

# Reference

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August 23, 2022

# Company Profile

## Industry-leading manufacturer of environmental test chambers

Name	ESPEC CORP.
Head Office	3-5-6, Tenjinbashi, Kita-ku, Osaka
Representative	Satoshi Arata
Established	July 25, 1947
Incorporated	January 13, 1954
Paid-up Capital	¥6,895 Million
Issued shares	23,781,394 Shares
Employees	1,628 (consolidated)
Main Business	Manufacture and Sales of Environmental Test Chambers, Energy Device Equipment, Semiconductor Equipment and Plant Factory. After-sales Service, Laboratory Testing Services and others.
Share of Environmental Test Chambers	Over 30% worldwide, Over 60% domestic



Head Office

Share of Environmental  
Test Chambers

\* Market shares are ESPEC estimates

(As of April 1, 2022)

# Global Network

## Consolidated Subsidiaries

13 companies

(Global 9 companies,  
Domestic 4 companies)

## Global Network

50 locations

45 companies

Business Facilities in Japan: 16  
Domestic Agencies in Japan: 46

### EUROPE

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

### JAPAN

- ESPEC CORP. \*
- ESPEC TEST SYSTEM CORP.
- ESPEC ASSIST CORP.
- ESPEC MIC CORP.
- ESPEC THERMAL TECH  
SYSTEM CORP.
- MIC FARM OHGUCHI CORP.

### 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
- ESPEC ENGINEERING VIETNAM CO., LTD.

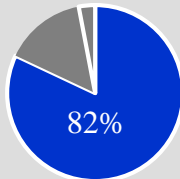
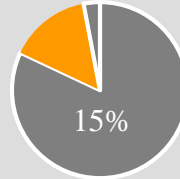
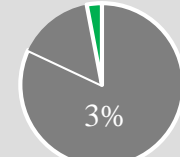
### U.S.A.

- ESPEC NORTH AMERICA, INC \*

● : Consolidated Subsidiaries  
- : Non-consolidated Subsidiaries

\* Denotes company with production functions.

# Summary of ESPEC Business (Per Market / Use)

		Main Products	Market	Use	Sales Composition (FY2021)
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>•HALT &amp; HASS test 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>•Pharmaceuticals, 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>	
	Energy Device Equipment	<ul style="list-style-type: none"><li>•LIB 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 market</li><li>•Secondary batteries market</li><li>•Fuel cells market</li></ul>	<ul style="list-style-type: none"><li>•For R &amp; D</li><li>•For credibility and evaluation</li><li>•For 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>•Measurement 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>	—	
	Laboratory Testing Services and Facility Rentals	<ul style="list-style-type: none"><li>•Laboratory testing services</li><li>•Equipment rental</li></ul> <ul style="list-style-type: none"><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 Preservation	Reforestation (Tree planting), Waterfront biotope restoration, Urban greening			
	Plant Production Systems	Plant factory, Equipment for growing plants			

# History of Environmental Test

## What is Environmental Test

Test to analyze and evaluate effects of environmental factors such as temperature, humidity, pressure, and vibration 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.



Present

Demand is expanding in the development fields of IoT and next-generation automobiles against the backdrop of digitalization and decarbonization.



**1961 Japan's First Environmental Test Chamber**



Low Temperature & Humidity Chamber  
"Lucifer"

**Worldwide Market Share No.1**



Over 60%  
domestic

Over 30%  
worldwide

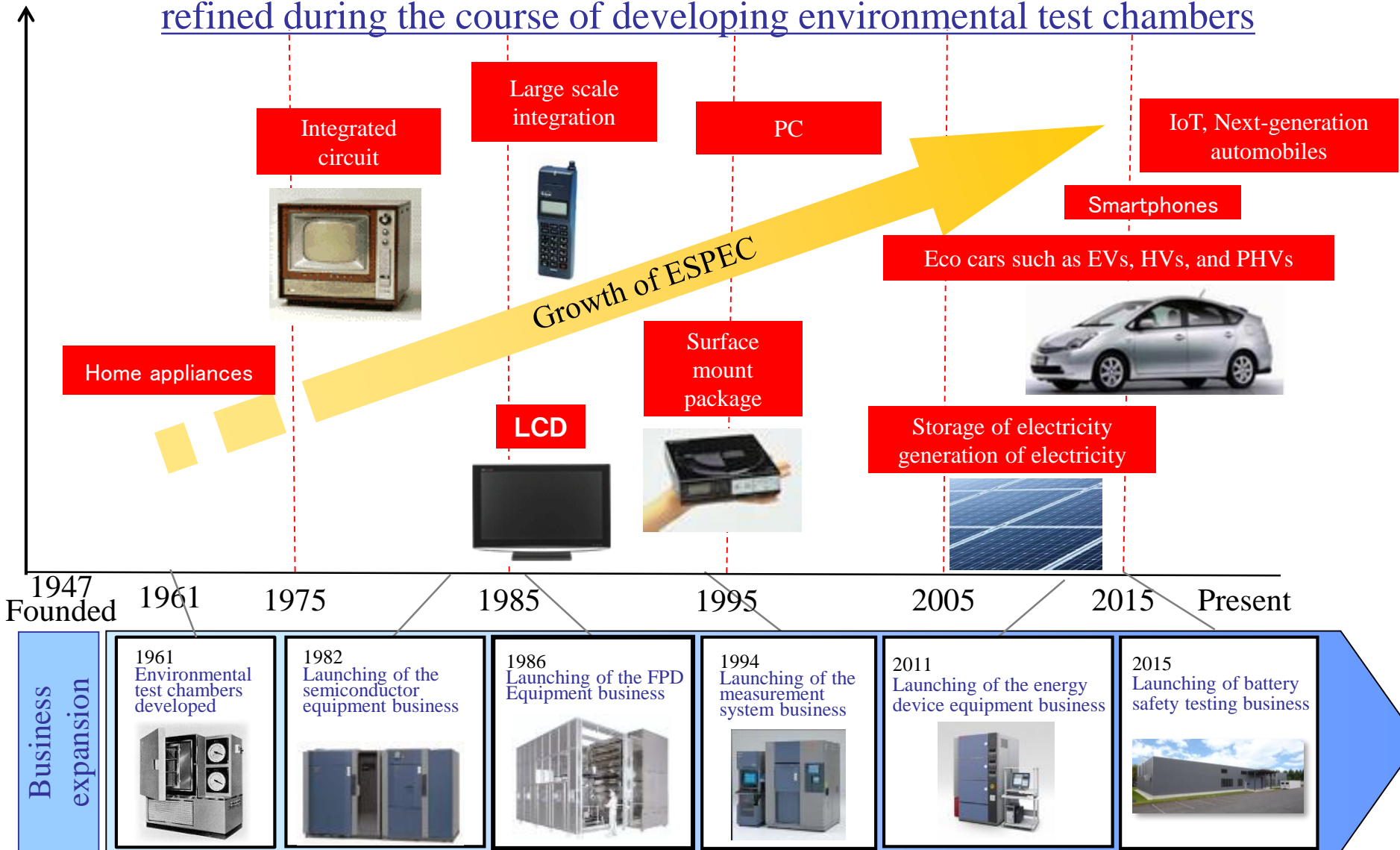


Temperature & Humidity Chamber  
"Platinous J series"

