

**Securities ID code:6859**

# **ESPEC CORP.**

**Results Briefings for  
Fiscal 2016 Ended March 2017**

**May 22, 2017**

**[www.espec.co.jp](http://www.espec.co.jp)**

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**Reference**

# Company Profile

Industry-leading manufacturer of environmental test chambers:  
70th year since company was founded

<b>Name</b>	<b>ESPEC CORP.</b>
<b>Head Office</b>	<b>3-5-6, Tenjinbashi, Kita-ku, Osaka</b>
<b>Represented By</b>	<b>Masaaki Ishida</b>
<b>Established</b>	<b>July 25, 1947</b>
<b>Incorporated</b>	<b>January 13, 1954</b>
<b>Paid-up Capital</b>	<b>¥6,895 Million</b>
<b>Shares Issued</b>	<b>23,781,394 Shares</b>
<b>Employees</b>	<b>1,426 (consolidated)</b>
<b>Main Business</b>	<b>Manufacture and Sales of Environmental Test Chambers, Energy Device Equipment, Semiconductor Equipment and Plant Factory. After-sales Service, Commissioned Tests and others.</b>



Head office

**Share of Environmental  
Test Chambers:**

**Over 30% worldwide, Over 60% domestic**

# Global Network

**Consolidated Subsidiaries**  
**11 companies**  
(Global 8 companies,  
Domestic 3 companies)

**Global Network**  
**43 countries**  
**33 companies**

**Business Facilities in Japan : 25**  
**Domestic Agencies in Japan : 46**

## EUROPE

△ ESPEC EUROPE GmbH  
△ ESPEC IKLIM KABINLERI  
SATIS VE MUHENDISLIK  
LIMITED SIRKETI

ESPEC CORP.  
● ESPEC TEST SYSTEM CORP.  
● ESPEC KYUSHU CORP.  
● ESPEC MIC CORP.  
△ MIC FARM OHGUCHI CORP.

## JAPAN

## ASIA

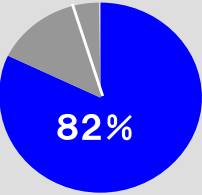
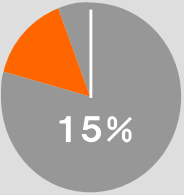
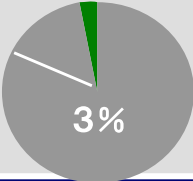
● SHANGHAI ESPEC ENVIRONMENTAL  
EQUIPMENT CORP.  
● ESPEC ENVIRONMENTAL EQUIPMENT  
(SHANGHAI) CO., LTD.  
● ESPEC TEST EQUIPMENT (GUANGDONG) CO., LTD.  
● ESPEC TEST TECHNOLOGY (SHANGHAI) CO., LTD.  
● ESPEC (CHINA) LIMITED  
● ESPEC KOREA CORP.  
△ ESPEC ENGINEERING(THAILAND)CO.,LTD

## U.S.A.

● ESPEC NORTH AMERICA, INC  
● QUALMARK CORPORATION

●: Consolidated Subsidiaries  
△: Non-consolidated Subsidiaries

# Summary of ESPEC Business (Per Market / Use)

		Main Products	Market	Use	Sales composition (FY2016)
Equipment Business	Environmental Test Chambers	<ul style="list-style-type: none"> <li>• Temperature &amp; humidity chamber</li> <li>• Thermal shock chamber</li> <li>• Bench-top type temperature &amp; humidity chamber</li> <li>• HAST chamber</li> <li>• Walk-in type temperature &amp; humidity chamber</li> <li>• Combined temperature &amp; humidity chamber</li> <li>• FPD equipment</li> </ul>	<ul style="list-style-type: none"> <li>• Electronic component and equipment market</li> <li>• Automobile market</li> <li>• Semiconductor market</li> <li>• Medicine, Cosmetics, Foods market</li> <li>• LCD and Organic Electro-Luminescence market</li> </ul>	<ul style="list-style-type: none"> <li>• For R &amp; D</li> <li>• For credibility and evaluation</li> <li>• For production and inspection</li> </ul>	 <p>82%</p>
	Energy Device Equipment	<ul style="list-style-type: none"> <li>• Charge-discharge Cycle Evaluation Equipment</li> <li>• LIB safety evaluation system</li> <li>• Fuel cells evaluation system</li> </ul>	<ul style="list-style-type: none"> <li>• Next generation automobile</li> <li>• Secondary batteries</li> <li>• Fuel cells</li> </ul>	<ul style="list-style-type: none"> <li>• For R &amp; D</li> <li>• For credibility and evaluation</li> <li>• Safety evaluation</li> <li>• For production</li> </ul>	
	Semiconductor Equipment	<ul style="list-style-type: none"> <li>• Burn-in system</li> <li>• Semiconductor evaluation system</li> <li>• Instrumentation system</li> </ul>	<ul style="list-style-type: none"> <li>• Semiconductor market</li> <li>• Automobile market</li> </ul>	<ul style="list-style-type: none"> <li>• For production and inspection</li> <li>• For development and evaluation</li> </ul>	
Service Business	After-sales Service and Engineering	<ul style="list-style-type: none"> <li>• After-sales service</li> <li>• Construction around equipment</li> </ul>	<ul style="list-style-type: none"> <li>• Electronic component and equipment market</li> <li>• Automobile market</li> <li>• Semiconductor market</li> </ul>	—	 <p>15%</p>
	Commissioned Tests and Facility Rentals	<ul style="list-style-type: none"> <li>• Commissioned test</li> <li>• Equipment rental</li> <li>• Resale</li> <li>• Calibration</li> </ul>		<ul style="list-style-type: none"> <li>• For R &amp; D</li> <li>• For credibility and evaluation</li> </ul>	
Other Business	Environmental Engineering Business	Reforestation (Tree planting), Waterfront biotope restoration, urban greening			 <p>3%</p>
	New Business	Plant factory, developing and creating new businesses as a major source of profit			

# TOPICS

(in January 2017)

**Nikkei Inc.**  
Achieved 38th place in the Nikkei  
Environmental Management Survey

FY	Ranking
2016	38
2015	48
2014	113

(in February 2017)

**Environmental Communication Award**  
Won the Excellence Award for  
2 consecutive years



※Sponsored by the Ministry of the Environment,  
and the Global Environmental Forum

## Promotion of diversity – Initiatives to promote women's success



- February 2016 – From the Ministry of Health, Labor and Welfare:  
The Company received the "Kurumin" certification, which is granted to companies that support child-rearing
- March 2016 – From Osaka City:  
The Company received the "Leading Company in Women's Advancement in Osaka City" certification
- September 2016 – From the Ministry of Health, Labour and Welfare:  
The Company received the highest ranking of the certification mark "Eruboshi" based on the Act on Promotion of Women's Participation and Advancement in the Workplace



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# **Financial Result for the Fiscal 2016 Ended March 31, 2017**



# Review of the Fiscal 2016

## External Environment

- Significant fluctuation in foreign exchange during the fiscal year
- Accelerated development of eco-friendly cars such as electric vehicles and fuel-cell vehicles following stricter environmental regulations  
Entry into force of ECE R100-2, Part II, the United Nations standard on the safety of automotive rechargeable batteries: July 2016
- Accelerated development of autonomous driving technology
- Development of cutting-edge technologies such as IoT and AI

## Developments within ESPEC

- Effectively started a “ONE ESPEC Structure” in the Chinese market  
(July 2015 Converted SHANGHAI ESPEC ENVIRONMENTAL EQUIPMENT CORP. into a wholly owned subsidiary)
- Converted QUALMARK CORPORATION of North America into a consolidated subsidiary (December 2015)  
In January 2017, started selling test equipment as a Japanese import agency
- Started full-fledged operation of Battery Safety Certification Center in Utsunomiya (Opened the September 2015)

\*First-half results were lower than the initial target, so in October 2016 the Company announced the downward revision of financial forecasts for the first half and full year, along with reducing its dividend forecast.

# Financial Highlights

Year-on-year product mix changes resulted in higher sales but lower earnings.

Both net sales and operating income increased against the revised plans.

