

## **Ferrotec Corporation**

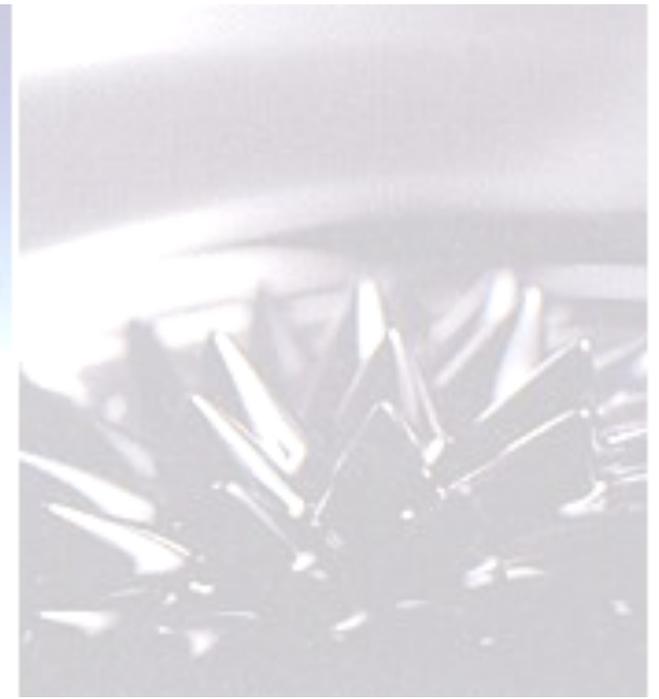
Results for the fiscal year ended March 31, 2016

May 25, 2016

( 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, 2016 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 25, 2016. 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 2016 Financial Results

# Financial highlights



| ¥ in millions                                      | FY3/15 |                  | FY3/16 |                  | YoY     |                |
|--|--------|------------------|--------|------------------|---------|----------------|
|  | Amount | Pct. of sales(%) | Amount | Pct. of sales(%) | Amount  | Pct. Change(%) |
| <b>Net sales</b>                                   | 59,078 | 100.0            | 69,463 | 100.0            | 10,385  | 17.6           |
| Cost of sales                                      | 45,594 | 77.2             | 52,149 | 75.1             | 6,555   | 14.4           |
| <b>Gross income</b>                                | 13,484 | 22.8             | 17,313 | 24.9             | 3,829   | 28.4           |
| SG&A expenses                                      | 11,813 | 20.0             | 13,289 | 19.1             | 1,476   | 12.5           |
| <b>Operating income</b>                            | 1,671  | 2.8              | 4,024  | 5.8              | 2,353   | 140.8          |
| Non-operating income                               | 1,334  | 2.3              | 664    | 1.0              | △ 670   | △ 50.2         |
| Non-operating expense                              | 974    | 1.6              | 867    | 1.2              | △ 107   | △ 11.0         |
| <b>Ordinary income</b>                             | 2,030  | 3.4              | 3,822  | 5.5              | 1,792   | 88.3           |
| Extraordinary income                               | 7      | 0.0              | 33     | 0.0              | 26      | 371.4          |
| Extraordinary loss                                 | 3,362  | 5.7              | 499    | 0.7              | △ 2,863 | △ 85.2         |
| <b>Net income attributable to owners of parent</b> | △2,132 | -                | 2,162  | 3.1              | 4,294   | -              |
| <b>Capital Investment</b>                          | 3,375  | -                | 3,440  | -                | 65      | 1.9            |
| <b>Depreciation</b>                                | 3,964  | -                | 4,303  | -                | 339     | 8.6            |

# Financial highlights



| ¥ in millions                               | FY3/16 |                  |
|---|--------|------------------|
|   | Amount | Pct. of sales(%) |
| Net sales                                   | 69,463 | 100.0            |
| Cost of sales                               | 52,149 | 75.1             |
| Gross income                                | 17,313 | 24.9             |
| SG&A expenses                               | 13,289 | 19.1             |
| Operating income                            | 4,024  | 5.8              |
| Non-operating income                        | 664    | 1.0              |
| Non-operating expense                       | 867    | 1.2              |
| Ordinary income                             | 3,822  | 5.5              |
| Extraordinary income                        | 33     | 0.0              |
| Extraordinary loss                          | 499    | 0.7              |
| Income before income tax                    | 3,356  | 4.8              |
| Corporate tax, etc.                         | 1,266  | 1.8              |
| Net income attributable to owners of parent | 2,162  | 3.1              |

The cost of sales ratio decreased 2.1 points because of higher sales in the equipment-related business and electronic device business

Up ¥254 million excluding the effects of foreign exchange but down 0.9 point as a pct. of sales

Equity-accounted investment income : ¥ 142 million  
Exchange gain : ¥236 million

Impairment loss in:  
Photovoltaic-related business : ¥295 million  
Other business : ¥120 million

# Segment Sales and Operating income



| Net sales<br>(¥ in millions) | FY3/15        |                  | FY3/16        |                  | YOY           |                |
|------------------------------|---------------|------------------|---------------|------------------|---------------|----------------|
|                              | Amount        | Pct. Of Sales(%) | Amount        | Pct. Of Sales(%) | Amount        | Pct. change(%) |
| Equipment-related            | 26,566        | 45.0             | 31,405        | 45.2             | 4,839         | 18.2           |
| Electronic device            | 9,679         | 16.4             | 13,328        | 19.2             | 3,649         | 37.7           |
| Photovoltaic-related         | 17,948        | 30.4             | 18,505        | 26.6             | 557           | 3.1            |
| Others                       | 4,884         | 8.3              | 6,224         | 9.0              | 1,340         | 27.4           |
| <b>Total</b>                 | <b>59,078</b> | <b>100.0</b>     | <b>69,463</b> | <b>100.0</b>     | <b>10,385</b> | <b>17.6</b>    |

| Operating income<br>(¥ in millions) | FY3/15       |                  | FY3/16       |                  | 前期比          |                |
|-------------------------------------|--------------|------------------|--------------|------------------|--------------|----------------|
|                                     | Amount       | Pct. Of Sales(%) | Amount       | Pct. Of Sales(%) | Amount       | Pct. change(%) |
| Equipment-related                   | 1,523        | 5.7              | 3,148        | 10.0             | 1,625        | 106.7          |
| Electronic device                   | 1,459        | 15.1             | 2,467        | 18.5             | 1,008        | 69.1           |
| Photovoltaic-related                | △1,272       | -                | △1,692       | -                | △ 420        | -              |
| Others                              | 10           | 0.2              | 143          | 2.3              | 133          | 1,330.0        |
| Corporate & elimination             | △50          | -                | △42          | -                | 8            | -              |
| <b>Total</b>                        | <b>1,671</b> | <b>2.8</b>       | <b>4,024</b> | <b>5.8</b>       | <b>2,353</b> | <b>140.8</b>   |

# Consolidated Balance Sheet ~ Assets ~



| (¥ in millions)                | FY3/15        | FY3/16        | Difference |
|--------------------------------|---------------|---------------|------------|
| <b>Current assets</b>          | <b>44,418</b> | <b>45,284</b> | 866        |
| Cash & deposits                | 10,517        | 10,038        | △ 479      |
| Note & accounts receivable     | 16,971        | 17,745        | 774        |
| Inventory                      | 14,135        | 14,442        | 307        |
| <b>Fixed assets</b>            | <b>34,992</b> | <b>33,484</b> | △ 1,508    |
| <b>Tangible fixed assets</b>   | <b>27,739</b> | <b>26,044</b> | △ 1,695    |
| Building                       | 7,287         | 6,695         | △ 592      |
| Equipment & machinery          | 9,995         | 9,575         | △ 420      |
| Tools, furniture, and fixture  | 6,394         | 6,103         | △ 291      |
| Land                           | 638           | 631           | △ 7        |
| <b>Intangible fixed assets</b> | <b>1,875</b>  | <b>2,062</b>  | 187        |
| Goodwill                       | 530           | 668           | 138        |
| Investments & other assets     | 5,377         | 5,377         | 0          |
| <b>Total assets</b>            | <b>79,410</b> | <b>78,769</b> | △ 641      |

**[Major factors for increase in current assets]**

Increase in current assets thanks to higher notes and accounts receivable, as a result of the acquisition of ADMAP

**[Major factors for decrease in tangible fixed assets]**

Purchases of tangible fixed assets were ¥3,440 million (cash flow basis) and depreciation was ¥4,303 million; also affected by impairment and sales of other equipment

**[Intangible fixed assets]**

Goodwill on acquisition of ADMAP : ¥ 295 million  
Amortization of goodwill : ¥155 million

# Consolidated Balance Sheet ~Liabilities and Net assets~



| (¥ in millions)                                     | FY3/15        | FY3/16        | Difference   |
|---|---------------|---------------|--------------|
| Current liabilities                                 | 31,535        | 29,351        | △ 2,184      |
| Notes and accounts payable                          | 13,241        | 10,996        | △ 2,245      |
| Short-term debt                                     | 8,352         | 6,922         | △ 1,430      |
| Current portion of long-term borrowings             | 3,321         | 3,386         | 65           |
| Fixed liabilities                                   | 8,443         | 9,929         | 1,486        |
| Long-term debt                                      | 5,239         | 6,399         | 1,160        |
| <b>Total liabilities</b>                            | <b>39,979</b> | <b>39,280</b> | <b>△ 699</b> |
| Net Assets  | 39,431        | 39,488        | 57           |
| Shareholder's equity                                | 28,286        | 30,199        | 1,913        |
| Total adjustment                                    | 10,559        | 8,484         | △ 2,075      |
| Non-controlling interests                           | 575           | 780           | 205          |
| <b>Total liabilities &amp; shareholder's equity</b> | <b>79,410</b> | <b>78,769</b> | <b>△ 641</b> |

## [Major factors for decrease in current liabilities]

Mainly because of a ¥1,800 million decline in payables for materials sold to a company used for outsourced production, as a result of a production adjustments by OEM producer of photovoltaic wafers

## [Interest-being debt]

Short-term debt + Current portion of long-term borrowings      ¥10,308 million ( 11,673 )

Long-term debt + bond etc.      ¥6,399 million ( 5,239 )

**Total**      **¥16,707 million ( 16,912 )**

**[ Net interest-being debt ¥6,669 million ( 6,395 ) ]**

\*Parentheses represent the figures as of end-FY3/15

## [Net assets]

### Major factors :

Net income      :      ¥2,162 million

Dividends      :      △ ¥246 million

Foreign currency translation adjustments  
:      △¥1,969 million

※Net income=Net income attributable to owners of parent

# Consolidated Cash Flow



| (¥ in millions)  | FY3/15        | FY3/16        |
|--|---------------|---------------|
| <b>Cash flow from operating activities</b>   | <b>7,829</b>  | <b>4,642</b>  |
| Income before income taxes   | △1,324        | 3,356         |
| Depreciation   | 3,964         | 4,303         |
| Exchange gain & loss (△: gain)   | △273          | 239           |
| Changes in notes & accounts receivable (△: increase)   | 1,569         | △1,042        |
| Changes in inventories (△: increase)   | △469          | △478          |
| Changes in accounts payable (△: decrease)  | 773           | △2,340        |
| Others   | 3,589         | 604           |
| <b>Cash flow from investing activities</b>   | <b>△3,552</b> | <b>△4,023</b> |
| Payments for purchase of tangible fixed assets   | △3,375        | △3,440        |
| Proceeds from sales of tangible fixed assets   | 368           | 204           |
| Payments for purchase of marketable securities   | △192          | △21           |
| Payments for purchase of shares of subsidiaries accompanying changes in the scope of consolidation | -             | △221          |
| Others   | △353          | △545          |
| <b>Cash flow from financing activities</b>   | <b>△2,111</b> | <b>△520</b>   |
| Changes in short-term borrowing  | △1,658        | △1,398        |
| Proceeds from long-term debt   | 2,872         | 4,989         |
| Payments of long-term debt   | △3,075        | △3,755        |
| Payments for dividend  | △185          | △248          |
| Others   | △65           | △108          |
| <b>Changes in cash &amp; cash equivalents</b>  | <b>2,966</b>  | <b>△479</b>   |
| <b>Cash and cash equivalents, beginning of year</b>  | <b>7,550</b>  | <b>10,517</b> |
| <b>Cash and cash equivalents, end of year</b>  | <b>10,517</b> | <b>10,038</b> |

| [ Operating cash flow]  |
|---|
| Income before income tax + Depreciation                                 |
| <b>¥7,659 million</b>   |
| Decrease in operating CF due to increase in notes & accounts receivable |
| <b>△¥1,042 million</b>  |
| Increase in operating CF due to decrease in accounts payable            |
| <b>△¥2,340 million</b>  |

| [ Investing cash flow]  |
|---|
| Main contents of payments for tangible fixed assets acquired  |
| <ul style="list-style-type: none"> <li>• Shanghai subsidiary : <b>¥649 million</b></li> <li>• Hangzhou subsidiary : <b>¥1,424 million</b></li> <li>• Yinchuan subsidiary : <b>¥797 million</b></li> </ul> |