Consecutively selected as a winner of  
Ministry of Economy, Trade and Industry (METI)  
“Global Niche Top Companies Selection 100”

# Transition in Business

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



# ESPEC's Strengths

## Top Market Share

Share of Environmental Test Chambers:

Over 30% worldwide, Over 60% domestic (ESPEC estimates)

First in Japan to develop environmental test chambers, rapidly established a brand in Japan and overseas and have held the top market share for many years

## Technological Capabilities Product and Service Capabilities

- Developed a variety of products with high quality and meeting customer requirements

- Production technology capabilities that enable high-mix, low-volume production

- Total solutions for environmental tests, including products, laboratory testing services and technical support, and after-sales service capabilities

## Global Structure

Provide products globally that comply with the needs of respective countries through an extensive global network

Consolidated subsidiaries: 13 (9 overseas, 4 domestic)

Overseas production bases: North America 1 company,

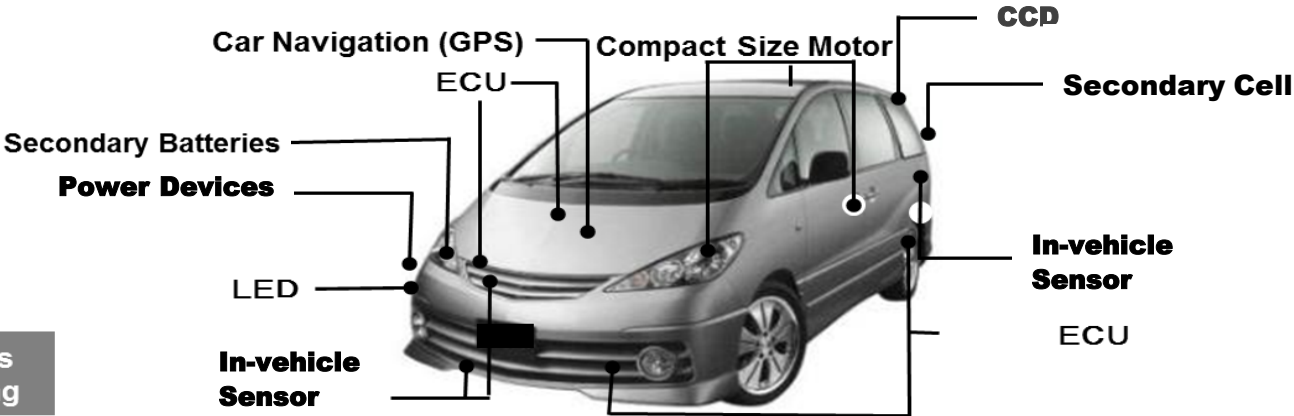
China 2 companies, South Korea 1 company

Overseas network: 50 locations (countries or territories),  
45 companies






# Equipment Business Usage Case with Environmental Test Chambers

Ensure reliability of new technologies and new products  
by repeatedly testing each component, module and finished product



Representative Examples  
for Environmental Testing

Device	Process/Test Condition		Our Products
<b>【Power Device】</b> 	Inspection	■ Thermal shock test: $-40^{\circ}\text{C} \rightleftharpoons +125^{\circ}\text{C}$	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: $-40^{\circ}\text{C} \rightleftharpoons +110^{\circ}\text{C}$	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 : $-30^{\circ}\text{C} \rightleftharpoons \text{RT} \rightleftharpoons +80^{\circ}\text{C}$ , $-55^{\circ}\text{C} \rightleftharpoons +155^{\circ}\text{C}$	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 : $-40^{\circ}\text{C} \rightleftharpoons +125^{\circ}\text{C}$ , $-20^{\circ}\text{C} \rightleftharpoons +85^{\circ}\text{C}$	Thermal shock chamber



# Equipment Business Main New Products

Release Date	Name of product	Features
Apr. 2022	Environmental Stress Chamber AR Series Featuring R-473A Low-GWP Refrigerant	<ul style="list-style-type: none"> <li>•Greatly reduces GWP values (an 88% reduction), and also enables energy conservation during operation</li> <li>*GWP: Global Warming Potential</li> </ul>
Jun. 2021	Ultra-Low-Temperature Freezers	<ul style="list-style-type: none"> <li>•Used for small lot storage to -75°C for items such as COVID-19 vaccines</li> </ul>
Apr. 2021	Freezer for Temperature Controlled Transport	<ul style="list-style-type: none"> <li>•Optimal for small-lot transport and storage of items such as COVID-19 vaccines</li> <li>•Vibration resistant, energy efficient and portable</li> </ul>
Feb. 2021	Vacuum Low-Temperature Heating Cooker – Model Change	<ul style="list-style-type: none"> <li>•Enables precise control of not only temperature but also the degree of vacuum</li> </ul>
Aug. 2020	Expanded Environmental Stress Chamber AR Series Lineup	<ul style="list-style-type: none"> <li>•Expanded the series with launch of four new models as rapid-rate temperature cycle type products, bringing the total lineup to 32 models across the series</li> </ul>
Mar. 2020	Transportation Evaluation System	<ul style="list-style-type: none"> <li>•Recreates transport environments for pharmaceuticals and medical devices</li> <li>•Applications in biopharmaceutical R&amp;D and medical equipment quality control</li> </ul>
Feb. 2020	Walk-In Type Temperature (& Humidity) Chamber for Drive-In Series	<ul style="list-style-type: none"> <li>•Recreates various weather environments in a large space accommodating two vehicles</li> </ul>
Feb. 2020	Walk-In Type Temperature (& Humidity) Chamber for High-Power Series	<ul style="list-style-type: none"> <li>•Compatible with international IEC standards and LV124 German Automotive Manufacturer Testing Standards</li> </ul>

# Equipment Business New Product Introduction (1)

(Released in Feb. 2020)

## ■ Walk-In Type Temperature (& Humidity) Chamber for High-Power Series

### Feature:

- Compliant with IEC International Standards and German Automotive industry standard LV124  
(Can perform rapid temperature change testing at 3K/minute with the specimens inside.)
- Low GWP coolant (R-449A) as standard equipment