	Year on Year	Against the revised plan	Initial plan
■ Orders-Received	○ Increased in the Equipment Business and Service Business segments	○ Increased due to the relaxation of customer's restrained investments associated with corrections in the yen's appreciation	○
■ Net sales	○ Especially increased in the Equipment Business of the semiconductor equipment	○ Increased because an increase in orders-received and an order backlog at overseas subsidiaries resulted in better-than-anticipated sales	○
■ Operating income	× Decreased due to the deterioration in the cost of sales ratio associated with product mix changes.	○ The deteriorating cost ratio of overseas subsidiaries and other factors resulted in only a slight increase	×
■ Ordinary income, Net income*	× Decreased due to the decrease in operating income	○ Increased due to the increase in operating income	×

■ The yen's appreciation had a negative impact of ¥1.33 billion and ¥0.16 billion on net sales and operating income, respectively, on a year-on-year basis.

■ Looking at dividends per share, the interim dividend was set at ¥12 as initially planned while the year-end dividend is forecast at ¥24 per share, up ¥4 from the revised forecast; accordingly, the annual dividend is forecast at ¥36 per share.

※Profit attributable to owners of parent

# Summary of Profits and Losses

(millions of yen)

	FY 2015	FY 2016 Revised Plan	FY 2016	Year on Year	Against the revised plan
Orders-Received	39,903	39,000	40,289	1.0%	3.3%
Net sales	39,035	38,000	39,507	1.2%	4.0%
Cost of Net Sales (Cost of sales ratio)	25,461 (65.2%)	24,847 (65.4%)	26,059 (66.0%)	2.3%	4.9%
Gross profit	13,573	13,153	13,447	Δ0.9%	2.2%
SG & A	10,051	10,153	10,204	1.5%	0.5%
Operating income	3,521	3,000	3,243	Δ7.9%	8.1%
Ordinary income	3,570	2,850	3,171	Δ11.2%	11.3%
Profit attributable to owners of parent	2,410	2,000	2,233	Δ7.3%	11.7%

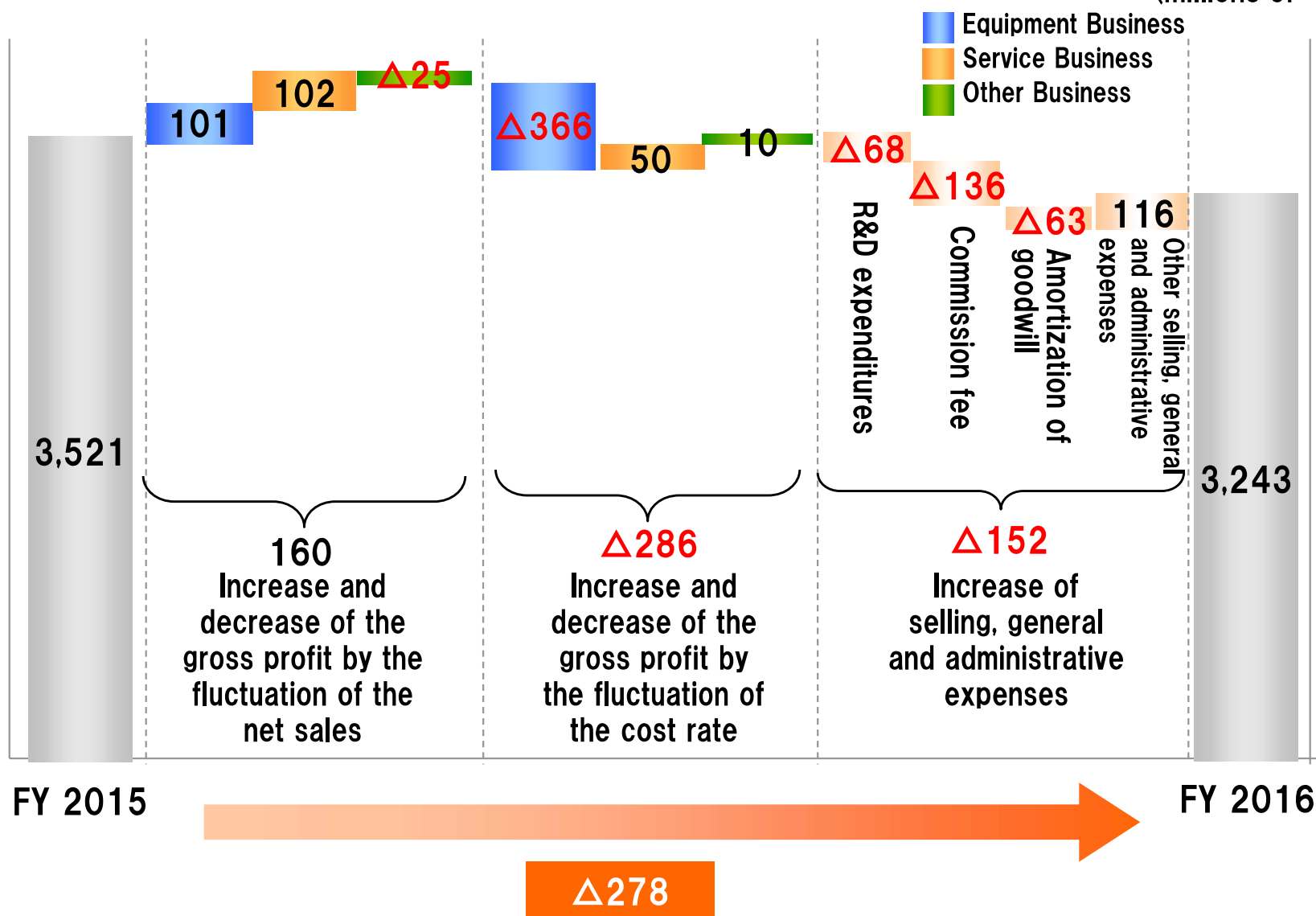
# Performance by Segment

(millions of yen)

Segment		FY 2015	FY 2016 Revised Plan	FY 2016	Year on Year	Against the revised plan
Equipment Business	Orders- Received	32,951	32,060	33,124	0.5%	3.3%
	Net Sales	32,030	30,910	32,334	0.9%	4.6%
	Operating Income	2,986	2,500	2,630	△11.9%	5.2%
Service Business	Orders- Received	5,874	5,910	6,096	3.8%	3.1%
	Net Sales	5,786	5,950	6,065	4.8%	1.9%
	Operating Income	516	500	594	15.1%	18.8%
Other Business	Orders- Received	1,340	1,230	1,331	△0.7%	8.2%
	Net Sales	1,474	1,340	1,378	△6.6%	2.8%
	Operating Income	19	0	18	△3.9%	—
Elimination	Orders- Received	△263	△200	△264	—	—
	Net Sales	△256	△200	△270	—	—
	Operating Income	0	0	0	—	—
Total	Orders- Received	39,903	39,000	40,289	1.0%	3.3%
	Net Sales	39,035	38,000	39,507	1.2%	4.0%
	Operating Income	3,521	3,000	3,243	△7.9%	8.1%

