	1.9	△ 396	△ 19.4
Solar silicon	10,599	14.4	11,755	13.8	1,156	10.9
PV manufacturing Equip.	967	1.3	105	0.1	△ 862	△ 89.1
Solar cell, Others	5,166	7.0	5,473	6.4	307	5.9
Others	10,204	13.8	11,921	14.0	1,717	16.8
Total	73,847	100.0	85,000	100.0	11,153	15.1

Gross income	19,708	26.7	23,900	28.1	4,192	21.3
SG&A expenses	14,031	19.0	15,400	18.1	1,369	9.8
Operating income	5,678	7.7	8,500	10.0	2,822	49.7
Ordinary income	5,675	7.7	7,500	8.8	1,825	32.2
Net income	3,256	4.4	4,400	5.2	1,144	35.1
Capital Investment	7,322	-	10,000	-	2,678	36.6
Depreciation	3,593	-	4,000	-	407	11.3

*Some figures are rounded.

Business performance (FY3/17 1st half vs. FY3/18 1st half)



¥ in millions	FY3/17H Results		FY3/18 1H Results			
	Amount	Pct. Of Sales(%)	Amount	Pct. Of Sales(%)	Amount	Pct(%)
Semiconductor and other equipment-related	16,049	42.6	20,617	48.0	4,568	28.5
Vacuum Feedthroughs	3,966	10.5	5,622	13.1	1,656	41.8
Quartz	4,105	10.9	5,153	12.0	1,048	25.5
Ceramics	2,993	7.9	4,087	9.5	1,094	36.6
CVD-SiC	1,212	3.2	1,643	3.8	431	35.6
EB-Gun, LED	1,868	5.0	1,674	3.9	△ 194	△ 10.4
Semiconductor wafer	1,906	5.1	2,438	5.7	532	27.9
Electronic device	6,130	16.3	6,305	14.7	175	2.9
Thermo-electric module	5,737	15.2	5,853	13.6	116	2.0
Ferrofluid, Others	393	1.0	452	1.1	59	15.0
Photovoltaic-related	10,644	28.3	9,971	23.2	△ 673	△ 6.3
Quartz crucibles	1,331	3.5	811	1.9	△ 520	△ 39.1
Solar silicon	5,482	14.6	6,078	14.1	596	10.9
PV manufacturing Equip.	494	1.3	77	0.2	△ 417	△ 84.4
Solar cell, Others	3,337	8.9	3,006	7.0	△ 331	△ 9.9
Others	4,826	12.8	6,090	14.2	1,264	26.2
Total	37,650	100.0	42,983	100.0	5,333	14.2

Gross income	10,094	26.8	12,293	28.6	2,199	21.8
SG&A expenses	6,717	17.8	7,795	18.1	1,078	16.0
Operating income	3,376	9.0	4,498	10.5	1,122	33.2
Ordinary income	2,107	5.6	3,857	9.0	1,750	83.1
Net income	1,033	2.7	2,299	5.3	1,266	122.6

*Some figures are rounded.