Walk-In Type Temperature (& Humidity) Chamber  
for High-Power Series

## ■ Walk-In Type Temperature (& Humidity) Chamber for Drive-In Series

### Features:

- Closely recreates various weather environments in a large space of approximately 500 m<sup>3</sup> accommodating two vehicles to perform actual vehicle testing
- Multiple environmental factors can be recreated simultaneously, including temperature and humidity, sunlight, rain, snow, fog, and wind

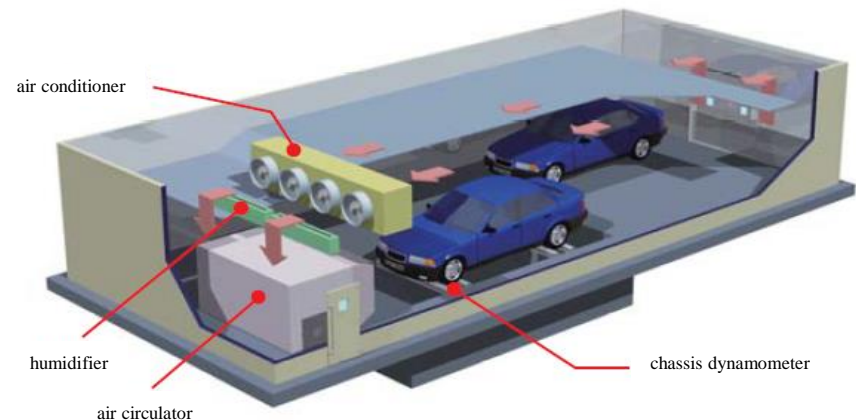


Image of vehicle test

Walk-In Type Temperature (& Humidity) Chamber  
for Drive-In Series

# Equipment Business New Product Introduction (2)

## For the medical field

(Released in Apr./Jun. 2021)

### ■ Freezer for Temperature Controlled Transport Ultra-Low-Temperature Freezer

#### Features:

- Freezer for Temperature Controlled Transport:  
Supports small-lot transport and storage of items such as vaccines; vibration resistant, energy efficient and portable.
- Ultra-Low-Temperature Freezer:  
Capable of small-lot storage to  $-75^{\circ}\text{C}$ ; Two types of freezers, floor and table.



Freezer for Temperature  
Controlled Transport



Ultra-Low-Temperature  
Freezer

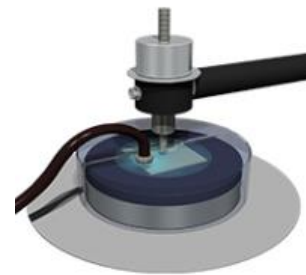
## For material field

(Released in Dec. 2019)

### ■ Thermal Air Test System

#### Features:

- Can be combined with various materials testing instruments to perform materials testing in actual usage environment with given temperature
- Uses ESPEC's proprietary new method for cooling and heating test pieces efficiently



Example of set up with friction and wear testing machines and  
hardness meter (Left)  
Thermal Air Test System (Right)

# Equipment Business Examples of Products Delivered (1)

(Delivered in Jul. 2018)

## ■ Walk-in Type Temperature (& Humidity) Chamber, for building materials

### Uses:

Reproduce the environment inside apartments (temperature and humidity) and outdoors (weather such as rain, snow, and sunlight), conduct performance evaluations and durability tests of building materials for sash, balcony, etc.



Walk-in Type Temperature (& Humidity) Chambers,  
for use for building materials



Temperature (& Humidity)  
Chambers are movable so  
that building materials for  
testing can be easily changed



Furnished with irradiation  
equipment and watering (rain)  
equipment, to reproduce an  
outdoor weather environment

# Equipment Business Examples of Products Delivered (2)

(Delivered in Mar. 2016)

■ Smart System Research Facility,  
Fukushima Renewable Energy Institute, AIST  
(Koriyama city, Fukushima)

Product delivered:

Large Walk-in Type Temperature & Humidity Chamber

Uses:

Performance and safety evaluation for large power conditioners for solar power generation

Supports heat generation loads of 100 kw and large weights (21 tons)



Large Walk-in Type Temperature & Humidity Chamber

■ National Laboratory for advanced energy storage technologies (NLAB), National Institute of Technology and Evaluation (Nanko, Osaka City)

Product delivered:

1. Walk-in Type Temperature & Humidity Chamber for charge-discharge testing
2. External short-circuit testing equipment (energy devices equipment)

Uses:

1. Evaluate the performance of storage batteries by repeatedly charging and discharging them
2. Evaluate safety by confirming that storage batteries will not catch fire or rupture if they short circuit



Walk-in Type Temperature & Humidity Chamber for charge-discharge testing



# 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)

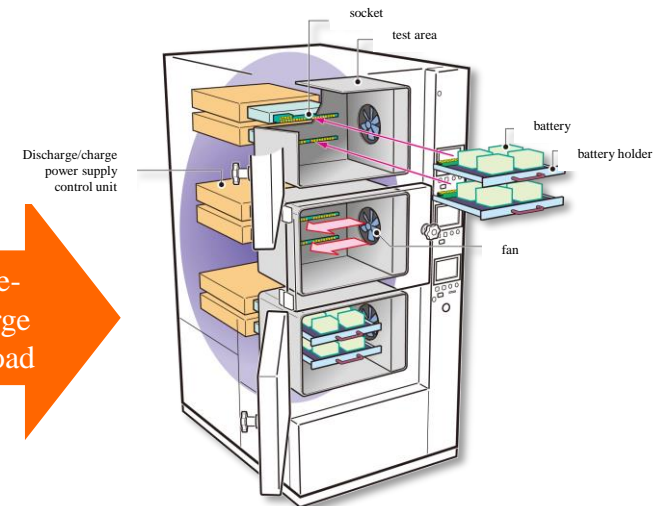


Charge-discharge Cycle  
Evaluation Equipment

Secondary  
Batteries



Charge-  
discharge  
cycle load



Checking the charge-discharge  
characteristics of secondary batteries

Evaluating the performance and life of secondary batteries

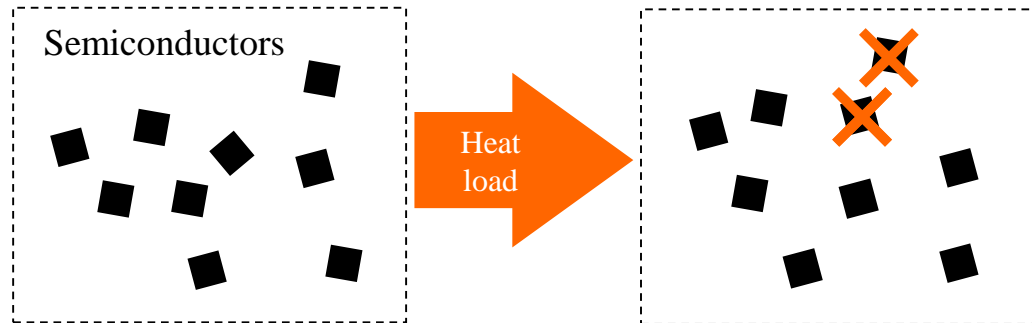
# Equipment Business Usage Case with Semiconductor Equipment