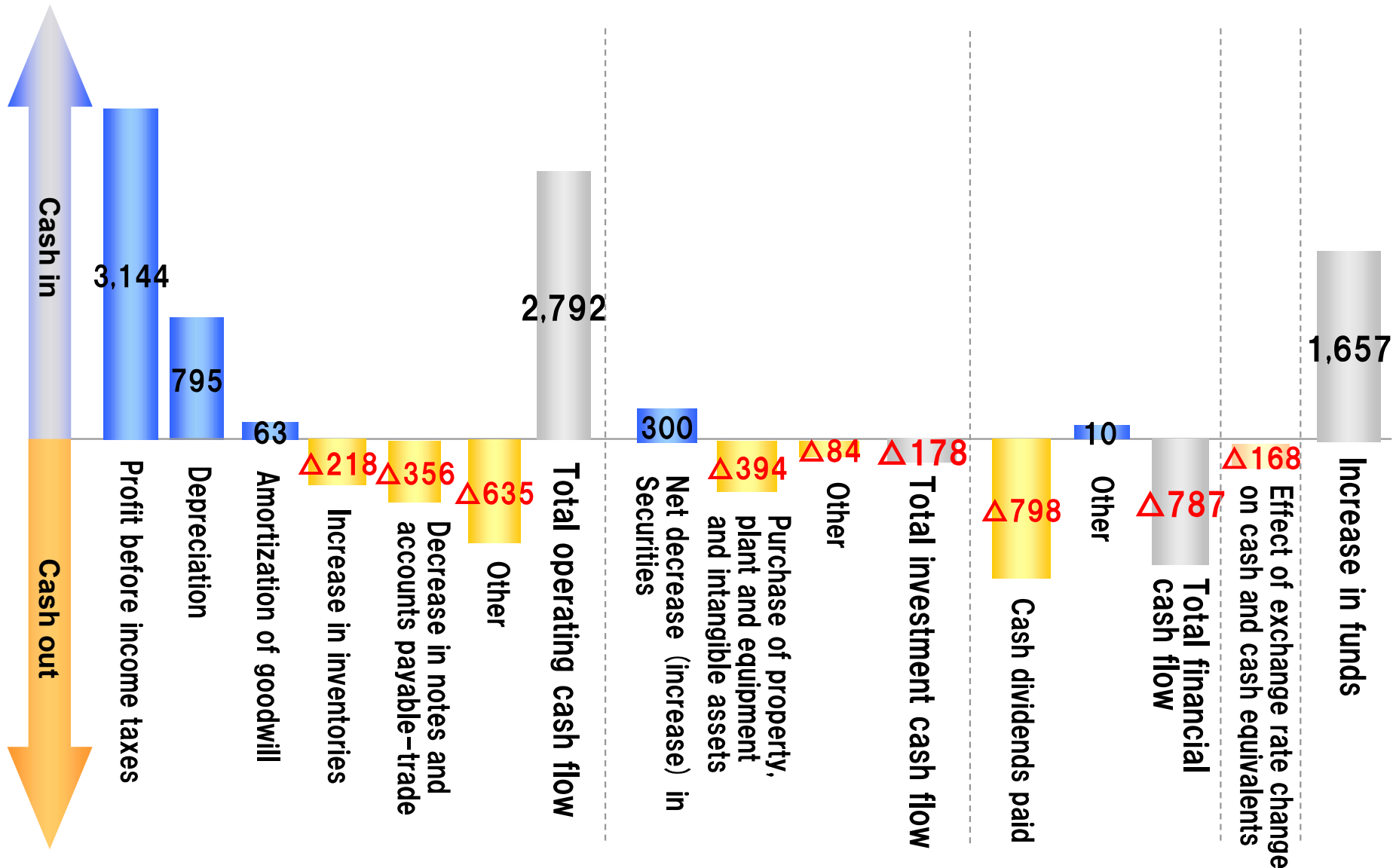
# Analysis of Operating Income Increase and Decrease Factor

(millions of yen)



# Statement of Cash Flow

(millions of yen)



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# **Analysis per Segment for the Fiscal 2016 Ended March 31, 2017**

# Equipment Business

## Environmental Test Chambers

- Both orders-received and net sales increased year on year

Increased due to export of customized products and QUALMARK CORPORATION's new consolidation

- Both orders-received and net sales increased against revised plans

Orders-received exceeded especially because standardized products increased more than anticipated due to corrections of the yen's appreciation,

Net sales exceeded because the increase in orders-received and the orders backlog at overseas subsidiaries were higher than anticipated

## Energy Device Equipment

- Orders-received increased year-on-year, net sales were about the same as the previous fiscal year, orders-received increased against the revised plans, and net sales were about the same as the plans. Fuel cell evaluation system and a subsidiary's inspection equipment for in-vehicle secondary batteries performed strongly

## Semiconductor Equipment

- Both orders-received and sales increased year on year and increased against revised plans

Strong performance centered on semiconductor equipment for the automotive sector.



# Equipment Business

(millions of yen)

	FY 2015	FY 2016 Revised Plan	FY 2016	Year on Year	Against the revised plan
Orders-Received	32,951	32,060	33,124	0.5%	3.3%
Net Sales	32,030	30,910	32,334	0.9%	4.6%
Operating Income [Profit ratio (%) ]	2,986 [9.3%]	2,500 [8.1%]	2,630 [8.1%]	Δ11.9%	5.2%

# Service Business

(millions of yen)

	FY 2015	FY 2016 Revised Plan	FY 2016	Year on Year	Against the revised plan
Orders-Received	5,874	5,910	6,096	3.8%	3.1%
Net Sales	5,786	5,950	6,065	4.8%	1.9%
Operating Income [Profit ratio (%) ]	516 [8.9%]	500 [8.4%]	594 [9.8%]	15.1%	18.8%

## After-sales Service and Engineering

■ No significant increase or decrease year on year or against the revised plans

## Commissioned Tests and Facility Rentals

■ Test consulting, especially for the automobile markets such as Battery Safety Certification Center, performed strongly year on year. Both orders-received and net sales increased, along with no significant increase or decrease against the revised plans

# Other Business

(millions of yen)

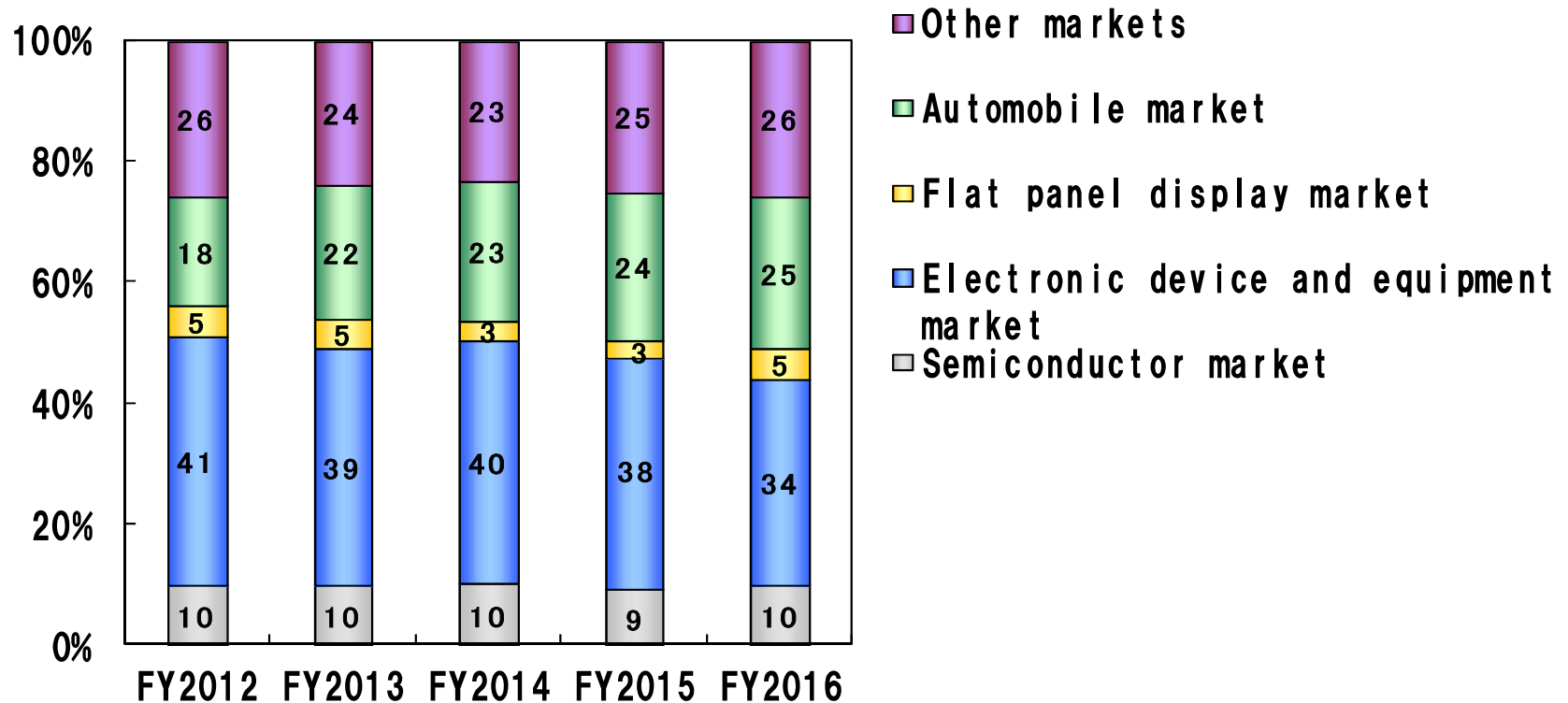
	FY 2015	FY 2016 (Revised Plan)	FY 2016	Year on Year	Against the revised plan
Orders-Received	1,340	1,230	1,331	Δ0.7%	8.2%
Net Sales	1,474	1,340	1,378	Δ6.6%	2.8%
Operating Income [Profit ratio (%) ]	19 [1.3%]	0 [—]	18 [1.3%]	Δ3.9%	—

## Environmental Engineering and Plant Factory

- The plant factory business and the reforestation (tree planting) business were sluggish, with orders-received, net sales, and operating income all decreasing year on year.
- Against the revised plans, plant factories and waterside projects performed strongly, and both orders-received and net sales exceeded expectations.