# Business forecast



| (¥ in millions)                             | FY3/16 | FY3/17(Est.) | YoY(%) |
|---|--------|--------------|--------|
| Net sales                                   | 69,463 | 75,000       | 8.0    |
| Operating income                            | 4,024  | 5,000        | 24.3   |
| Ordinary income                             | 3,822  | 4,200        | 9.9    |
| Net income attributable to owners of parent | 2,162  | 3,000        | 38.8   |
| Capital investment                          | 3,440  | 8,000        | 132.6  |
| Depreciation                                | 4,303  | 4,500        | 4.6    |

Note: Exchange rate FY3/16⇒FY3/17(assumed rate) : ¥ 121.03 → ¥ 105/ US dollar ¥ 19.19 → 16.50 /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



| (¥ in millions)                             | FY3/17 Est. |
|---|-------------|
| Net sales                                   | 75,000      |
| Operating income                            | 5,000       |
| Ordinary income                             | 4,200       |
| Net income attributable to owners of parent | 3,000       |

Forecast higher sales. Expect semiconductor capital investments to continue and more large investments involving organic EL panels. Installation of solar power facility is high due to the global CO2 reduction agreement. Also anticipate growth in orders for power semiconductor substrates.

Expect earnings to remain mostly strong. Plan to use the higher conversion rate of solar silicon products and solar cell products to improve earnings, with the aim of being profitable and increase earnings in the photovoltaic-related business. Foresee no downturns in the other two business segments either.

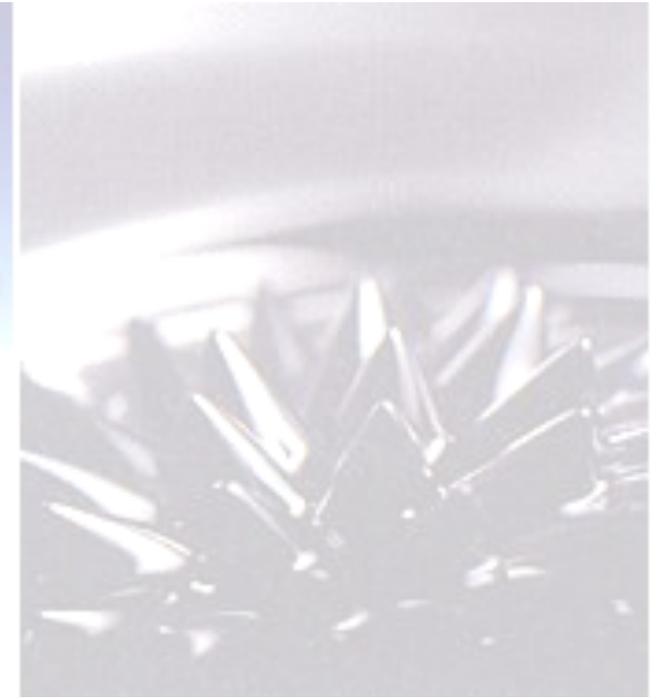
Expect a foreign exchange loss caused by the yen's strength but assume no change in other non-operating income and non-operating expenses.

Anticipate an effective tax rate of about 30%, assuming that major subsidiaries are profitable.

# Business forecast (sales by segment)



| (¥ in millions)             | FY3/16        | FY3/17(Est.)  | YoY(%)       |
|-----------------------------|---------------|---------------|--------------|
| <b>Equipment-related</b>    | <b>31,405</b> | <b>31,650</b> | <b>0.8</b>   |
| Vacuum Feedthroughs         | 7,163         | 7,400         | 3.3          |
| Quartz                      | 7,624         | 7,850         | 3.0          |
| Ceramics                    | 6,147         | 5,400         | △ 12.1       |
| CVD-SiC                     | 1,685         | 3,000         | 78.0         |
| EB-Gun, LED                 | 4,468         | 4,000         | △ 10.5       |
| Semiconductor wafer         | 4,317         | 4,000         | △ 7.3        |
| <b>Electronic device</b>    | <b>13,328</b> | <b>12,200</b> | <b>△ 8.5</b> |
| Thermo-electric module      | 12,559        | 11,500        | △ 8.4        |
| Ferrofluid, others          | 769           | 700           | △ 9.0        |
| <b>Photovoltaic-related</b> | <b>18,505</b> | <b>23,550</b> | <b>27.3</b>  |
| Quartz crucibles            | 3,524         | 3,500         | △ 0.7        |
| Solar silicon               | 8,483         | 12,000        | 41.5         |
| PV manufacturing Equip.     | 359           | 800           | 122.8        |
| Solar cell, Others          | 6,141         | 7,250         | 18.0         |
| <b>Others</b>               | <b>6,224</b>  | <b>7,600</b>  | <b>22.1</b>  |
| <b>Total</b>                | <b>69,463</b> | <b>75,000</b> | <b>8.0</b>   |



## FY March 2016 Financial Results

### Status by Segment and Outlook

# セグメント



Equipment-related

Vacuum feedthroughs



Quartz



Ceramics

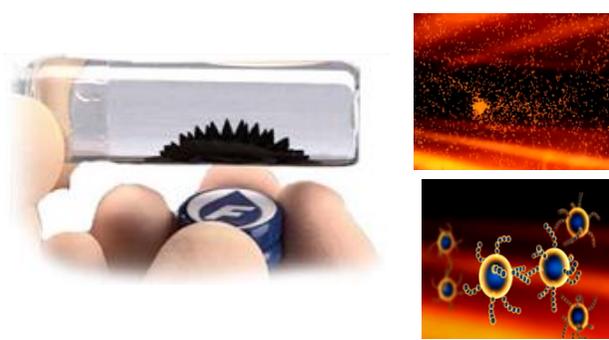


CVD-SiC



Electronic device

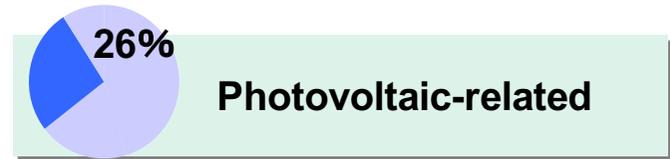
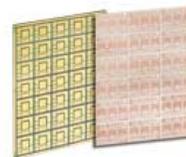
Ferrofluid



Thermo-electric module



Substrates for power semiconductor



Photovoltaic-related

PV silicon (Ingot) [OEM]

Single crystal ingot



Multi-crystal ingot



PV wafer



Solar cell



Consumable

Quartz crucible



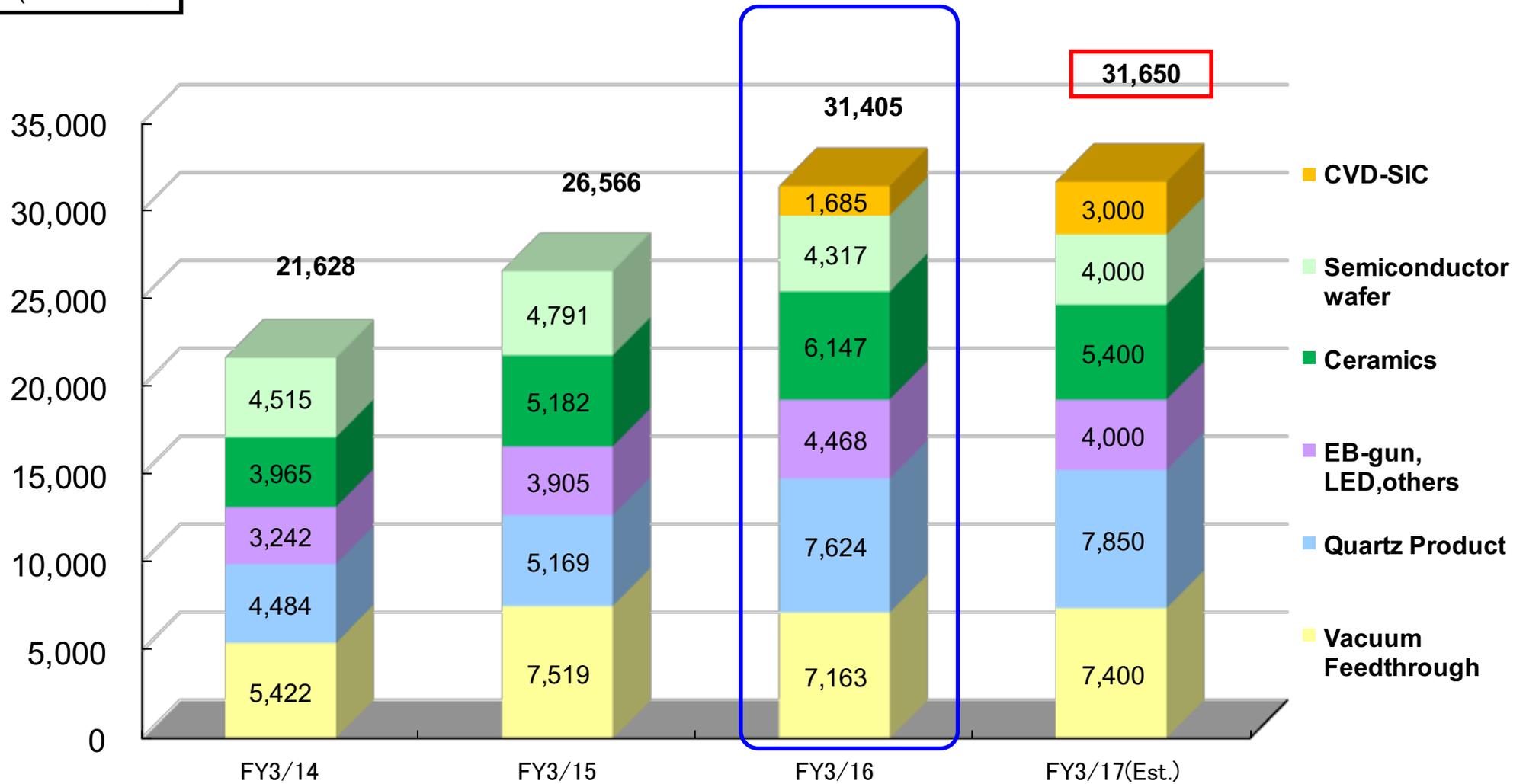
Vessel

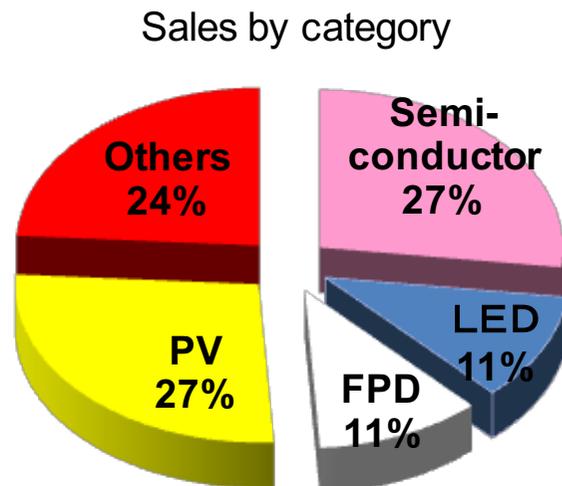
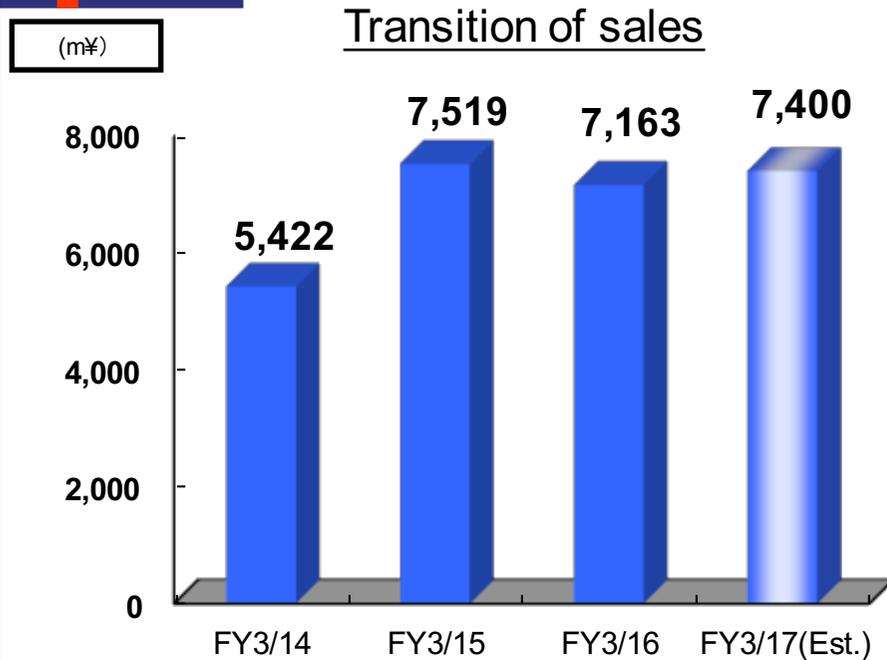