## Screening

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



Burn-In Chamber



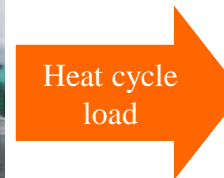
Elimination of latent early failures

## Reliability Evaluation

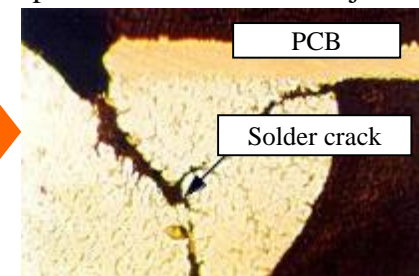
Used to evaluate basic failure patterns to ensure reliability in the development of new technologies



Conductor Resistance Evaluation System



Example of defect in soldered joint



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

## Laboratory Testing Services and Facility Rentals

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

- The company has four laboratory testing centers in Japan, one in Thailand, two in China.

(Japan: Utsunomiya, Toyota, Kariya and Kobe, Thailand, China: Shanghai, Suzhou)

- The centers are also recognized as official calibration facilities under the Japan Calibration Service System (JCSS).

- **First in world** Opened Battery Safety Testing Center.(in Sep. 2015)

- Providing a one-stop service for testing and certification application services compliant with United Nations regulations on the safety of automotive secondary batteries.
- Entered into business alliance with TÜV SÜD Japan Ltd., a third-party certification agency (in Oct. 2014).

- **First in Japan** Acquire ISO/IEC 17025\* test facility certification simultaneously in the three fields of automobiles, trains and airplanes.

- **First in Japan** The Toyota Test Center addressing all test items set forth by the LV124 German Automotive Manufacturer Testing Standards.



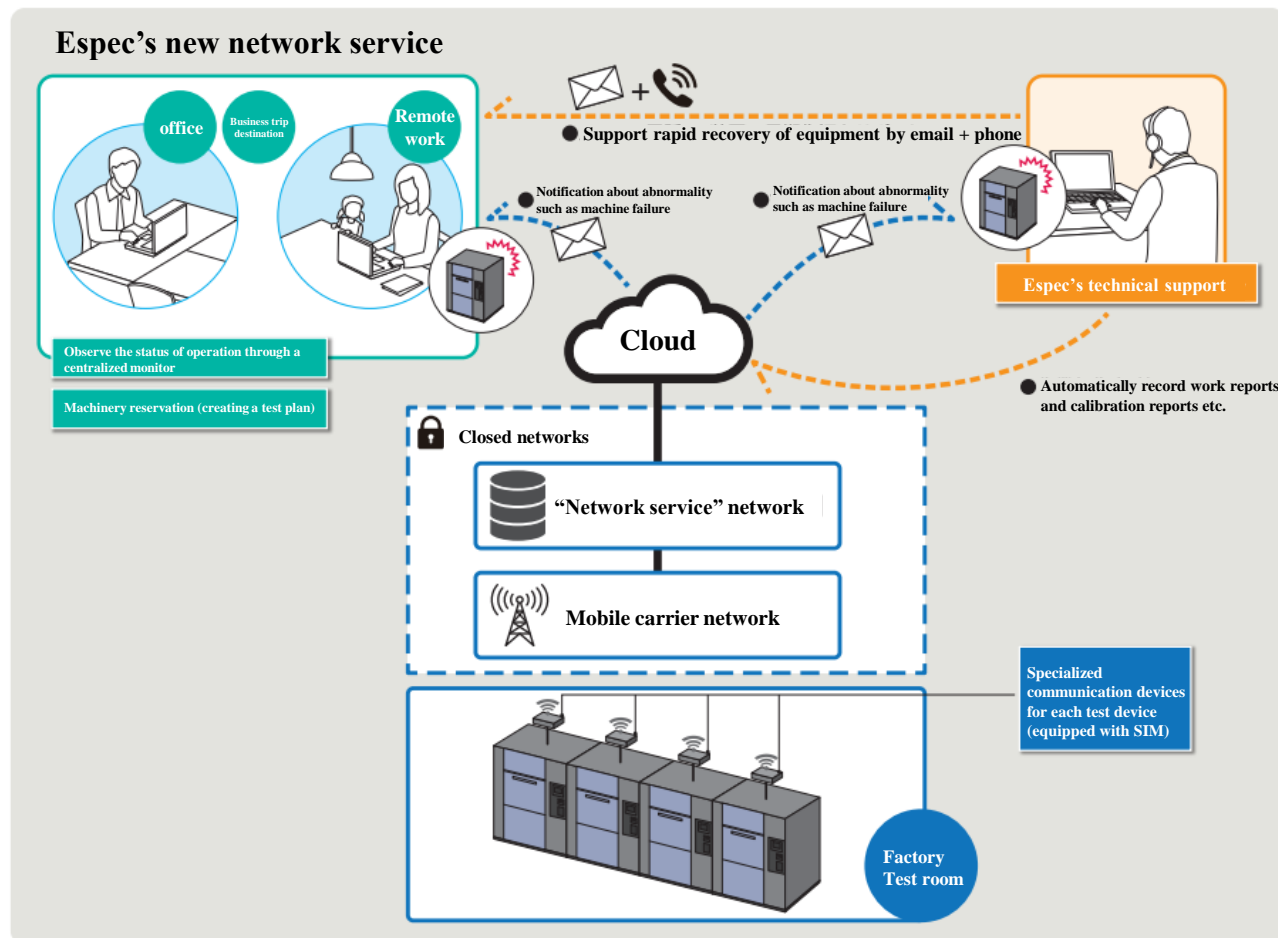
Battery Safety Testing Center

\* ISO/IEC 17025: An international standard in which an authoritative third-party organization certifies whether a test facility or calibration organization is capable of producing accurate measurements or calibration results.

# Service Business After-Sales Service

(Started in Apr. 2022)

“Network service” utilizing mobile communications and cloud computing.  
Eases the burden on customers' tests and machinery management, and reduces equipment downtime.