# Breakdown of Sales by Market

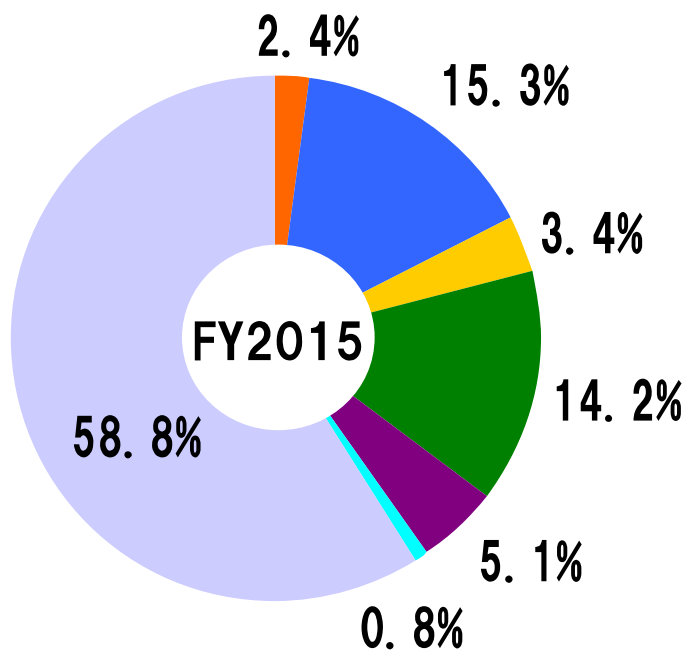
## Non-consolidated (Equipment business)



# Sales by Region

FY 2015

Overseas sales ratio: 41.2%

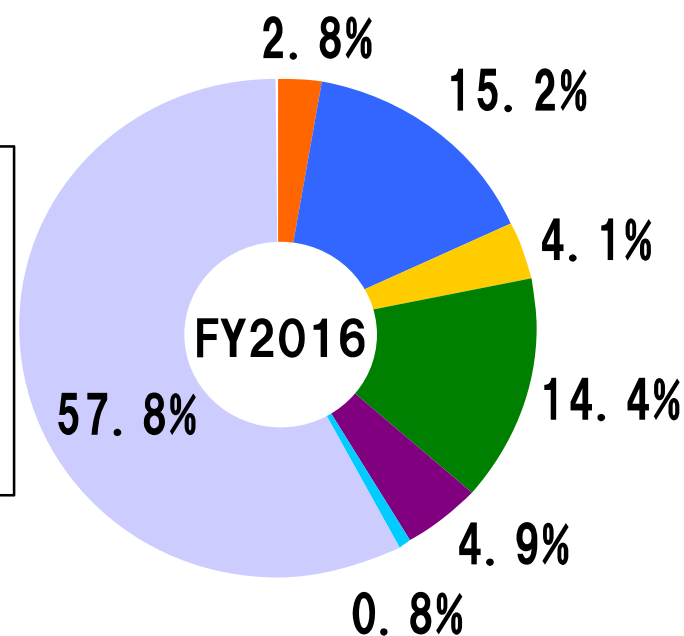


Total: 39,035million yen

(Overseas sales: 16,072 million yen)

FY 2016

Overseas sales ratio: 42.2%



Total: 39,507million yen

(Overseas sales: 16,663million yen)

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**Management Plan  
for the Fiscal Ending March 31, 2018**

# FY 2017 Awareness of the Environment

Equipment Business	Environmental Test Chambers	◎	Strong investment sentiment in the automobile market, both in Japan and overseas based on ongoing computerization, use of electronic components and development of automated driving.
		○	Firm demand in Japan and overseas in the smartphone market, supported by the development of next-generation smartphones.
		△	In Japan, there are concerns about an investment slowdown
		△	Overseas, conditions in North America and China are steady, in Europe they are uncertain
	Energy Device Equipment	△	In secondary batteries, the market is growing but will subsequently struggle
		○	Demand for fuel cells is firm, based on ongoing development of fuel cell vehicles.
	Semiconductor Equipment	○	Firm demand for semiconductors centered on the automotive sector.
Service Business	Semiconductor Equipment, Commissioned Tests and Facility Rentals	○	Demand in the after-sales service and engineering field should remain about the same as last year. Firm demand for commissioned tests centered on the automobile market.
Other Business	Environmental Engineering Business, Plant factory	△	The plant factory business and solid demand for waterfront biotope restoration, despite sluggish demand for and the reforestation (tree planting) business.

# FY 2017 Assumed exchange rate

## ■ Assumed exchange rate

	FY 2015	FY 2016		FY 2017
	Results	First half Results	Results	Assumed
US\$(yen)	121.11	111.74	108.81	110.00

### Reference. FY 2017 Exchange rate sensitivity

(for every appreciation of ¥1 against the U.S. dollar)

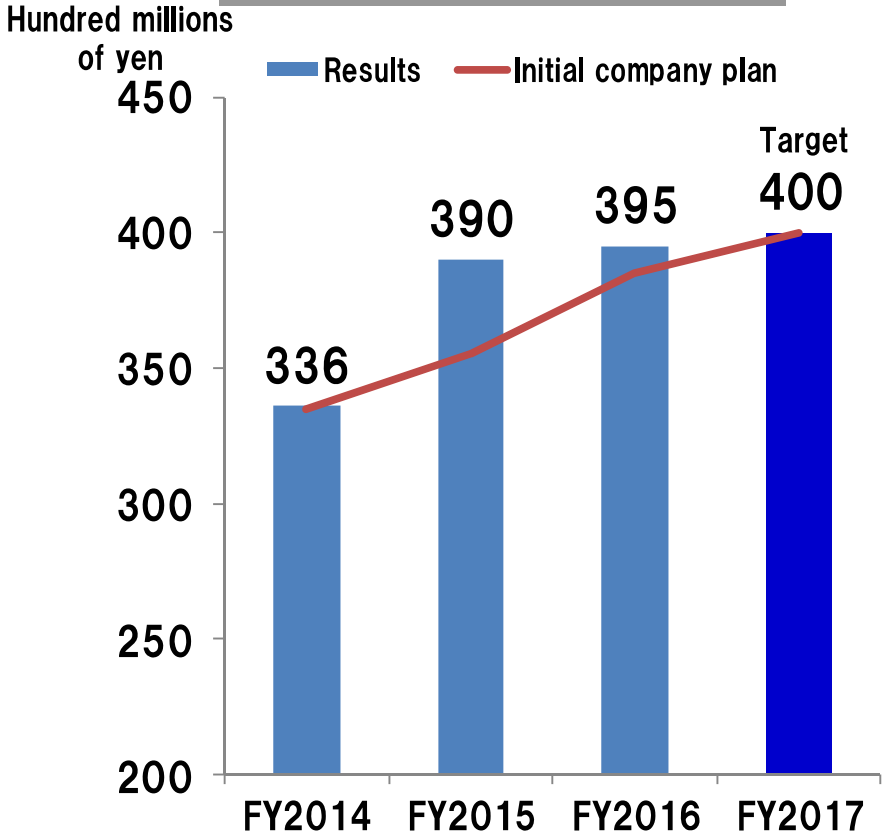
Net Sales                      A decrease of ¥123 million  
Operating Income              A decrease of ¥1,500 thousand