# Equipment-related Segment



Sales  
(¥ in million)





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

## 1. Status for FY3/16

- Major semiconductor miniaturisation investments ended and started declining but growth resumed in the second half of the FY.
- In the FPD market, Japanese and Chinese manufacturers continued making investments. Korean manufacturers started making investments in organic EL
- Demand involving robots used in FPD applications increased.
- In contract manufacturing, performance was slightly weak.
- Capital investment for photovoltaic equipment in Europe continued

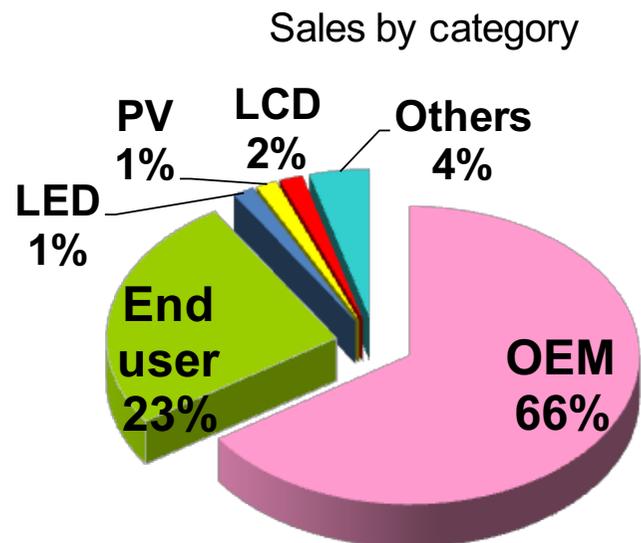
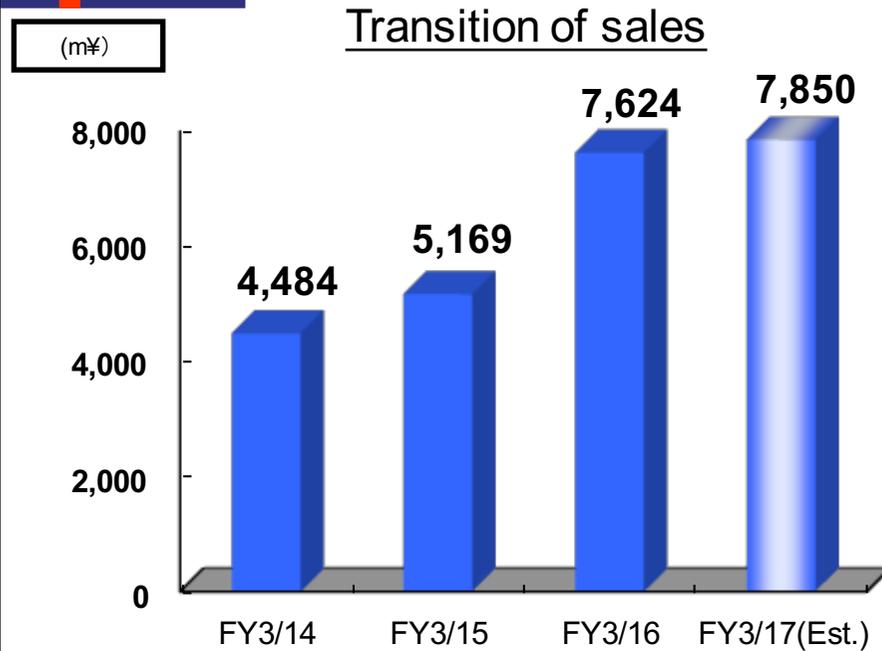
## 2. Outlook for FY3/17

- Expect a slight increase in the logic category of the semiconductor market.
- Anticipate a shift to 3D NAND memory devices; capital investment will continue
- In the FPD market, LCD investments in China will increase. In China and Japan as well as Korea, investment in organic EL is expected.
- Expect an upturn in demand from procurement activity within China.

## <Measures>

- Maintain strong ties with manufacturers of semiconductor production equipment.
- Continue operations involving contract manufacturing and subassembly processes.
- Enhance sales activity and strengthen the aftermarket in China, Korea and Taiwan.

# Status and Outlook for Quartz Products



## 1. Status for FY3/16

- Sales to a major US OEM customer were higher due to strong 4Q sales
- Sales to a major Japan OEM started increasing at the end of 2015
- Higher sales to end users in Japan and Asia
- Increase in sales of silicon parts(Boat) to a large foundry in Taiwan

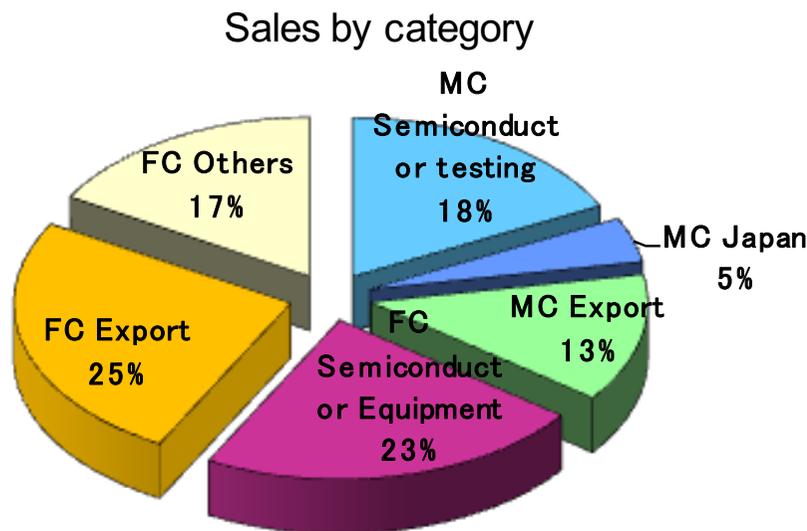
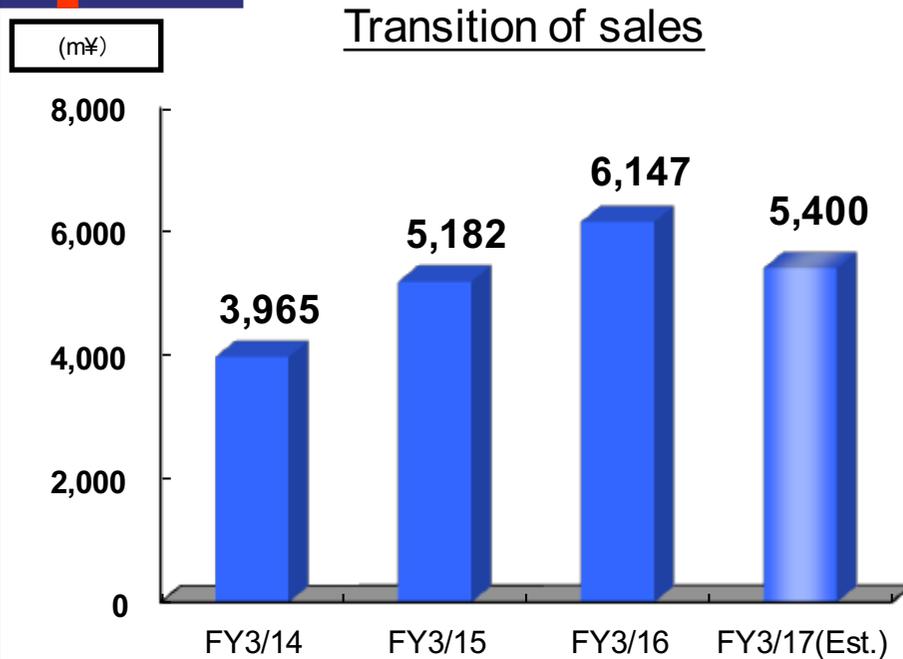
## 2. Outlook for FY3/17

- Expect growth in sales of products consumed during 3D production processes
- Anticipate continued strength in large Japanese and US OEM orders
- No significant change expected in capacity utilization at manufacturers in China and Taiwan
- Signs are appearing of substantial semiconductor industry investments in China
- Plan to make capital investments to increase production capacity

## <Measures>

- Deliver products faster by investing in people and equipment at factories
- Relocate production to start volume production of next-generation silicon wafers
- Continue to meet demand in Taiwan for customization

# Status and Outlook for Ceramics Products



FC(Fine Ceramics)、MC(Machinable Ceramics)

## 1. Status for FY3/16 (Jan. - Dec.)

### Machinable ceramics “Photoveel”

- Memory applications in Japan were slackening temporarily but in the second half orders from large overseas foundries increased in the logic category for next-generation smartphones and other products.

### Fine ceramics

- Orders slowed somewhat in the fall of 2015 as large semiconductor device makers pushed back investments for miniaturisation and growth in production.
- Demand at US companies weakened temporarily but this market is continuing to grow steadily.

## 2. Outlook for FY3/17 (Jan. -Dec.)

### Machinable ceramics “Photoveel”

- For memory applications in Japan, expect increasing demand for a new type of wafer circuit inspection equipment starting in the second half.
- At large overseas foundries, expect an increasing need for precision wafer circuit inspection equipment for next-generation smartphone logic devices.

### Fine ceramics

- Although demand is currently weak, anticipate growth in demand for parts required by new equipment for miniaturisation and 3D requirements at major client companies in Japan and other countries.

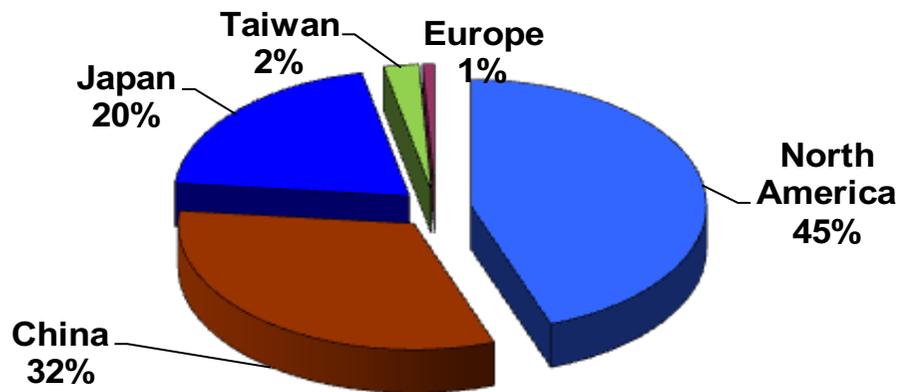
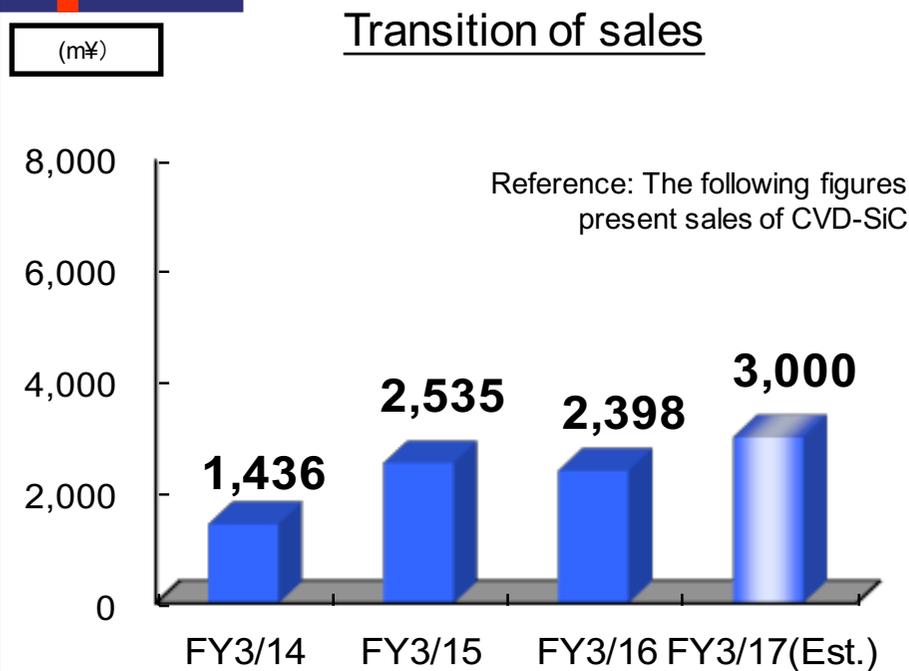
## 3. Continued sales policy

### < Machinable ceramics >

- Develop and sell a next-generation high-precision production technology to meet changing requirements for wafer circuit inspection equipment.