# Service Business After-Sales Service

“Home-based online service”  
to support continuity of customers’ development operations

## When using ESPEC products

Operate equipment and monitor samples from home

- Centralized management  
(monitoring and data analysis)
- Receive operating status by email
- Monitor samples using in-chamber monitoring camera (launched in March 2020)

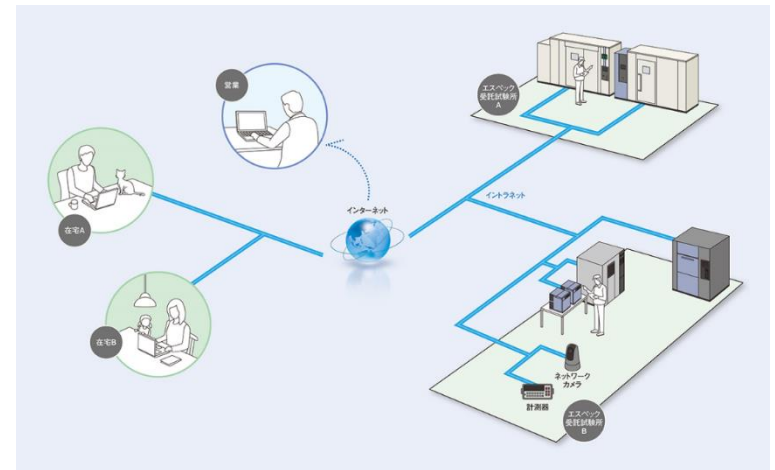


Image of in-chamber monitoring camera

## When using laboratory testing center

All testing operations performed on behalf of customer, from start to finish, including transportation

- Remote consultation
- No need to attend in person
- Remote instruction



# Service Business Laboratory Testing Services

First in Japan to realize 100% green electricity for laboratory testing services  
Contributing to the reduction of CO<sub>2</sub> emissions in customers' supply chains

We introduced renewable energy and became first in Japan to realize 100% green electricity for laboratory testing services in April 2021. We expect to reduce annual CO<sub>2</sub> emissions by approximately 4,187 t.

Laboratory testing centers in Japan:



Kobe Test Center



Toyota Test Center



Kariya Test Center



Utsunomiya Test Center



Battery Safety Testing Center



# Service Business Laboratory Testing Services

World's first  
Battery Safety Testing Center compliant  
with United Nations regulations

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. )



Crush Testing Equipment  
(No. 1 Safety Test Room)



No. 2 Safety  
Test Room

First testing facility in Japan to address  
German Automotive Manufacturer Testing  
Standards  
Renovated the Toyota Test Center

Supporting Japanese automotive equipment manufacturers seeking to develop global operations by addressing all test items set forth by the LV124 German Automotive Manufacturer Testing Standards  
(Renovated the Toyota Test Center in September 2019)



Toyota Test Center



# Other Business

## Environmental Preservation

### ■ 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 Production Systems

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



Plant factory



Phyto-toron

## Produced a high value-added vegetables using deep sea water

Production and sales of vegetables high in minerals with the use of deep sea water at a plant factory near Haneda Airport.



Interior of the plant factory and factory-produced vegetables “mineraleaf”



# Other Business Examples of Products Delivered

## ■ Arid Land Research Center, Tottori University

(Delivered in Mar. 2016)

### Products delivered:

Experimental System for Analyzing Responses of Dryland plants to Climate Changes (2 units)  
(Simulates the climates of arid lands, including high temperature, low humidity, strong sunlight, and high winds)

### Uses:

Plant cultivation experiments and experiments to develop efficient water-usage technologies in arid lands, research to solve issues facing arid lands



Experimental System for Analyzing Responses of  
Dryland plants to Climate Changes



Experiment in progress  
(Testing wheat for drought stress)

# Strengthen Technology Development Capability

(Introduction to technology development building)

Objective: Strengthen technology development capabilities  
by encouraging open innovation and promote  
preservation of biodiversity

Concepts : “Open innovation,”

“Open communication,”

“Coexistence with the natural environment”

Location: Kanokodai, Kita-ku, Kobe, Hyogo (in Kobe R&D Center)

Start of operation: May 2020

(Construction started in June 2019)

Building area: 1,580m<sup>2</sup>

Gross floor area: 4,557m<sup>2</sup> (Three story building)



Rooftop green space using only native species



Technology development building

# Introduction to ESPEC's All Weather Simulation Chamber (in the Kobe R&D Center)

(Mar. 2021)

## Opened the world's first All Weather Simulation Chamber Encouraging open innovation and strengthening environmental creation technology

Replicates dynamic climate environments with high-precision control and variation of seven environmental factors (temperature, humidity, snow, fog, rain, sunlight and wind)

### ■ All Weather Simulation Chamber



### ■ Examples of tests in dynamic environments



#### (1) Tests to replicate the change from sleet to snow

Snow with different amounts of water content can be replicated, including snowfall at temperatures around 0°C, which is close to snowfall in a natural environment. By controlling the snow quality and temperature, the laboratory replicates the change from sleet to snow. The laboratory can confirm the performance of automated driving sensors for which snow accretion has become a problem.



Test chamber: Width 6 m x Depth 9 m x Height 3 m

A black coating is applied to suppress the diffuse reflection of light.



#### (2) Experiment to replicate the change from rain to fog

The laboratory controls the thickness, temperature and humidity of fog and replicates the change from rain to fog. The laboratory can confirm the performance of automated driving sensors in response to the effects of fog.

## ■ About ESPEC's Sustainability

Guided by our corporate philosophy,  
“THE ESPEC MIND,” ESPEC will help to solve social and  
environmental issues through businesses centered on  
environmental creation technology, with the aim of achieving  
sustainable growth.

# Corporate Philosophy

Our important values that have been passed on since our inception  
“THE ESPEC MIND” (Excerpt)

## The Origin

Aim for better value exchange as a public institution

## Mission

Provide more certain Seikankyo (living environment) via environmental creation technology

## Style

Progressive, Reliable, Open, Fair

## Declaration

What ESPEC promises society

“compliance,” “culture,” “human rights,” “the environment,”  
“education/enlightenment.”

# Sustainability Policy and Materiality

Looking toward sustainable growth, we formulated a sustainability policy, and identified materiality (important issues) that must be addressed in order to produce social and economic value.

## Sustainability Policy

- By putting our corporate philosophy (THE ESPEC MIND) into practice, we are working to create and improve both social value and economic value.
- By maintaining a good exchange of value with our stakeholders, we are aiming for continuing growth.
- Based on ESPEC Vision 2025, we will contribute to solutions for the global environment and social issues through our business activities, centering on Environmental Creation Technology.
- We will engage in active disclosure of information related to sustainability.