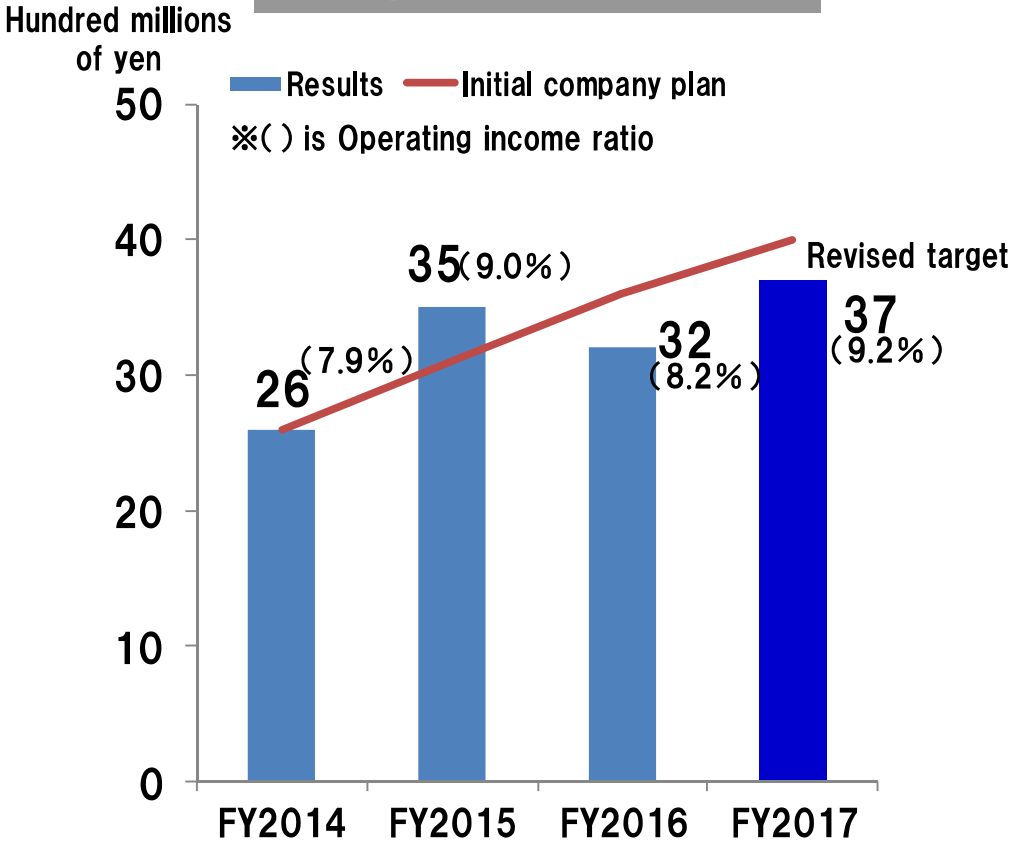
# Progress of Medium-Term Management Plan and Targets for the Fiscal Ending March 31, 2018

For FY2017, made downward revision of operating income from 4 billion yen to 3.7 billion yen

**Net sales**



**Operating income**



# Business Plan for the Fiscal Ending March 31, 2018

(millions of yen)

	FY 2016	FY 2017			
	Results	Plan			
		First half	Second half	Full Year	Year on Year (%)
Orders-received	40,289	20,000	20,500	40,500	0.5%
Net sales	39,507	17,500	22,500	40,000	1.2%
Gross profit [Profit ratio (%) ]	13,447 [34.0%]	6,200 [35.4%]	7,950 [35.3%]	14,150 [35.4%]	5.2%
Operating income (loss) [Profit ratio (%) ]	3,243 [8.2%]	1,200 [6.9%]	2,500 [11.1%]	3,700 [9.2%]	14.1%
Ordinary income (loss) [Profit ratio (%) ]	3,171 [8.0%]	1,250 [7.1%]	2,550 [11.3%]	3,800 [9.5%]	19.8%
Profit attributable to owners of parent [Profit ratio (%) ]	2,233 [5.7%]	850 [4.9%]	1,850 [8.2%]	2,700 [6.8%]	20.9%
Capital expenditures	655	420	300	720	9.9%
Depreciation expenses	789	412	413	825	4.6%
R&D expenditures	1,025	600	525	1,125	9.8%
Profit Per Share (yen)	97.85	37.19	80.94	118.13	20.7%

# Equipment Business

(millions of yen)

	FY 2016	FY 2017			
	Results	Plan			
		First half	Second half	Full Year	Year on Year (%)
Orders-received	33,124	16,500	16,800	33,300	0.5%
Net sales	32,334	14,300	18,500	32,800	1.4%
Operating income [Profit ratio (%) ]	2,630 [8.1%]	1,050 [7.3%]	2,000 [10.8%]	3,050 [9.3%]	16.0%

# Service Business

(millions of yen)

	FY 2016	FY 2017			
	Results	Plan			
		First half	Second half	Full Year	Year on Year (%)
Orders-received	6,096	3,000	3,200	6,200	1.7%
Net sales	6,065	2,800	3,400	6,200	2.2%
Operating income [Profit ratio (%) ]	594 [9.8%]	200 [7.1%]	450 [13.2%]	650 [10.5%]	9.4%

# Other Business

(millions of yen)

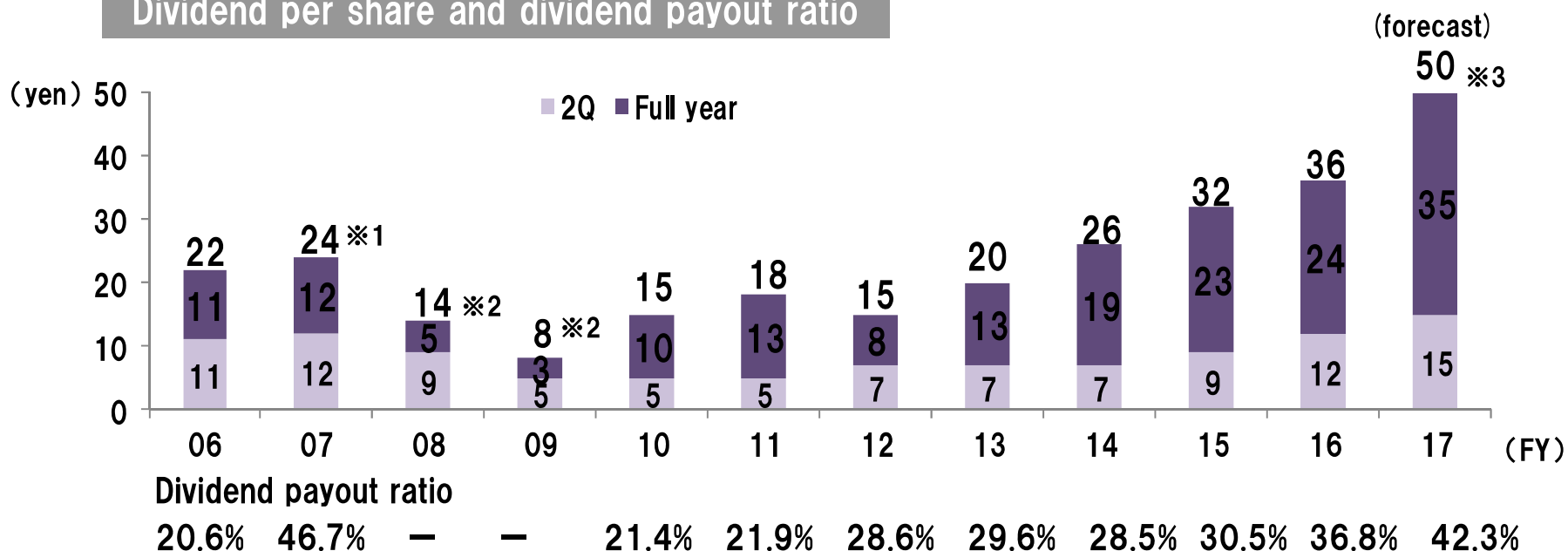
	FY 2016	FY 2017			
	Results	Plan			
		First half	Second half	Full Year	Year on Year (%)
Orders-received	1,331	600	700	1,300	Δ2.3%
Net sales	1,378	500	800	1,300	Δ5.7%
Operating income [Profit ratio (%) ]	18 [1.3%]	Δ50 [Δ10.0%]	50 [6.3%]	0 [—]	—

# Dividends

## Dividend policy

Recognizing that passing on profits to our shareholders is a key priority and that raising corporate value on a lasting basis is fundamental to raising shareholder value, dividends are decided taking into account sustainability and the dividend payout ratio.