### <Fine ceramics>

- Plan to raise production capacity to meet expected growth in demand for parts used in new equipment needed as companies make more progress with miniaturisation.



Sales by region (FY3/16)

## 1. Status for FY3/16

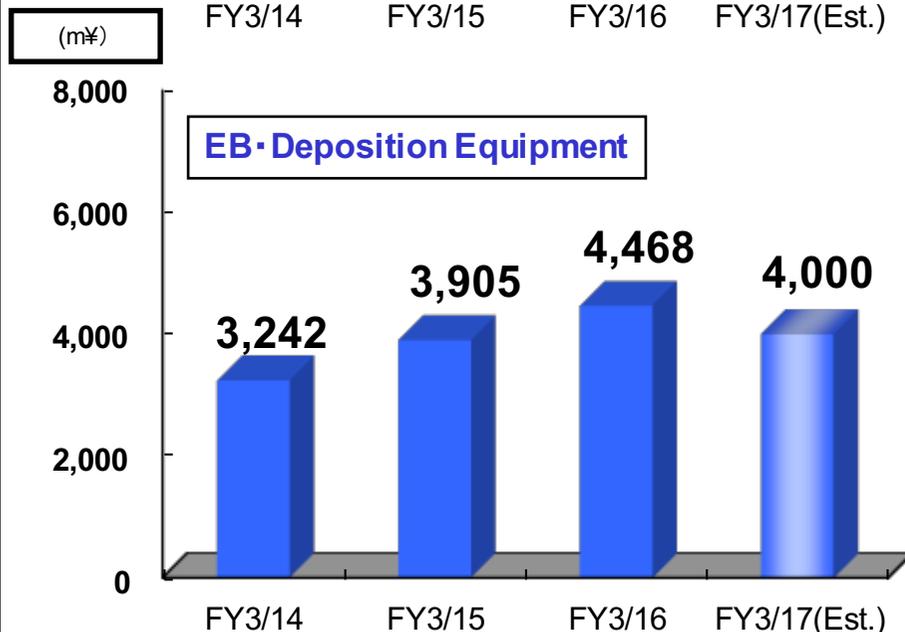
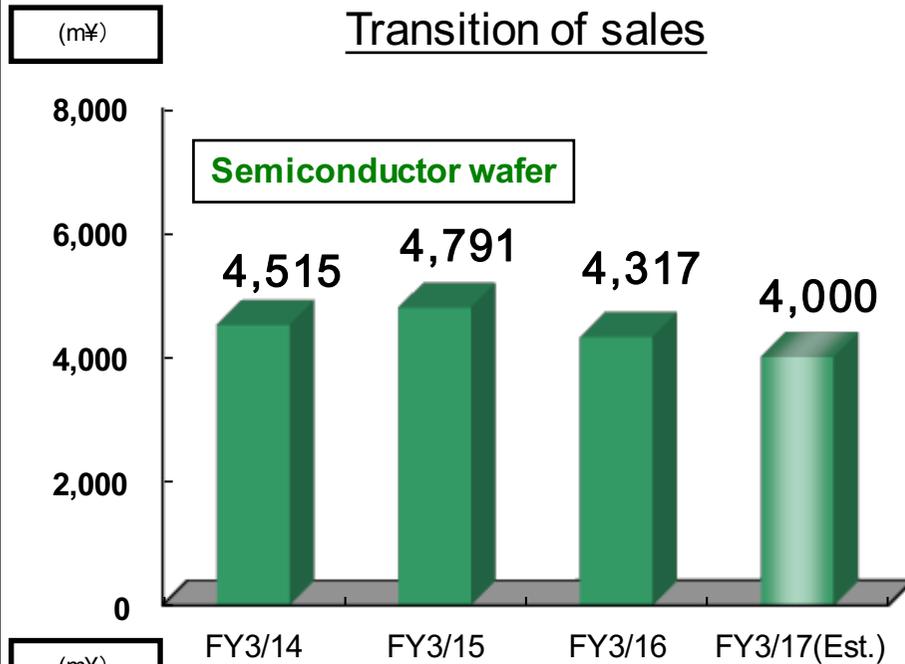
- Firm sales to large US companies
- Brisk sales in Japan
- In Asia, sales were down slightly in the first half but recovered in the second half.
- Succeeded in establishing a presence in the non-semiconductor sector

## 2. Outlook for FY3/17

- Expect sales to large US companies to remain strong.
- Anticipate strength in Japan and Asia, too
- Plan to capture receive for new OEM parts from major equipment manufacturers.
- Non-semiconductor sector sales will make an increasing contribution to sales in this business.

## [Measures]

- Capture more synergies by using the involvement of group companies
- Build a framework for quickly performing development and prototype activities
- Establish a manufacturing infrastructure capable of meeting the rapid growth in demand for OEM parts at major equipment manufacturers
- Continue to aggressively pursue opportunities outside the semiconductor industry



**Semiconductor wafers:**

**1. Status of FY3/16**

- Firm sales of products using Ferrotec’s own brands but demands for discounts are increasing
- In addition to Taiwan OEM operations, started production for OEM customers in Europe
- Small decline in sales caused by intense price competition for automotive applications

**2. Outlook for FY3/17**

- Foresee a continuation of heated competition based on prices.
- 8-inch wafer demand is rising in China; plan to quickly start operations in this market sector

**<Measures>**

Establishing an infrastructure for 8-inch wafer operations in China, including the start of construction of a factory

**EB gun and deposition equipment:**

**1. Status of FY3/16**

- Received large orders for wireless communication chips; LED market was flat all year.
- The optical EB gun market was generally strong all year.

**2. Outlook for 3/17**

- Expect more applications involving compound semiconductors
- Anticipate strong demand for communication chip applications

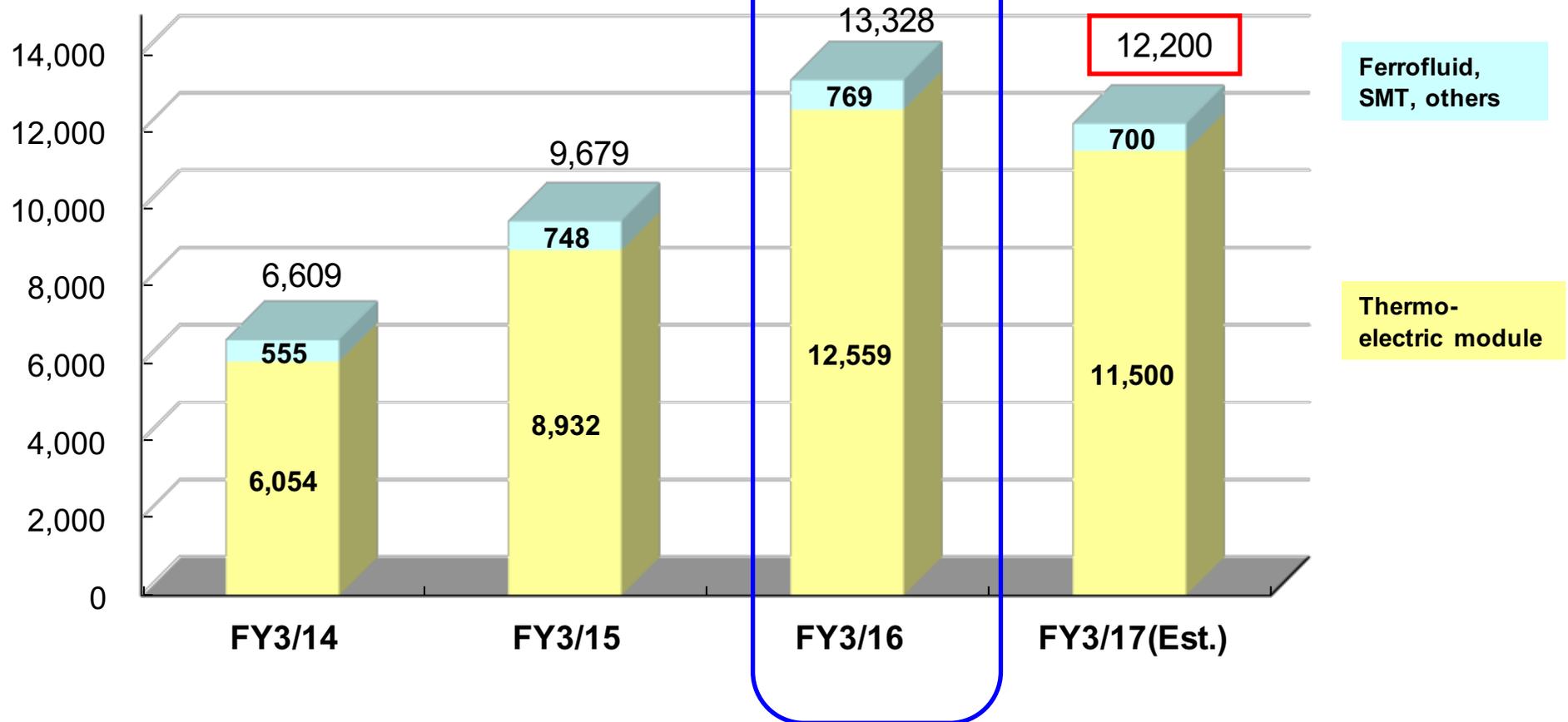
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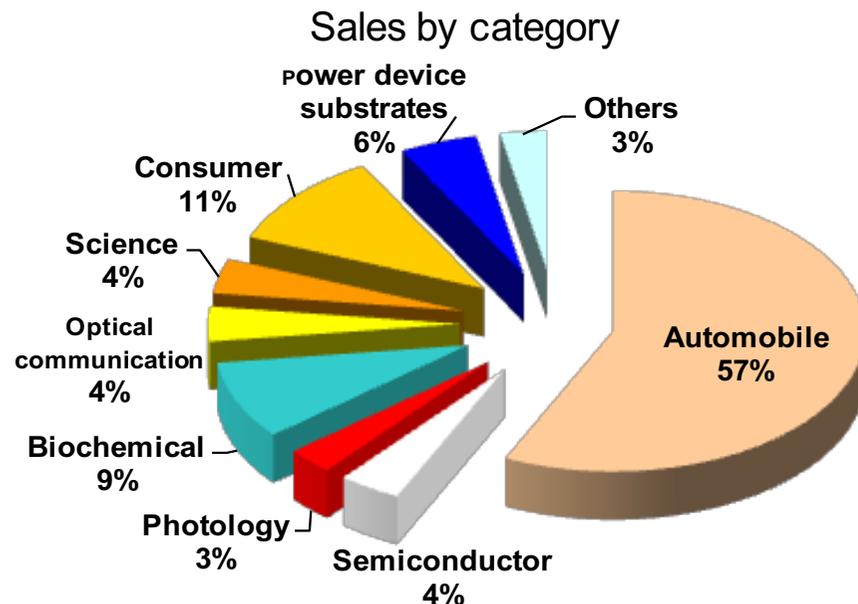
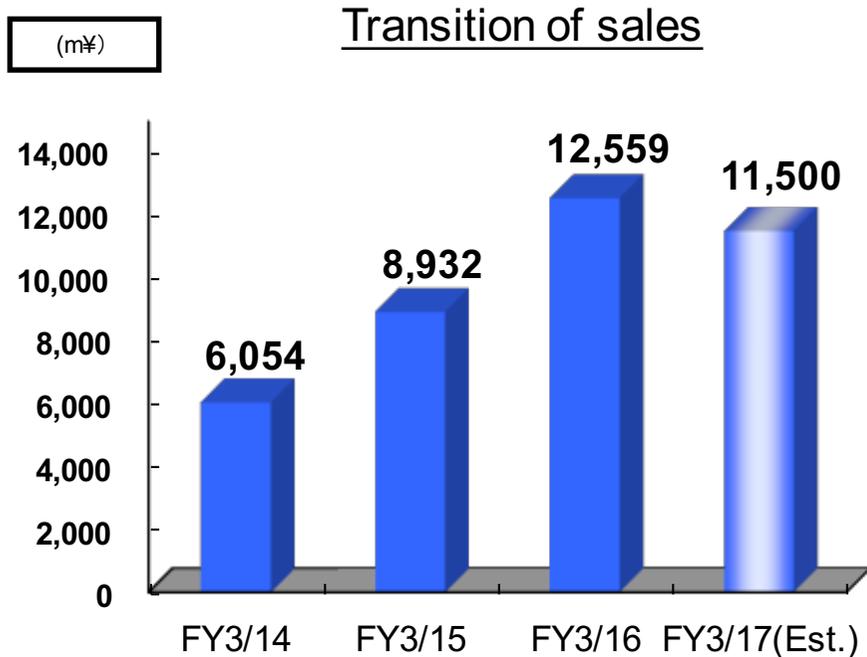
- Deposition equipment: Sales activities are focusing on wireless communication chips and semiconductor power devices
- EB guns: Concentrating on operation to equipment manufacturers