## Materiality

- |   |  |
|---|--|
| •Innovations in business structures                   | •Strengthening functions                         |
| •Preservation of the global environment               | •Strengthening governance                        |
| •Developing human resources and vitalizing workplaces | •Promoting diversity and respecting human rights |



# ESPEC's Contribution to the SDGs

ESPEC will contribute to the realization of a sustainable society by supplying products and services centered on environmental creation technology in a wide range of fields, including advanced technologies.

## ESPEC

### The Value ESPEC Provides

- Supply products and services centered on environmental creation technology
- Provide environmental preservation services
- Provide plant factories to address global warming and extreme weather

### Strengths

- Business domains essential to the development of society
- Global leading brand and high-quality products and services based on a unique technologies
- Global production and sales networks

## Customer products and technologies



- Automobiles (EVs and automated driving)
- Electronic components (semiconductors)
- IoT
- AI
- Batteries
- Pharmaceuticals
- Food
- Materials
- Environmental preservation
- Agriculture etc.

## Society

Realize a sustainable society



- Realize a safe and secure society through the development of automated driving and preventive safety technologies for automobiles
- Contribute to the solution of environmental and energy problems through the development of energy-saving technologies and EV technologies
- Alleviate personnel shortages and improve productivity through the development of IoT-related technologies
- Preserve biodiversity through the environmental preservation business, including reforestation (tree planting) and waterfront biotope restoration
- Support research on the creation of new plant species to cope with extreme weather and provide a stable supply of food through plant factories. etc.



# ESPEC's Businesses and the SDGs

## Equipment Business



Contribute to the development of advanced technologies through the supply of products and services leveraging environmental creation technology

- Supply products and services that contribute to the development of advanced technologies to solve social and environmental issues

### ● Environmental Test Chamber

Supply environmental test chambers that artificially replicate environmental factors such as temperature and humidity, thereby ensuring the reliability of products

### ● Energy Device Equipment

Supply evaluation systems for secondary batteries and fuel cells installed in eco cars

### ● Semiconductor Equipment

Supply products such as burn-in chambers and systems for semiconductor inspection and measurement and evaluation systems

### ● Pharmaceutical Equipment

Supply products such as freezers for COVID-19 vaccines and stability test chambers used for quality control of items such as pharmaceuticals and food



Temperature & Humidity Chamber  
"Platinous J series"



Drive-In Chamber for Vehicle Testing



Burn-In chamber  
for semiconductor inspection



Advanced Battery Tester  
for secondary batteries

# ESPEC's Business and the SDGs

## Service Business



Contribute to the development of advanced technologies through the supply of products and services leveraging environmental creation technology

- Supply products and services that contribute to the development of advanced technologies to solve social and environmental issues

### ● After-sales Service and Engineering

Conduct product maintenance and preventive maintenance so that customers can use systems with peace of mind.

### ● Laboratory Testing Services

Provide laboratory testing services based on technologies and testing expertise developed through environmental tests.



Technical support using IT



Capable of performing various safety tests for secondary batteries compliant with United Nations regulations and other standards  
Battery Safety Testing Center

# ESPEC's Business and the SDGs

## Environmental Preservation Business



### Contribute to biodiversity preservation

A business to restore natural environments through projects such as reforestation (tree planting) with local native plant species and waterfront biotope restoration to rehabilitate natural river ecosystems. Contribute to the prevention of global warming and biodiversity preservation.



A forest restored along the approach to Rinno-ji Temple in Sendai



Waterfront biotope restoration on the Sumida River Terrace in Tokyo

## Plant Production Systems Business



### Contribute to a stable food supply to address global warming and extreme weather

Supply plant factories that artificially replicate plant growing environments and enable vegetables to be grown systematically even under extreme weather conditions.

Contribute to a stable food supply by supplying systems that can be used in research into drought-tolerant plants.