## Dividend per share and dividend payout ratio



※1.The dividend per share for FY2007 included a commemorative dividend of ¥2 per share to mark the Company's 60<sup>th</sup> founding anniversary.

※2.Dividends were implemented in FY2008 and FY2009, despite posting a net loss.

※3.The dividend per share for FY2017 includes a commemorative dividend of ¥2 per share to mark the Company's 70<sup>th</sup> founding anniversary (an interim dividend of ¥1 per share and a year-end dividend of ¥1 per share).

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**Action Items  
for the Fiscal Ending March 31, 2018**

# Priority Strategies for the Fiscal Ending March 31, 2018

## Priority Strategy 1

**Implement Company-wide quality and process reforms focusing on design and production reforms for customized division products**

## Priority Strategy 2

**Apply synergies of the ESPEC Group to expand in overseas markets**

## Priority Strategy 3

**Expand business domains targeting growing and strategic markets, and promote activities to create new businesses**

## Priority Strategy 4

**Take the lead by applying competitive strategies in the Japanese environmental testing market**



# 1 Design and production reforms for customized Division products

## Implement Reforms for All Processes

- Marketing : Strengthen quick response and promotion
- Design : Improvement of estimation accuracy, unitization and modularization
- Development : Advance development tailored to cutting-edge needs
- Procurement : Strict cost reduction
- Production : Promote advance production and in-house production



Actual vehicle test equipment for one car

### \*Customized Division products

- ① Customized products included in Environmental Test Chambers (Walk-In Type Temperature (& Humidity) Chamber, Customized Equipment, FPD Equipment)
- ② Energy Device Equipment
- ③ Semiconductor Equipment

# 2-1 Increase sales in overseas markets

## China

- Expansion of Shanghai Espec product sales
- Enhance customized response capabilities



## ASEAN and India

- Thai subsidiaries “Technical Support Functions”
- Sales promotion function in ASEAN and India
  - Expanding coverage



# 3-1 Expand business domains and create new business

## Automobile market

- Expansion of environmental test equipment sales  
(Standardized products and customized product)
- Increase sales of commissioned testing services



**Battery Safety Certification Center  
(in Utsunomiya Technocomplex )**

## 3-2 Expand business domains and create new business

### HALT/HASS Chamber

- Domestic sales expansion  
(In January 2017, started selling test equipment as a Japanese import agency)
- Utilizing the sales network of the ESPEC Group



HALT/HASS Chamber

### Life science market Drug, Food and Material

- Increase sales of Stability Test Chambers and Walk-In Stability Test Chambers
- Release of new products for food



Walk-in Stability Test Chamber

# 4 Take the lead in the Japanese environmental testing market

## Our proprietary products and services

- Expansion of sales by new products for automobile market
- Promotion of replacement by "product 5 year warranty"
- Expand after-sales service and engineering services such as maintenance inspections
- Expand rentals and resales

### ■New products for the automobile market

#### Environmental Stress Chamber Rapid temperature change type

Compatible with related standards of European and U.S. automobile manufacturers, and the international IEC standards.



### ■"5-year Product Guarantee" product



Temperature (& Humidity) Chamber  
Platinous J Series



Bench-Top Type  
Temperature (& Humidity) Chamber



Thermal Shock Chamber  
TSA Series

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Quality is more than a word

ESPEC

**These materials contain forward-looking statements, including the Company's present plans and forecasts of performance, that reflect the Company's plans and forecasts based on the information presently available. These forward-looking statements are not guarantees of future performance, and plans, forecasts, and performance are subject to change depending on future conditions and various other factors.**

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**Jyunko Nishitani (General Manager),**

**Natsuko Ookawa and Yui Ikeshima**

**Corporate Communication Department**

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# Reference



# History of Environmental Test

## What is Environmental Test

Test to analyze and evaluate effects of environmental factors such as temperature, humidity, pressure, and light on various industrial products like electronic components in order to ensure product quality.

<1950s>

The environmental test was JIS-standardized in Japan for consumer products.



<1970s-1990s>

"Reliability" and "quality control" became important issues in product development. Demand increased dramatically due to a rapid shift toward computerization and the use of electronic components.



<Today>

Demand is expanding in the energy field, and the development field of automobiles' electrification and automated driving functions.



1961 Japan's First Environmental Test Chamber



【 Low temperature & humidity chamber "Lucifer" 】



Over 60% domestic

Over 30% worldwide

To Worldwide Market Share No.1

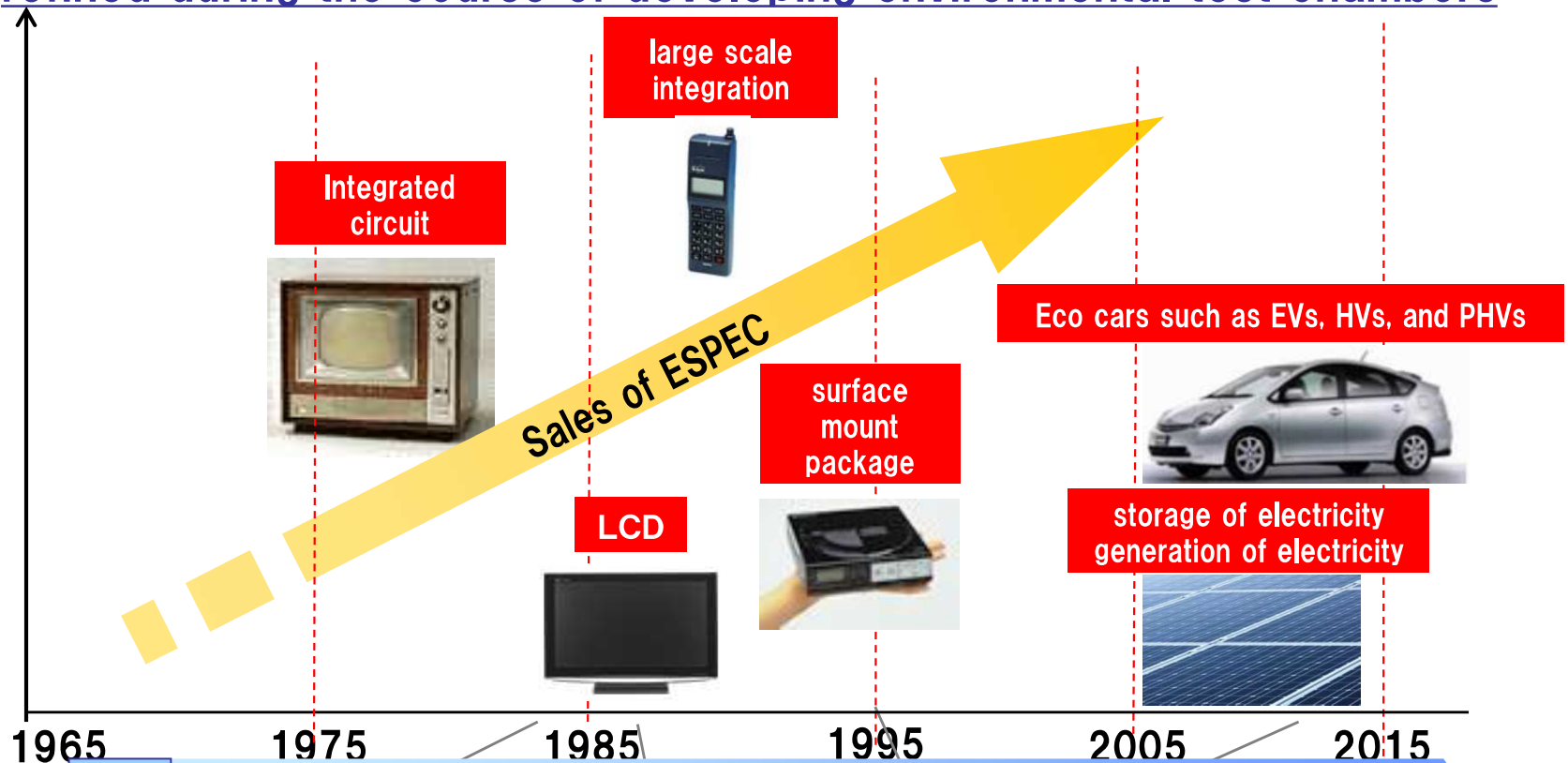


【 Temperature & Humidity Chamber 】

"Platinous J series"