# Electronic Device Segment



Sales  
(¥ in million)





## 1. Status of FY3/16

### Automobile Seat Application

- Demand remained strong in North America and sales volume reached the level prior to the global financial crisis.

### Other Applications

- Consumer product demand was strong and the number of prospective orders increased.
- In China, communication equipment-related demand benefited from the switch from 3G to 4G.
- Orders for bio/medical applications remained steady.
- A large European manufacturer certified a substrate for power semiconductor devices.

## 2. Outlook for 3/17

### Automobile Seat Application

- The yen's strength, the peaking of the US market and concerns for interest rate hike make the outlook somewhat negative.

### Other Applications

- Expect generally flat performance but new orders may boost sales and earnings
- Increasing the lineup of sub-assembly products and reinforcing sales activities (consumer products)
- Make investments to increase output of substrates for semiconductor power devices

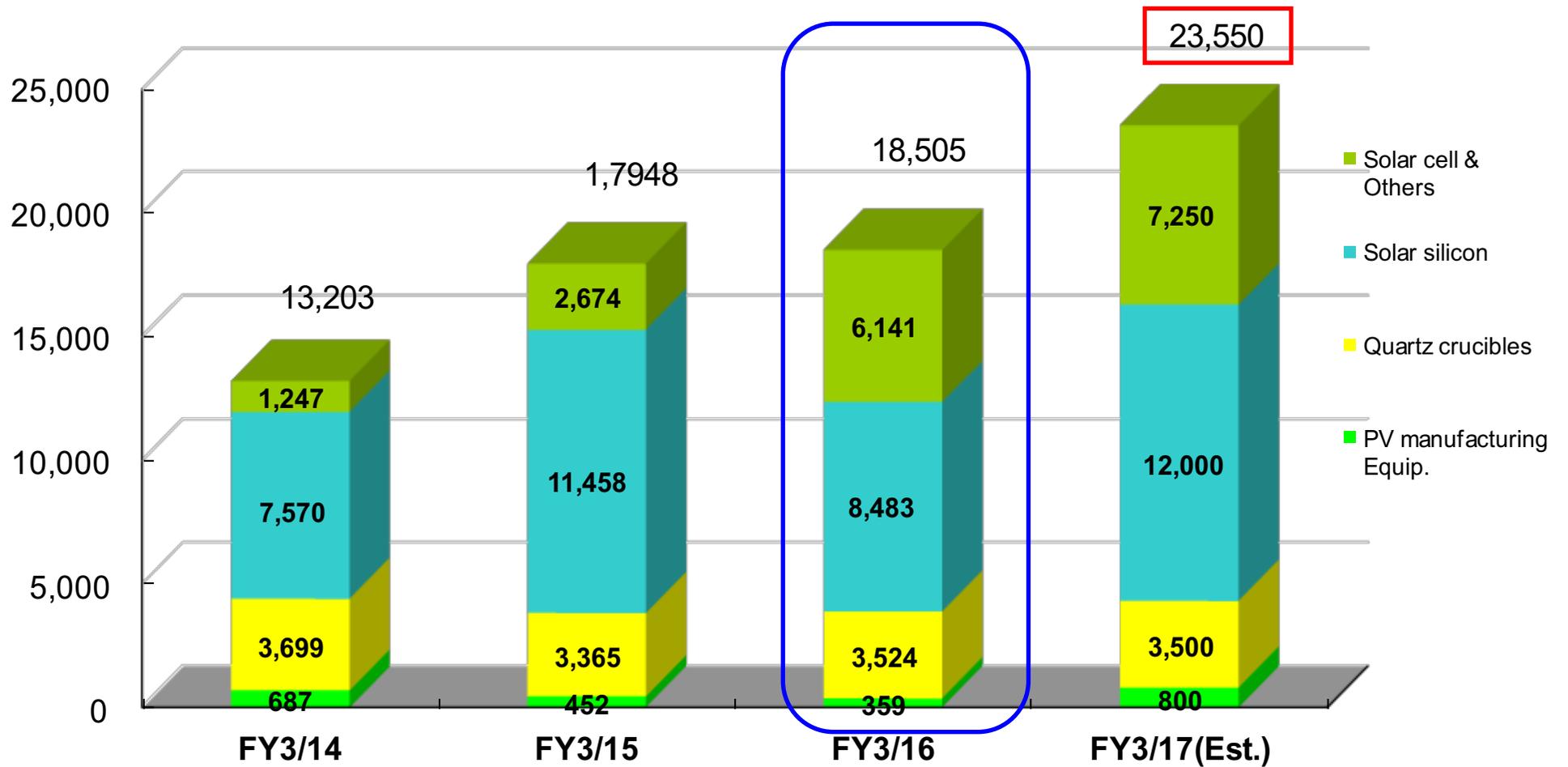
### [Measures]

- Continue providing support for developing customer solution products.
- Make automation investments to increase output and cut costs.
- Continue to make investments for the volume production of semiconductor power device substrates.

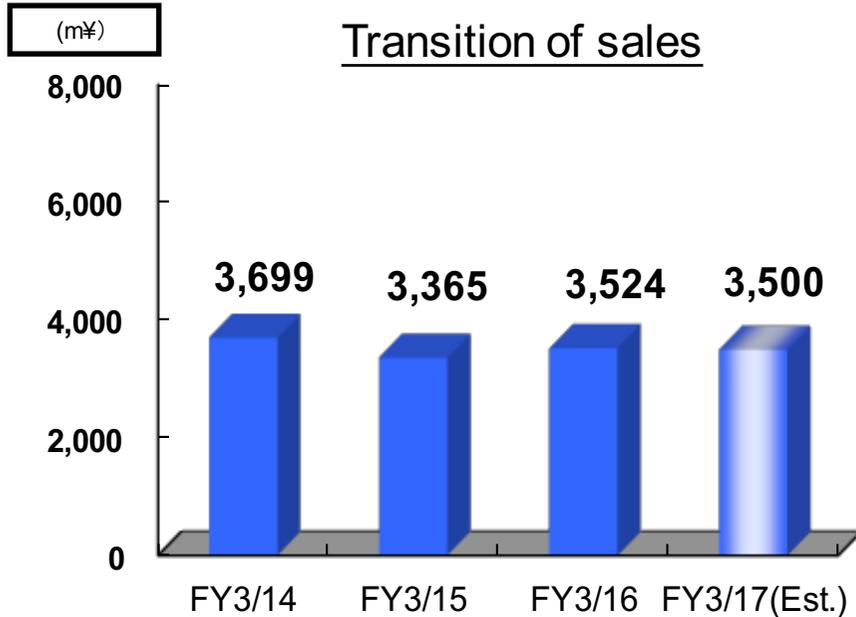
# Photovoltaic-related Segment



Sales  
(¥ in million)



# Status and Outlook for Quartz Crucibles



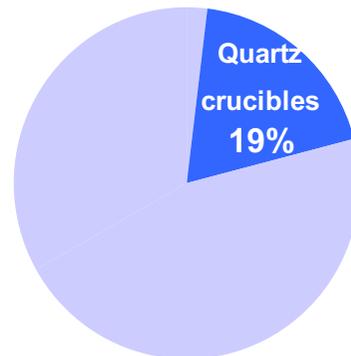
Mono-crystal quartz crucible



Multi-crystal vessel

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

**FY3/16**



## 1. Status for FY3/16

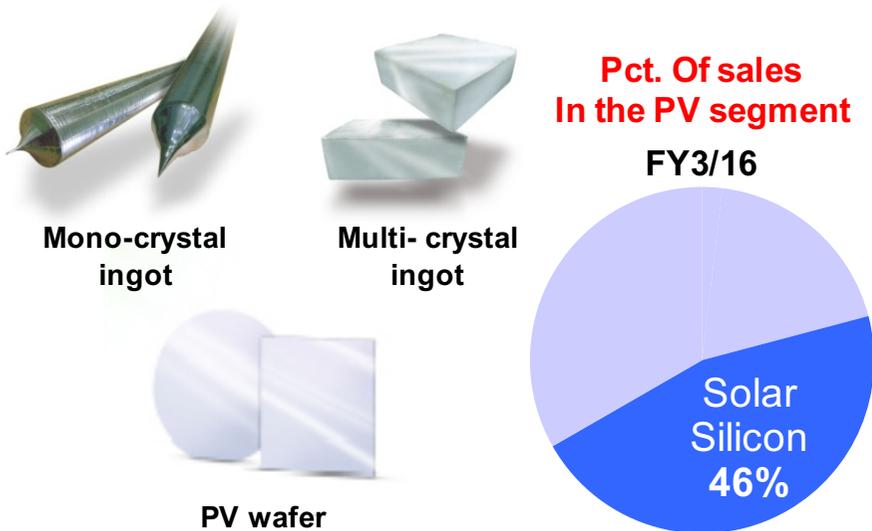
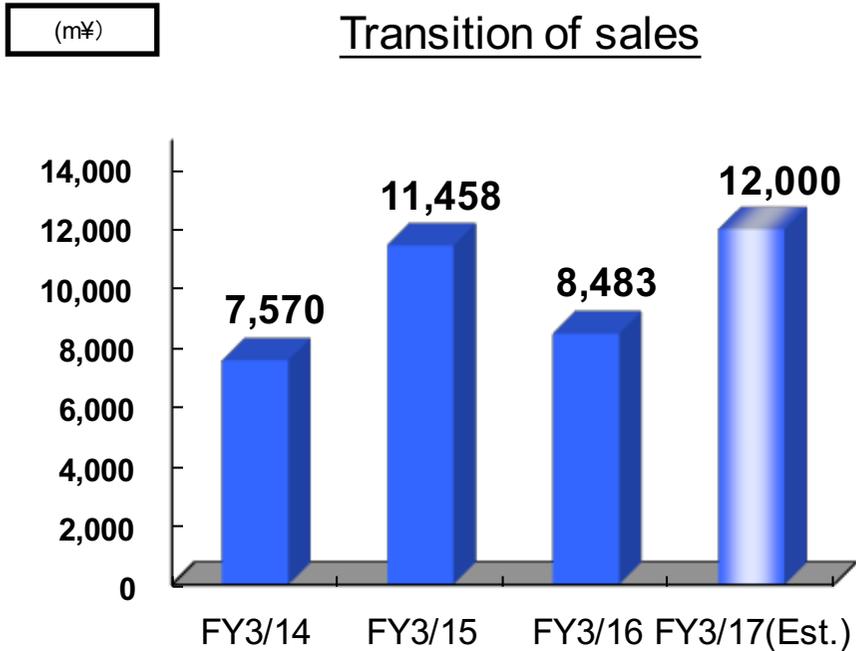
- Slow growth as solar facility installations in China increase
- Transfer of operations to the Yinchuan plant produced benefits, and sales of small-diameter products were strong due to the launch of an improved crucible for the semiconductor industry
- Started making evaluation samples of medium-diameter (24 inches) crucibles for semiconductor devices
- Expect a slow recovery in sales of multi-crystal vessels
- The multi-crystal market in China has shifted to the large G6 size.
- Expect moderate growth in sales in the crucible, vessel and small-diameter semiconductor wafer categories

## 2. Outlook for FY3/17

- Expect a consistent improvement in earnings at the Yinchuan plant
- Slow growth in demand in the semiconductor sector
- Anticipate growth in demand for multi-crystal vessels as the use large G6 sizes.
- Expect growth that will be offset by foreign exchange rates, resulting in no change in sales.