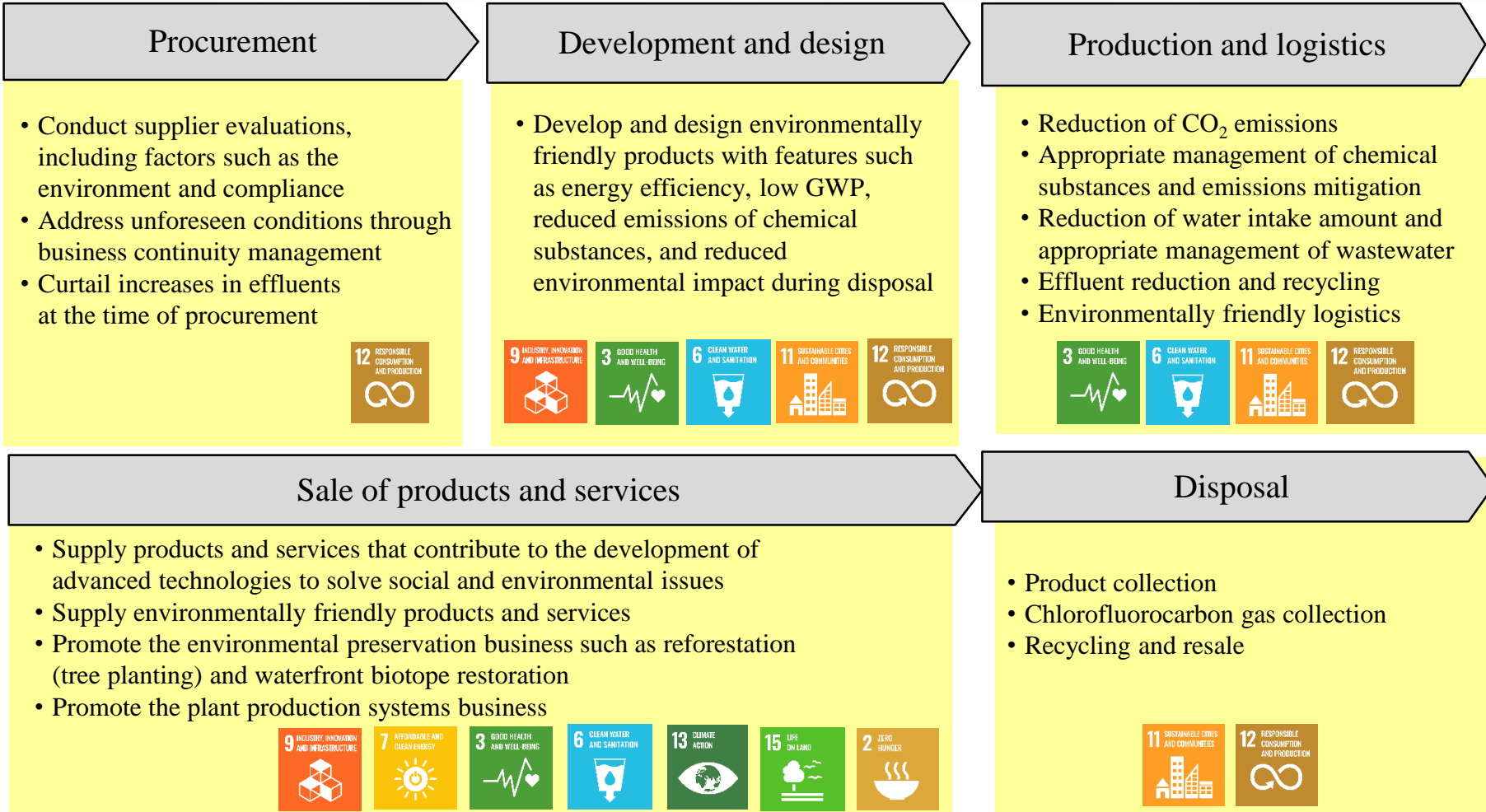


Plant factory using deep sea water  
Produce and sell vegetables high in minerals



Experimental System for Analyzing Responses of Dryland Plants to Climate Change  
(Arid Land Research Center, Tottori University)

# Contribute to SDGs in the Supply Chain



## Foundation supporting the supply chain

- Improve customer satisfaction and ensure product quality and safety
- Respect for human rights • Promote the success of diverse human resources
- Provide appropriate information disclosure and communication
- Fair management with transparency





# Products and Services that Contribute to Resolving Environmental and Energy Issues

- Product lineup to evaluate the performance and durability of secondary batteries, fuel cells, solar batteries and power devices



Secondary Battery Charge-Discharge Evaluation System



Fuel Cells Evaluation System



Temperature Cycle Test System for Solar Battery Modules



Power Cycle Test System for Power Device

- World's first Battery Safety Testing Center

Supports the implementation of testing and certification application services compliant with United Nations regulations on the safety of automotive rechargeable batteries.



Battery Safety Testing Center

- Laboratory testing services using 100% renewable energies (domestic)

# Biodiversity Preservation Initiatives

Kobe R&D Center, a hub for biodiversity preservation activities  
Developed rooftop green space using only plant species native to the  
northern Rokko region

The site has a forest of approximately 30,000 trees comprising native plant species, planted and grown by employees; rooftop green space using plant species native to the northern Rokko region on the roof of the technology development building; and a biotope made up of two ponds and a stream. ESPEC MIC CORP., which manages the environmental preservation business, conducted the tree planting and construction.



Kobe R&D Center received the FY2021  
Chairperson's Award of the Japan Greenery  
Research and Development Center under the  
National Award for Factory Greening.

# Contributing to COVID-19 Vaccination

## Contributing to the cold chain of COVID-19 vaccines

- Launched sales of freezer for temperature controlled transport in April 2021, and launched sales of ultra-low temperature freezers in June 2021, and also expanded services.
- Free rental of constant temperature transportation freezers, etc. to local governments.  
Total of 41 units in the first round (April to June 2021)  
Total of 34 units in the second round (December 2021 to March 2022)



Freezer for Temperature Controlled Transport  
Supports transport and storage of temperature range from 2 °C to 8°C and -20°C  
Vibration resistant, energy efficient and portable



Ultra-Low-Temperature Freezers  
Two types of freezers, floor and table, and capable of storage to -75°C



# Promotion of Diversity

## Initiatives to promote women's success



From the Ministry of Health, Labor and Welfare:  
The Company received the "Kurumin" certification,  
which is granted to companies that support child-rearing.  
And the highest ranking of the certification mark  
"Eruboshi" based on the Act on Promotion of Women's  
Participation and Advancement in the Workplace.



The female leadership development program

## Opened ESPEC Smile Farm, a plantation staffed by workers with disabilities

- Opened a farm staffed by workers with disabilities within a rented farm operated by a company to support the hiring of people with disabilities in November 2021.
- 4 individuals were hired to work at ESPEC Smile Farm, specifically 3 staff members with disabilities and 1 farm foreman.
- The cultivated vegetables were donated to local children's cafeterias and distributed to employees.



Employees picked vegetables as a team

# Employee Education/Donation System

## Employee Education System Enhancement

- Implement training sessions to share the corporate philosophy
- Implement a Global Trainee Program aimed at developing human resources who are capable of working in international settings
- Enhance the education program to support management executive education and self-development



On-site training in the Global Trainee Program (U.S.)

## ESPEC Smile Club: a donation system featuring employee participation

- Established a matching gift system in which the company matches donations made by employees as part of activities to promote SDGs (Dec. 2020).
- Donated to an organization that conducts CSR activities related to children and medical care.
- In March 2022, donated a total of ¥758,800 to non-profit organization Save the Children Japan's emergency fund to support children during the Ukraine crisis.



# Contributions to Society

## ESPEC Foundation for Earth Environment Research and Technologies

- Provides funding support every year for research, technology development on global environmental conservation
- Grants totaling ¥138.4 million have been provided to a total of 273 groups over the past 25 years since the Foundation was established.



Award Ceremony

## Tree Planting Ceremony at “Millenium Hope Hills” in Iwanuma, Miyagi Prefecture

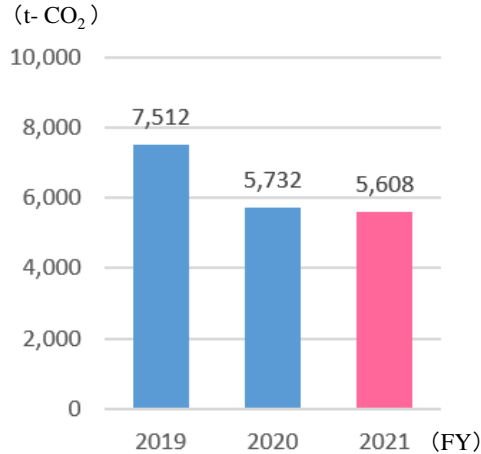
- A disaster recovery project started in 2013
- The project has cumulatively planted about 350,000 trees that will form a forested coastal tide embankment across a roughly 10km stretch of coastline in the city of Iwanuma.
- Group company ESPEC MIC CORP. supported the project.
- The final tree planting ceremony was held in June 2021 (first part) and May 2022 (second part).