# Transition in Business

Expanding business based on the “environmental creation technology” refined during the course of developing environmental test chambers



Business expansion

1982  
Launching the semiconductor equipment business



1986  
Launching the FPD Equipment business



1994  
Launching the evaluation system business

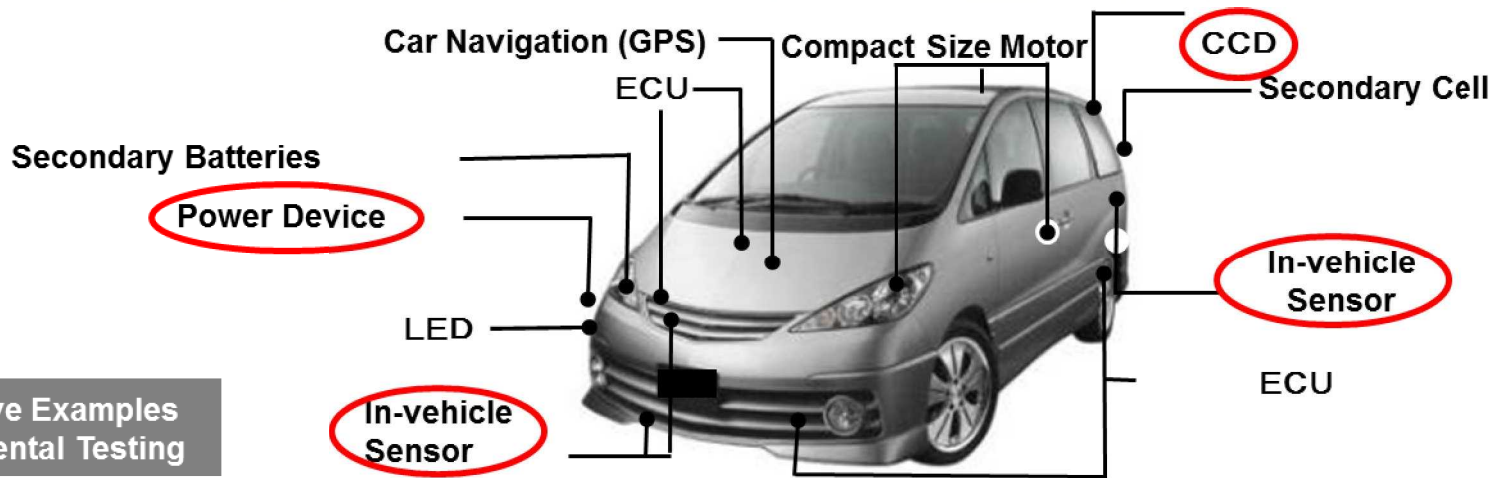


2011  
Launching the energy device equipment business






# [Equipment Business]

## Usage Case with Environmental Test Chambers



Representative Examples for Environmental Testing

Device	Process/Test Condition		Our Products
<b>【Power Device】</b> 	Inspection	■ Thermal shock test: $40^{\circ}\text{C} \Leftrightarrow +125^{\circ}\text{C}$	Thermal shock chamber
		■ High temperature exposure: $+175^{\circ}\text{C}$ , $+85^{\circ}\text{C}$	(Compact size) Oven
		■ Burn-in test	Burn-in chamber
<b>【In-vehicle Sensor】</b> 	Inspection	■ Temperature cycle test of printed circuit board: $-40^{\circ}\text{C} \Leftrightarrow +110^{\circ}\text{C}$	Temperature & humidity chamber (Platinous) /Oven
		■ Temperature characteristic test after soldering: Linear change between $-30^{\circ}\text{C}$ and $+85^{\circ}\text{C}$	Burn-in chamber, Rapid-rate thermal cycle chamber
	Evaluation	■ Thermal shock test : $-30^{\circ}\text{C} \Leftrightarrow \text{RT} \Leftrightarrow +80^{\circ}\text{C}$ , $-55^{\circ}\text{C} \Leftrightarrow +155^{\circ}\text{C}$	Thermal shock chamber
<b>【CCD/CMOS】</b> 	Production	■ Diffusion Test: $+150^{\circ}\text{C}$	Compact size Oven
		■ Drying after cleaning: $+85^{\circ}\text{C}$	Clean Oven
	Evaluation	■ Screening: $+85^{\circ}\text{C}$	Temperature chamber (Platinous) / Burn-in chamber
	Inspection	■ Temperature and humidity test: $+85^{\circ}\text{C}/+85\%\text{rh}$ , $+60^{\circ}\text{C}/90\%\text{rh}$	Temperature & humidity chamber (Platinous)
		■ Acceleration test: $+120^{\circ}\text{C}/100\%\text{rh}$	HAST chamber
	■ Thermal shock test : $-40^{\circ}\text{C} \Leftrightarrow +125^{\circ}\text{C}$ , $-20^{\circ}\text{C} \Leftrightarrow +85^{\circ}\text{C}$	Thermal shock chamber	

# [Equipment Business] Main New Products

Release Date	Name of product	Features
2016/11	High-Power Temperature & Humidity Chamber AR Series Rapid temperature change type	<ul style="list-style-type: none"> <li>•Compatible with IEC standards and automobile-related standards</li> <li>•Achieves rapid temperature change rate of up to 18° C/min</li> </ul>
2016/6	IPX9K-compatible testing equipment (High-pressure steam cleaning injection)	<ul style="list-style-type: none"> <li>•Evaluates the impact of high-pressure steam on electronic devices during cleaning of automobiles; meets ISO standards</li> </ul>
2016/6	Siloxane endurance testing equipment	<ul style="list-style-type: none"> <li>•Evaluates the impact on electronic devices of siloxane contained in resins and other materials, mainly in automobiles</li> </ul>
2016/4	Added new functions to Online Core, a communications network product	<ul style="list-style-type: none"> <li>•Central management system for equipment and peripheral devices (monitoring of operating condition, schedule management, etc.)</li> </ul>
2015/9	Constant-Temperature Bath for Combined Testing Equipment	Material evaluation testing of mainly plastics, rubbers, and fibers
2015/2	Low Temperature (&Humidity) Chamber	Preservation testing of foods Long-term refrigerated storage testing of pharmaceuticals and cosmetics
2014/11	Thermal Shock Chamber TSA series	Build in state-of-the-art controllers to improve operability
2014/11	Advanced Safety Tester	Conduct three types of safety testing of rechargeable batteries on one platform

# [Equipment Business] TOPICS

## Bench-Top Type Temperature (& Humidity) Chamber receives an iF DESIGN AWARD 2016 international design award

ESPEC's Bench-Top Type Temperature (& Humidity) Chamber received an iF DESIGN AWARD 2016, the most prestigious design award in the world, in the product design category.

This product is used in the R&D stage for primarily evaluating the reliability of electronic and automotive components. The product's unrivaled compact and highly functional design was praised around the world.