### <Measures>

- Supply only value-added versions of mono-crystal semiconductor crucibles.
- Use the full-capacity output of the Yinchuan plant to become more price competitive.
- Install a furnace for large-diameter 28-inch crucibles for the semiconductor industry.
- Improve quality by automating a coating technology.



## 1. Status for FY3/16

- Current OEM customers held down production through the year.
- Volume production evaluations by a new OEM customer started.
- Technological progress such as making mono-crystal wafers thinner and reducing the amount of oxygen
- Global solar installation in 2015 surpassed 51GW (IEA flash report).
- Emerging country solar facility installations are increasing and now exceed developed countries, (China ranks first), but performance in industrialized regions (Europe and Japan) was weak
- Prices of photovoltaic products remained low throughout the year

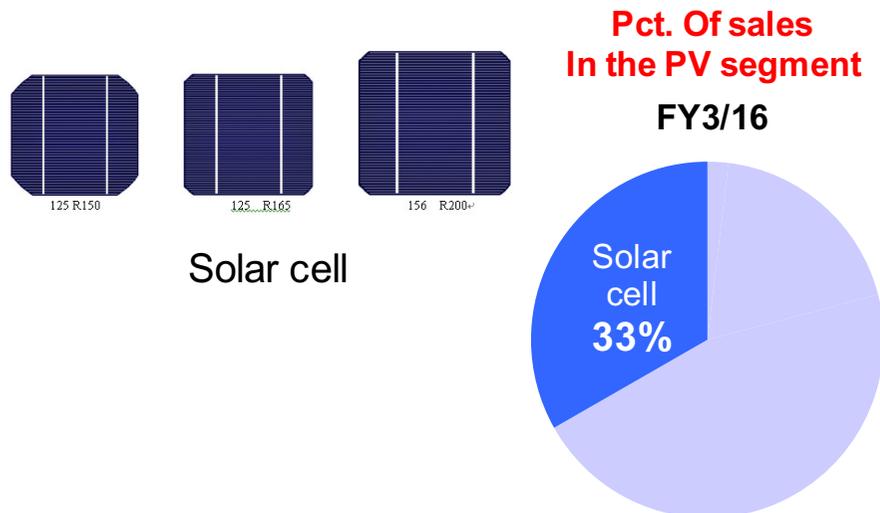
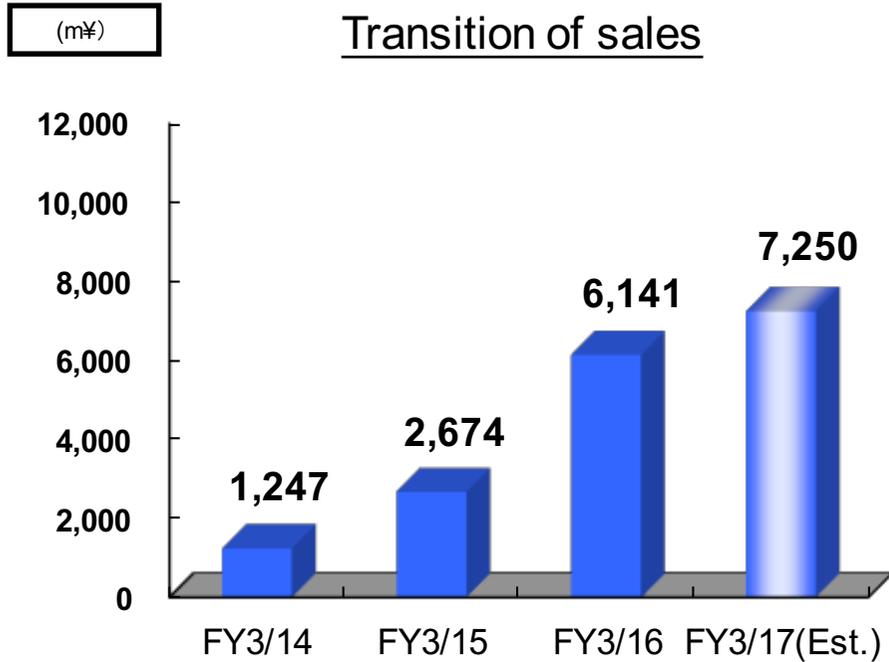
## 2. Outlook for FY3/17

- After final evaluation by a new OEM customer, plan to start volume production in the second half of the fiscal year
- Use advanced technologies to meet the demand for thinner wires.
- More solar power will be needed by 2020 to meet the requirements of the COP21 Paris Agreement
- More US demand expected due to the feed-in tariff postponement; China outlook is unclear but growth will probably continue
- Foresee growth in India, South Africa, Chile, Mexico, Turkey, Honduras, Argentina and other emerging countries

### <Measures>

- Operating the Yinchuan plant at full capacity for crystal production
- Using a fixed abrasives (wire saw) to make thinner wafers
- Improve the performance of N-type mono crystals to meet customers' demands
- Earn recognition as a provider of the world's most advanced thinner wire technologies

# Status and Outlook for Solar cell



## 1. Status for FY3/16

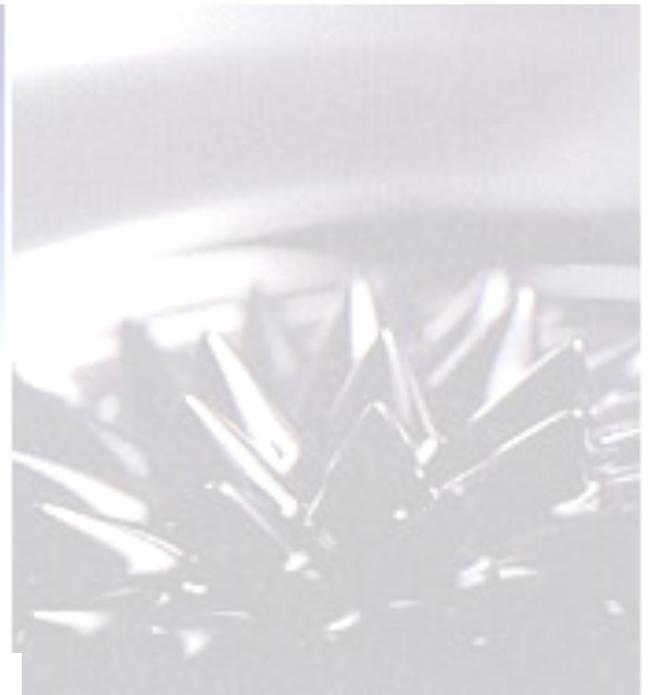
- Demand was strong in China and India with powerful government support.
- Solar installations in India were 2.2GW in 2015.
- Met demands for volume production of mono and multi-crystal solar cells.
- Increasing demands for high conversion efficiency and lower prices
- Emerging country installations increased and surpassed developed countries (China ranks first).

## 2. Outlook for FY3/17

- Expect very strong demand for multi-crystal products and more growth in emerging countries, mainly China and India.
- Increasing demands in China and other countries for high conversion efficiency
- Operating at full capacity and adding an automated production line to increase output

## <Measures>

- Improve earnings by using passive emitter rear contact (PERC) technology to increase conversion efficiency.
- Become more competitive by using wafer quality and solar cell technologies.
- Increase productivity of mono and multi-crystal products.
- Cut costs by using automation.



## Reference Materials

|                    |   |
|--------------------|---|
| Corporate Name     | Ferrotec 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   | <ul style="list-style-type: none"> <li>• <b>Equipment-related business</b> : Vacuum Feedthrough, Quartz, Ceramics, silicon, wafer processing</li> <li>• <b>PV-related business</b> : PV manufacturing equip, Quartz crucibles, solar silicon</li> <li>• <b>Electronic device business</b> : thermo-electric module, Ferrofluid</li> </ul> |
| Capital            | 13,201,346,010 JPY  |
| Issued Stock       | 30,903,702  |
| Related Company    | <p>[27 Consolidated Subsidiary]</p> <p>[5 Companies Accounted for by the Equity Method]</p>   |
| Employees          | [Consolidated]5,411 [Non-consolidated]129   |

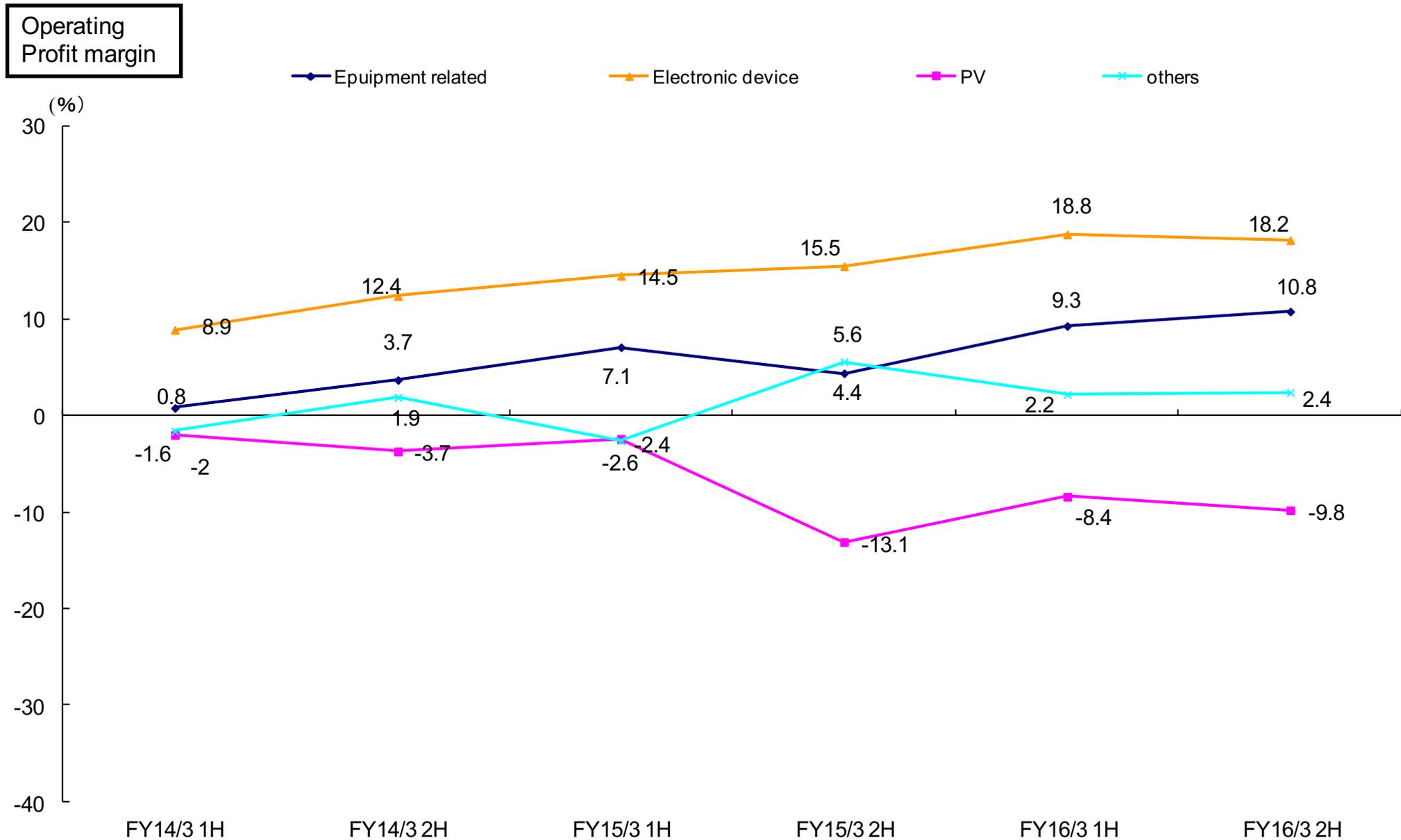
# Corporate history



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

| With a core of ferrofluid expertise          | Establishing operations in other countries  | Building a new profit structure   |
|--|---|---|
| <p>~ <b>Ferrotec's core Technology</b> ~</p> | <p>91: Established subsidiary in Massachusetts, <b>USA</b><br/>92: Established subsidiary in Hangzhou, <b>China</b><br/>95: Established subsidiary in Shanghai, <b>China</b><br/>97: Established subsidiary in <b>Singapore</b><br/>99: Started operations in <b>North America</b> and <b>Europe</b> by acquiring Ferrofluidics</p> | <p><b>02: Started contract manufacturing service (CMS) business at the Shanghai factory, including silicon wafer processing, machine tool production and other activities</b><br/>Expertise in production technologies extending from component processing to final assembly allowed Ferrotec to start the CMS business</p> <p><b>05: Increased manufacturing and sales activities for photovoltaic products in Hangzhou, China</b></p> |