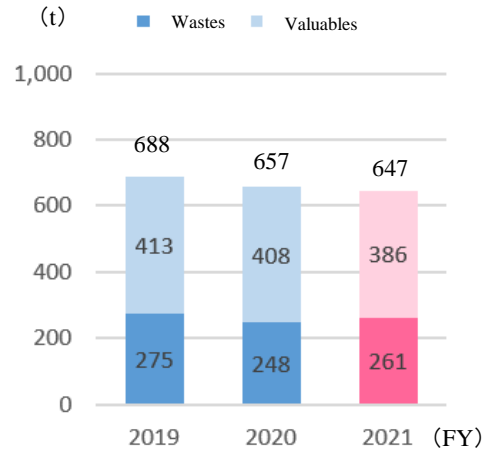
Tree Planting Ceremony

# Non-Financial Data (Environmental Aspects)

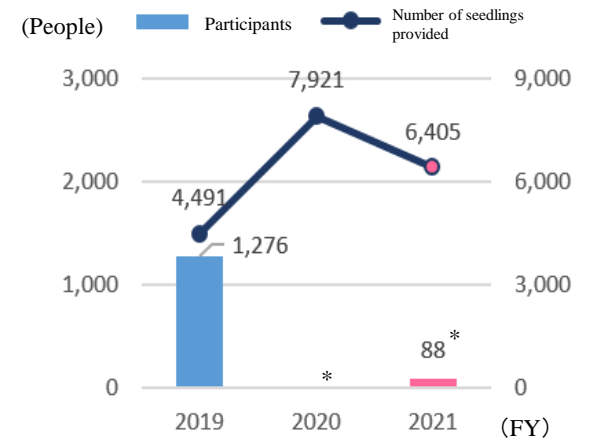
## Contribution to CO2 emissions mitigation through the sale of energy efficient products



## Total amount of effluents

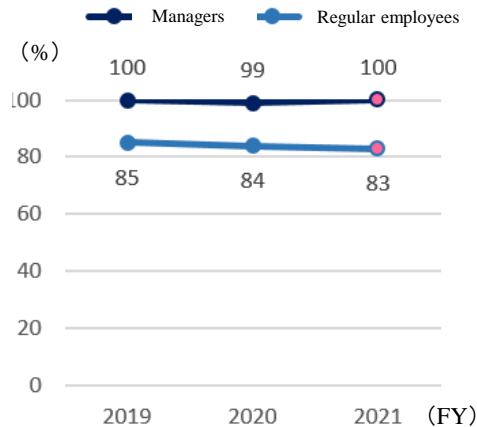


## Number of participants in ESPEC Midori-nogakko schools (ESPEC Green School) Number of seedlings provided for green curtains

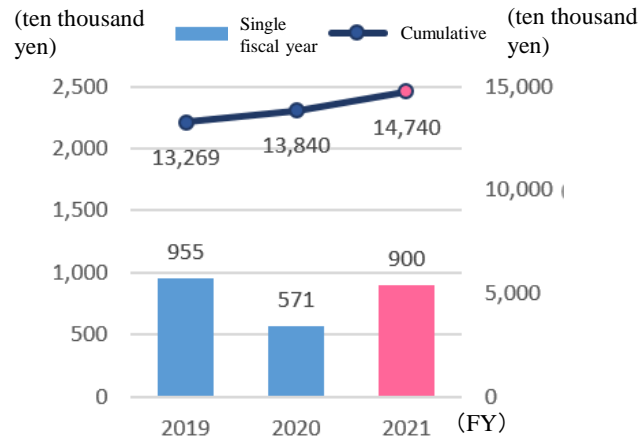


\*FY2020 and FY2021 events cancelled or frequency reduced due to spread of COVID-19.

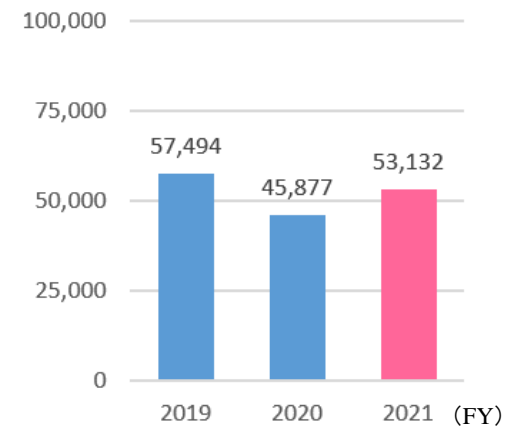
## Certification acquisition rate for the Certification Test for Environmental Specialists (Eco Test)



## Grants from the ESPEC Foundation for Earth Environment Research and Technologies



## Number of trees planted through environmental preservation business



\* Actual results for ESPEC MIC CORP.

# Non-Financial Data (Social Aspects)

## FY 2021 Results

Number of registered members of the “Test Navi” information website for engineers

**22,154**

Number of employees (consolidated)

**1,628**

Number of employees at overseas consolidated subsidiaries

**735**

Number of female officers (including executive officers)

**2**

Ratio of female managers

**6.0%**

\*As of April 1, 2022

Share of periodic recruitment

Women **28.6%**

Non-Japanese **14.3%**

\*Joined on April 1, 2022

Ratio of employees taking childcare leave

Women **100%**

Men **30.8%**

Occupational injuries (excluding minor injuries without lost workdays)

**2**

Rate of health check examination

**100%**



# External Recognition

July, 2022

- Ranked 334th in Toyo Keizai Inc.'s 2022 SDGs Corporate Ranking



**FTSE Blossom  
Japan Sector  
Relative Index**

April, 2022

- First Selection as Part of FTSE Blossom Japan Sector Relative Index

February, 2022

- Ranked 334th in Toyo Keizai Inc.'s 2022 CSR Corporate Ranking

December, 2021

- A score of B for the second consecutive year in the CDP Climate Change 2021 Questionnaire
- Selected as a "GRADE AAA" company website (overall ranking) in the All Japanese Listed Companies' Website Ranking 2021 by Nikko Investor Relations Co., Ltd.
- Awarded a Bronze Prize in the Gomez IR Website Ranking 2021 by BroadBand Security, Inc. (ranked 27th according to industry)



November, 2021

- Rated 3 stars in Nikkei's 5<sup>th</sup> Smart Work Management Survey
- Rated 3.5 stars in the Nikkei's 3<sup>rd</sup> SDGs Management Survey



October, 2021

- Ranked 169th in the Nikkan Kogyo Shimbun's Corporate Power Ranking (sponsored by the Ministry of Economy, Trade and Industry)



June, 2020

- Consecutively selected Ministry of Economy, Trade and Industry (METI) Global Niche Top Companies Selection 100.

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Quality is more than a word

ESPEC