# [Equipment Business]

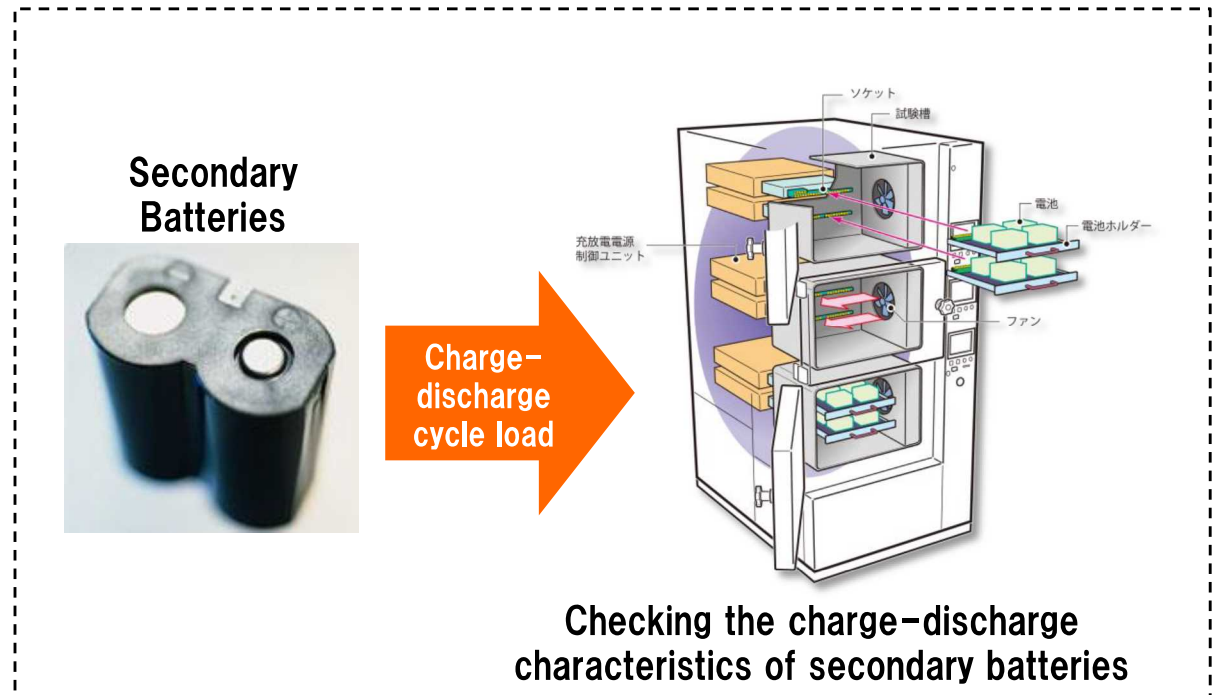
## Usage Case with Energy Device Equipment

### Charge-discharge Cycle Evaluation Equipment

Equipment for ensuring the reliability and safety of lithium-ion secondary batteries for next-generation vehicles (e.g., hybrid and electric vehicles)



Charge-discharge Cycle Evaluation Equipment



Evaluating the performance and life of secondary batteries



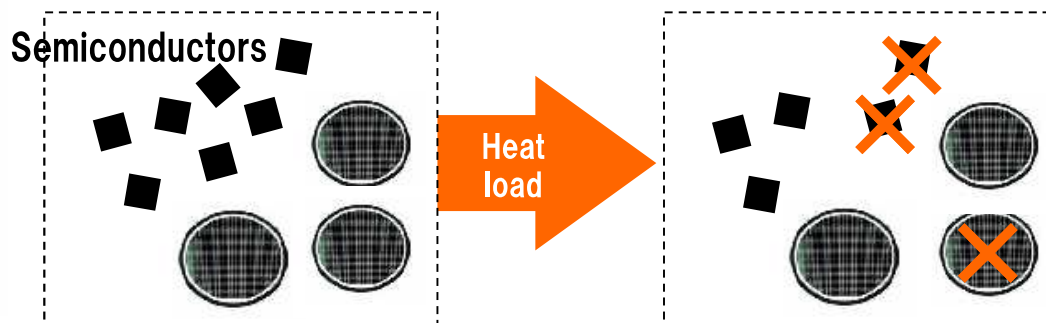
# [Equipment Business] Usage Case with Semiconductor Equipment

## Screening

Eliminate defective products to maintain initial-period quality at the final inspection stage of semiconductor device manufacturing



Burn-in chamber



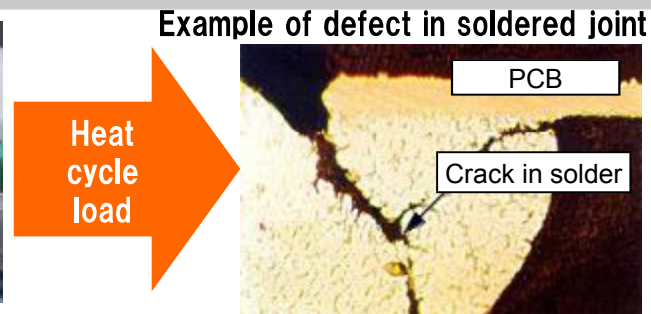
Elimination of latent early failures

## Reliability Evaluation

Used to evaluate basic failure patterns to ensure reliability in the development of new technologies



Conductor resistance evaluation system



Electrical evaluation of reliability of joints in electronic parts

# [Service Business]

## After-sales Service and Engineering

Preventive maintenance of products, maintenance service, and the upgrading/improvement and installation/relocation of products

- Speedy response via one of the most extensive networks in Japan
- Launching new services by utilizing the network function mounted in the equipment
- In overseas, established “Global Support Desk”, global framework, with distributors located in many countries

## Commissioned Tests and Facility Rentals

Commissioning of testing, analysis, and evaluation; consulting; equipment rental; sales of used products; calibration of test equipment, etc.

- The company has five commissioned test centers in Japan, two commissioned test centers in China. (In Japan, 2 point of Utsunomiya, Toyota, Kariya and Kobe. In China, Shanghai, Suzhou)
- These centers are IECQ-approved independent testing laboratories that meet ISO/IEC17025 standards.
- The centers are also recognized as official calibration facilities under the Japan Calibration Service System (JCSS).
- September 2015, Opened the world's first Battery Safety Certification Center.
  - Providing a one-stop service for testing and certification application services compliant with United Nations regulations on the safety of automotive rechargeable batteries.
  - Entered into business alliance with TÜV SÜD Japan Ltd., a third-party certification agency (October 2014)



Battery Safety Certification Center  
(in Utsunomiya Technocomplex)



# [Service Business] TOPICS

**ESPEC provides commissioned tests and certification application services compliant with United Nations regulations at the world's first Battery Safety Certification Center**

Providing a one-stop service to support the implementation of 9 safety tests and applications for certification by certification agencies, as stipulated by UN ECE R100-2. Part II※, a United Nations regulation.

(The facility was opened within the Utsunomiya Technocomplex in September 2015.)

※Entered into force in July 2016



**Battery Safety Certification Center  
(in Utsunomiya Technocomplex )**



**Crush Testing Equipment  
(No. 1 Safety Test Room)**



**No. 2 Safety Test Room**

# [Other Business]

## Environmental Engineering Business

### Environmental Engineering Business

#### ■ Reforestation (Tree planting)

Recovery of local forest by selecting species and planting out seedlings using potential natural vegetation data.

#### ■ Waterfront biotope restoration

Reconstruction of natural environment, development of vegetative revetments, and water quality improvement using aquatic plants.

#### ■ Urban greening

Provision of roof and wall greening systems that use moss to effectively alleviate heat island effect.



### Plant factory

Provision of various cultivation environments employing advanced environmental control technologies to control light, temperature, humidity, carbon dioxide, etc.



Container plant factory



Phyto-toron

# 【Other Business】 TOPICS

**Produced a high value-added vegetables using deep-seawater**

**Established in March 2016 near Haneda Airport at a plant factory※,  
Production and sales of vegetables high in minerals  
with the use of deep sea water.**

**※ Joint research with DHC Corporation and Kyoto University**



**Interior of the plant factory and Factory-produced vegetables”mineraleaf”**



# 【Other Business】 TOPICS

In recognition of their forestation activities, ESPEC MIC CORP., along with Rinno-ji Temple (Sendai), received the Award of the Chairman of the Organization for Landscape and Urban Green Infrastructure at the 36th Urban Green Awards\*.

This project involved restoring a row of cedar trees at Sotoshu Kongohozan Rinno-ji Temple (Sendai, Miyagi) that had been cut down for the construction of a tunnel. Over five years, more than 30,000 trees of around 60 different species were planted, thereby restoring a vibrant broadleaf forest.

\*Sponsored by the Organization for Landscape and Urban Green Infrastructure



Tree planting with local community residents



The trees have grown into a tall broadleaf forest (the approach to Rinno-ji Temple in Sendai)