# Operating Margin by Business Segment



# Strategies for M&A and Alliances



| Time        | Company acquired/Alliance partner  | Description  |
|-------------|--|--|
| July 2015   | Acquired ADMAP Inc.  | Acquired ADMAP which manufactures and sells <b>CVD-SiC products</b>  |
| Oct. 2011   | Merged with a subsidiary   | Merged with Ferrotec silicon which manufactures and sells <b>mono crystal silicon products</b>   |
| 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 <b>vessels and related products.</b>  |
| Jul. 2010   | Acquired shares of IMI in the US   | Began sales of <b>pure silicon products</b>  |
| April. 2010 | Merged with a subsidiary   | Merged with <b>Ferrotec Quartz</b> 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 <b>electron beam-based evaporative coating systems.</b>  |
| July. 2008  | Acquired of Sumikin Ceramics. Changed the name of the company.                               | Acquired 90% of the surviving company <b>Sumikin Ceramics &amp; Quartz Co., Ltd.</b> 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 <b>solar cell manufacturing equipment.</b>  |
| 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 <b>Vacuum Feedthrough.</b>  |
| Nov. 2006   | Merger and liquidation   | Merged with Ferrotec Precision, which produces <b>Vacuum feedthrough.</b> Liquidated two subsidiaries(Dec.).   |
| Sep. 2006   | Established a joint venture in Taiwan  | Established Ferrotec Taiwan jointly with a local partner to sell <b>vacuum feedthroughs</b> and offer maintenance services   |
| Dec. 2005   | Established a joint venture with LTD Ceramics Inc. (USA)                                     | Established joint venture in China to manufacture <b>ceramics</b>  |
| July 2005   | Acquired NORD Co., Ltd.(Russia)  | Acquired company that manufactures and sells <b>Peltier (thermoelectric) devices</b> in order to increase share of global market   |
| May 2005    | Business alliance with KSM Inc.(Korea)   | Alliance for mutual sales of <b>vacuum feedthroughs</b> and products associated with semiconductor manufacturing equipment   |
| July 2004   | Exclusive contract with Applied Films(Germany)   | Gave this company exclusive rights to purchase Ferrotec <b>vacuum feedthroughs</b>   |
| 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 <b>quartz products</b> in China   |
| Feb. 2002   | Business alliance with Toshiba Ceramics and Mitsui Co. for wafer production by commissioning | Ferrotec <b>silicon wafer</b> production equipment moved to China factory to conduct a CMS business, and manufacturing is outsourced to this factory   |

# Sales and Operating income Trend



## Sales Trend

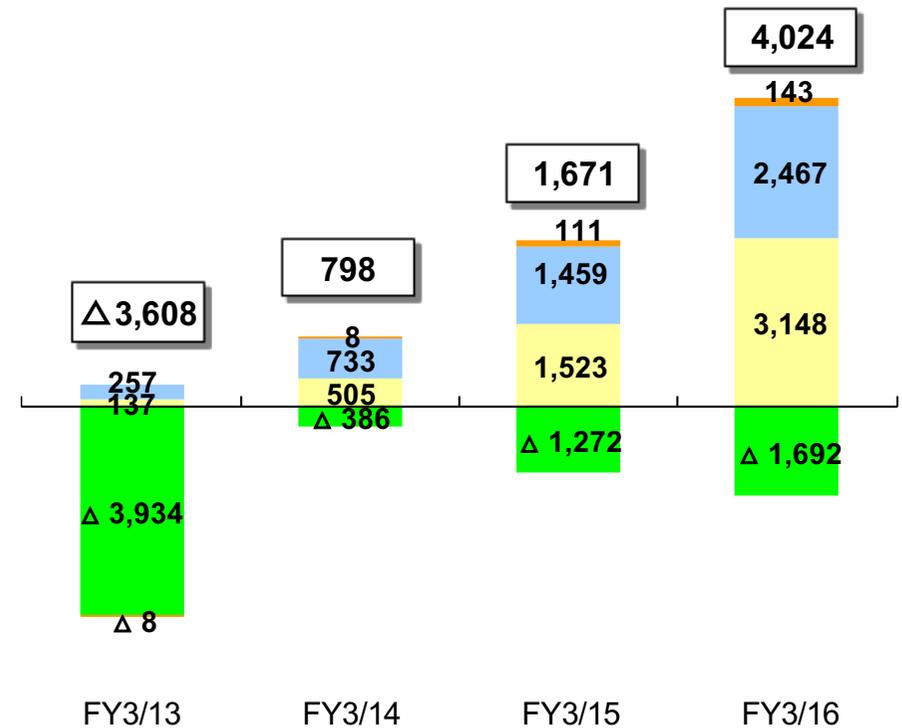
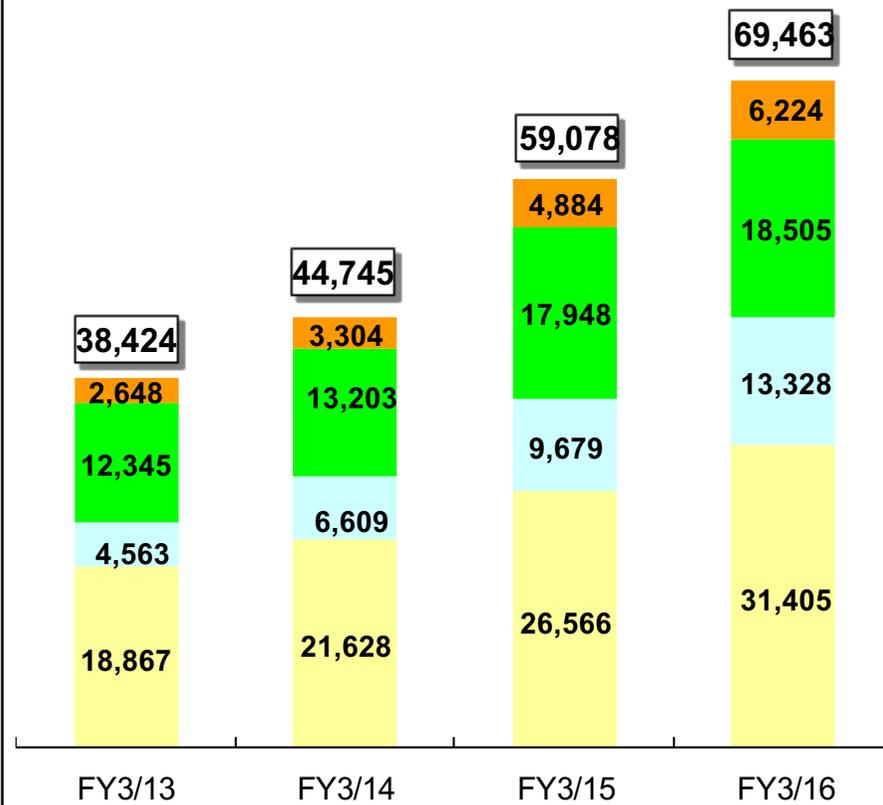
## Operating income Trend

(¥ in millions)

(¥ in millions)

Equipment related   Electronic device   PV   Others

Equipment related   Electronic device   PV   Others



# Business performance ( FY3/16 revised plan vs. results )



| ¥ in millions           | FY3/16 revised plan |                  | FY3/16 Results |                  |              |                |
|-------------------------|---------------------|------------------|----------------|------------------|--------------|----------------|
|                         | Amount              | Pct. Of Sales(%) | Amount         | Pct. Of Sales(%) | Amount       | Pct. change(%) |
| Equipment-related       | 30,000              | 45.5             | 31,405         | 45.2             | 1,405        | 4.7            |
| Vacuum Feedthroughs     | 6,857               | 10.4             | 7,163          | 10.3             | 306          | 4.5            |
| Quartz                  | 7,085               | 10.7             | 7,624          | 11.0             | 539          | 7.6            |
| Ceramics                | 5,800               | 8.8              | 6,147          | 8.8              | 347          | 6.0            |
| CVD-SiC                 | 1,524               | 2.3              | 1,685          | 2.4              | 161          | 10.            |
| EB-Gun, LED             | 3,971               | 6.0              | 4,468          | 6.4              | 497          | 12.5           |
| Semiconductor Wafer     | 4,763               | 7.2              | 4,317          | 6.2              | △ 446        | △ 9.4          |
| Electronic device       | 12,500              | 18.9             | 13,328         | 19.2             | 828          | 6.6            |
| Thermo-electric module  | 11,708              | 17.7             | 12,559         | 18.1             | 851          | 7.3            |
| Ferrofluid, others      | 792                 | 1.2              | 769            | 1.1              | △ 23         | △ 2.9          |
| Photovoltaic-related    | 17,400              | 26.4             | 18,505         | 26.6             | 1,105        | 6.4            |
| Quartz crucibles        | 3,314               | 5.0              | 3,524          | 5.1              | 210          | 6.3            |
| Solar silicon           | 9,641               | 14.6             | 8,483          | 12.2             | △ 1,158      | △ 12.0         |
| PV manufacturing Equip. | 353                 | 0.5              | 359            | 0.5              | 6            | 1.7            |
| Solar cell, Others      | 4,092               | 6.2              | 6,141          | 8.8              | 2,049        | 50.1           |
| Others                  | 6,100               | 9.2              | 6,224          | 9.0              | 124          | 2.0            |
| <b>Total</b>            | <b>66,000</b>       | <b>100.0</b>     | <b>69,463</b>  | <b>100.0</b>     | <b>3,463</b> | <b>5.2</b>     |

|                          |        |      |        |      |     |      |
|--------------------------|--------|------|--------|------|-----|------|
| <b>Gross income</b>      | 16,688 | 25.3 | 17,313 | 24.9 | 625 | 3.7  |
| <b>SG&amp;A expenses</b> | 13,288 | 20.1 | 13,289 | 19.1 | 1   | 0.0  |
| <b>Operating income</b>  | 3,400  | 5.2  | 4,024  | 5.8  | 624 | 18.4 |
| <b>Ordinary income</b>   | 3,000  | 4.5  | 3,822  | 5.5  | 822 | 27.4 |
| <b>Net income</b>        | 1,900  | 2.9  | 2,162  | 3.1  | 262 | 13.8 |

※Net income=Net income attributable to owners of parent

# Business performance ( FY3/16 1st half vs. 2nd half )



| ¥ in millions           | FY3/16 1 <sup>st</sup> half |                  | FY3/16 2 <sup>nd</sup> half |                  |              |                |
|-------------------------|-----------------------------|------------------|-----------------------------|------------------|--------------|----------------|
|                         | Amount                      | Pct. Of Sales(%) | Amount                      | Pct. Of Sales(%) | Amount       | Pct. change(%) |
| Equipment-related       | 15,491                      | 46.1             | 15,914                      | 44.4             | 423          | 2.7            |
| Vacuum Feedthroughs     | 3,527                       | 10.5             | 3,636                       | 10.1             | 109          | 3.1            |
| Quartz                  | 3,625                       | 10.8             | 3,999                       | 11.2             | 374          | 10.3           |
| Ceramics                | 3,270                       | 9.7              | 2,877                       | 8.0              | △ 393        | △ 12.0         |
| CVD-SiC                 | 504                         | 1.5              | 1,181                       | 3.3              | 677          | 134.3          |
| EB-Gun, LED             | 1,941                       | 5.8              | 2,527                       | 7.0              | 586          | 30.2           |
| Semiconductor Wafer     | 2,624                       | 7.8              | 1,693                       | 4.7              | △ 931        | △ 35.5         |
| Electronic device       | 6,466                       | 19.2             | 6,862                       | 19.1             | 396          | 6.1            |
| Thermo-electric module  | 6,074                       | 18.1             | 6,485                       | 18.1             | 411          | 6.8            |
| Ferrofluid, others      | 392                         | 1.2              | 377                         | 1.1              | △ 15         | △ 3.8          |
| Photovoltaic-related    | 8,741                       | 26.0             | 9,764                       | 27.2             | 1,023        | 11.7           |
| Quartz crucibles        | 1,704                       | 5.1              | 1,820                       | 5.1              | 116          | 6.8            |
| Solar silicon           | 5,241                       | 15.6             | 3,242                       | 9.0              | △ 1,999      | △ 38.1         |
| PV manufacturing Equip. | 104                         | 0.3              | 255                         | 0.7              | 151          | 145.2          |
| Solar cell, Others      | 1,692                       | 5.0              | 4,449                       | 12.4             | 2,757        | 162.9          |
| Others                  | 2,917                       | 8.7              | 3,307                       | 9.2              | 390          | 13.4           |
| <b>Total</b>            | <b>33,615</b>               | <b>100.0</b>     | <b>35,848</b>               | <b>100.0</b>     | <b>2,233</b> | <b>6.6</b>     |

|                          |       |      |       |      |       |        |
|--------------------------|-------|------|-------|------|-------|--------|
| <b>Gross income</b>      | 8,548 | 25.4 | 8,765 | 24.5 | 217   | 2.5    |
| <b>SG&amp;A expenses</b> | 6,605 | 19.6 | 6,684 | 18.6 | 79    | 1.2    |
| <b>Operating income</b>  | 1,942 | 5.8  | 2,082 | 5.8  | 140   | 7.2    |
| <b>Ordinary income</b>   | 1,888 | 5.6  | 1,934 | 5.4  | 46    | 2.4    |
| <b>Net income</b>        | 1,202 | 3.6  | 960   | 2.7  | △ 242 | △ 20.1 |

※Net income=Net income attributable to owners of parent

# Business performance ( FY3/15 vs. FY3/16 )



| ¥ in millions           | FY3/15 Results |                  | FY3/16 Results |                  |               |                |
|-------------------------|----------------|------------------|----------------|------------------|---------------|----------------|
|                         | Amount         | Pct. Of Sales(%) | Amount         | Pct. Of Sales(%) | Amount        | Pct. change(%) |
| Equipment-related       | 26,566         | 45.0             | 31,405         | 45.2             | 4,839         | 18.2           |
| Vacuum Feedthroughs     | 7,519          | 12.7             | 7,163          | 10.3             | △ 356         | △ 4.7          |
| Quartz                  | 5,169          | 8.7              | 7,624          | 11.0             | 2,455         | 47.5           |
| Ceramics                | 5,182          | 8.8              | 6,147          | 8.8              | 965           | 18.6           |
| CVD-SiC                 | -              | -                | 1,685          | 2.4              | -             | -              |
| EB-Gun, LED             | 3,905          | 6.6              | 4,468          | 6.4              | 563           | 14.4           |
| Semiconductor wafer     | 4,791          | 8.1              | 4,317          | 6.2              | △ 474         | △ 9.9          |
| Electronic device       | 9,679          | 16.4             | 13,328         | 19.2             | 3,649         | 37.7           |
| Thermo-electric module  | 8,932          | 15.1             | 12,559         | 18.1             | 3,627         | 40.6           |
| Ferrofluid, others      | 748            | 1.3              | 769            | 1.1              | 21            | 2.8            |
| Photovoltaic-related    | 17,948         | 30.4             | 18,505         | 26.6             | 557           | 3.1            |
| Quartz crucibles        | 3,365          | 5.7              | 3,524          | 5.1              | 159           | 4.7            |
| Solar silicon           | 11,458         | 19.4             | 8,483          | 12.2             | △ 2,975       | △ 26.0         |
| PV manufacturing Equip. | 452            | 0.8              | 359            | 0.5              | △ 93          | △ 20.6         |
| Solar cell, Others      | 2,674          | 4.5              | 6,141          | 8.8              | 3,467         | 129.7          |
| Others                  | 4,884          | 8.3              | 6,224          | 9.0              | 1,340         | 27.4           |
| <b>Total</b>            | <b>59,078</b>  | <b>100.0</b>     | <b>69,463</b>  | <b>100.0</b>     | <b>10,385</b> | <b>17.6</b>    |

|                    |         |      |        |      |       |       |
|--------------------|---------|------|--------|------|-------|-------|
| Gross income       | 13,484  | 22.8 | 17,313 | 24.9 | 3,829 | 28.4  |
| SG&A expenses      | 11,813  | 20.0 | 13,289 | 19.1 | 1,476 | 12.5  |
| Operating income   | 1,671   | 2.8  | 4,024  | 5.8  | 2,353 | 140.8 |
| Ordinary income    | 2,030   | 3.4  | 3,822  | 5.5  | 1,792 | 88.3  |
| Net income         | △ 2,132 | -    | 2,162  | 3.1  | 4,294 | -     |
| Capital Investment | 3,375   | -    | 3,440  | -    | 65    | 1.9   |
| Depreciation       | 3,964   | -    | 4,303  | -    | 339   | 8.6   |

# Business performance ( FY3/16 vs. FY3/17 Plan )



| ¥ in millions           | FY3/16 Results |                  | FY3/17 Plan   |                  |              |                |
|-------------------------|----------------|------------------|---------------|------------------|--------------|----------------|
|                         | Amount         | Pct. Of Sales(%) | Amount        | Pct. Of Sales(%) | Amount       | Pct. change(%) |
| Equipment-related       | 31,405         | 45.2             | 31,650        | 42.2             | 245          | 0.8            |
| Vacuum Feedthroughs     | 7,163          | 10.3             | 7,400         | 9.9              | 237          | 3.3            |
| Quartz                  | 7,624          | 11.0             | 7,850         | 10.5             | 226          | 3.0            |
| Ceramics                | 6,147          | 8.8              | 5,400         | 7.2              | △ 747        | △ 12.1         |
| CVD-SiC                 | 1,685          | 2.4              | 3,000         | 4.0              | 1,315        | 78.0           |
| EB-Gun, LED             | 4,468          | 6.4              | 4,000         | 5.3              | △ 468        | △ 10.5         |
| Semiconductor wafer     | 4,317          | 6.2              | 4,000         | 5.3              | △ 317        | △ 7.3          |
| Electronic device       | 13,328         | 19.2             | 12,200        | 16.3             | △ 1,128      | △ 8.5          |
| Thermo-electric module  | 12,559         | 18.1             | 11,500        | 15.3             | △ 1,059      | △ 8.4          |
| Ferrofluid, others      | 769            | 1.1              | 700           | 0.9              | △ 69         | △ 9.0          |
| Photovoltaic-related    | 18,505         | 26.6             | 23,550        | 31.4             | 5,045        | 27.3           |
| Quartz crucibles        | 3,524          | 5.1              | 3,500         | 4.7              | △ 24         | △ 0.7          |
| Solar silicon           | 8,483          | 12.2             | 12,000        | 16.0             | 3,517        | 41.5           |
| PV manufacturing Equip. | 359            | 0.5              | 800           | 1.1              | 441          | 122.8          |
| Solar cell, Others      | 6,141          | 8.8              | 7,250         | 9.7              | 1,109        | 18.0           |
| Others                  | 6,224          | 9.0              | 7,600         | 10.1             | 1,376        | 22.1           |
| <b>Total</b>            | <b>69,463</b>  | <b>100.0</b>     | <b>75,000</b> | <b>100.0</b>     | <b>5,537</b> | <b>8.0</b>     |

|                    |        |      |        |      |       |       |
|--------------------|--------|------|--------|------|-------|-------|
| Gross income       | 17,313 | 24.9 | 17,692 | 23.6 | 379   | 2.2   |
| SG&A expenses      | 13,289 | 19.1 | 12,692 | 16.9 | △ 597 | △ 4.5 |
| Operating income   | 4,024  | 5.8  | 5,000  | 6.7  | 976   | 24.3  |
| Ordinary income    | 3,822  | 5.5  | 4,200  | 5.6  | 378   | 9.9   |
| Net income         | 2,162  | 3.1  | 3,000  | 4.0  | 838   | 38.8  |
| Capital Investment | 3,440  | -    | 8,000  | -    | 4,560 | 132.6 |
| Depreciation       | 4,303  | -    | 4,500  | -    | 197   | 4.6   |

# Business performance ( FY3/17 1st half vs. 2nd half )



| ¥ in millions           | FY3/17 1 <sup>st</sup> half |                  | FY3/17 2 <sup>nd</sup> half |                  |              |                |
|-------------------------|-----------------------------|------------------|-----------------------------|------------------|--------------|----------------|
|                         | Amount                      | Pct. Of Sales(%) | Amount                      | Pct. Of Sales(%) | Amount       | Pct. change(%) |
| Equipment-related       | 15,430                      | 41.7             | 16,220                      | 42.7             | 790          | 5.2            |
| Vacuum Feedthroughs     | 3,750                       | 10.1             | 3,650                       | 9.6              | △ 100        | △ 2.7          |
| Quartz                  | 3,950                       | 10.7             | 3,900                       | 10.3             | △ 50         | △ 1.3          |
| Ceramics                | 2,700                       | 7.3              | 2,700                       | 7.1              | 0            | 0.0            |
| CVD-SiC                 | 1,380                       | 3.7              | 1,620                       | 4.3              | 240          | 17.4           |
| EB-Gun, LED             | 1,800                       | 4.9              | 2,200                       | 5.8              | 400          | 22.2           |
| Semiconductor wafer     | 1,850                       | 5.0              | 2,150                       | 5.7              | 300          | 16.2           |
| Electronic device       | 5,990                       | 16.2             | 6,210                       | 16.3             | 220          | 3.6            |
| Thermo-electric module  | 5,640                       | 15.2             | 5,860                       | 15.4             | 220          | 3.9            |
| Ferrofluid, others      | 350                         | 0.9              | 350                         | 0.9              | 0            | 0.0            |
| Photovoltaic-related    | 12,130                      | 32.8             | 11,420                      | 30.0             | △ 710        | △ 5.9          |
| Quartz crucibles        | 1,540                       | 4.2              | 1,960                       | 5.2              | 420          | 27.1           |
| Solar silicon           | 6,090                       | 16.5             | 5,910                       | 15.6             | △ 180        | △ 3.0          |
| PV manufacturing Equip. | 800                         | 2.2              | 0                           | -                | △ 800        | -              |
| Solar cell, Others      | 3,700                       | 10.0             | 3,550                       | 9.3              | △ 150        | △ 4.1          |
| Others                  | 3,450                       | 9.3              | 4,150                       | 10.9             | 700          | 20.3           |
| <b>Total</b>            | <b>37,000</b>               | <b>100.0</b>     | <b>38,000</b>               | <b>100.0</b>     | <b>1,000</b> | <b>2.7</b>     |

|                          |       |      |       |      |     |      |
|--------------------------|-------|------|-------|------|-----|------|
| <b>Gross income</b>      | 8,702 | 23.5 | 8,990 | 23.7 | 288 | 3.3  |
| <b>SG&amp;A expenses</b> | 6,332 | 17.1 | 6,360 | 16.7 | 28  | 0.4  |
| <b>Operating income</b>  | 2,370 | 6.4  | 2,630 | 6.9  | 260 | 11.0 |
| <b>Ordinary income</b>   | 1,745 | 4.7  | 2,455 | 6.5  | 710 | 40.7 |
| <b>Net income</b>        | 1,250 | 3.4  | 1,750 | 4.6  | 500 | 40.0 |

※Net income=Net income attributable to owners of parent