Securities ID code:6859

Reference

Company Presentation and Business Overview

ESPEC CORP.
May 26, 2025

Company Profile

Industry-leading manufacturer of environmental test chambers

Name	ESPEC CORP.
Head Office	3-5-6, Tenjinbashi, Kita-ku, Osaka
Representative	Representative Director and President Satoshi Arata
Established	July 25, 1947
Incorporated	January 13, 1954
Paid-up Capital	¥6,895 million
Issued shares	23,781,394 Shares
Employees	1,860 (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.

Head Office

Share of Environmental Test Chambers

Over 30% worldwide, Over 60% domestic

* Market shares are ESPEC estimates

(As of March 31, 2025)

Global Network

Consolidated Subsidiaries
13 companies
(Global 9 companies,
Domestic 4 companies)

Global Network
50 locations
44 companies

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

EUROPE

●ESPEC EUROPE GmbH
-ESPEC IKLIM KABINLERİ SATIS VE MUHENDISLIK LIMITED SIRKETI

U.S.A.

●ESPEC NORTH AMERICA, INC *

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.

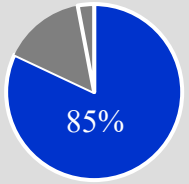
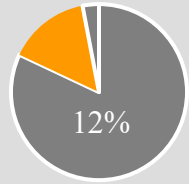
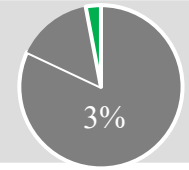
JAPAN

ESPEC CORP. *
●ESPEC ASSIST CORP.
●ESPEC MIC CORP.
●ESPEC THERMAL TECH SYSTEM CORP. *
●COSMOPIA HIGHTECH CORP. *

●: Consolidated Subsidiaries
- : Non-consolidated Subsidiaries

*Denotes company with production functions.

Summary of ESPEC Business (Per Market / Use)

		Main Products	Market	Use	Sales Composition (FY2024)
Equipment Business	Environmental Test Chambers	•Temperature & humidity chamber •Thermal shock chamber •Bench-top type temperature & humidity chamber •HAST chamber •Walk-in type temperature & humidity chamber •Combined temperature & humidity chamber •HALT & HASS test chamber •FPD equipment	•Electronic component and equipment market •Automobile market •Semiconductor market •Pharmaceuticals, Cosmetics, Foods market •LCD and Organic Electro-Luminescence market	•For R & D •For credibility and evaluation •For production and inspection	
	Energy Device Equipment	•LIB charge-discharge cycle evaluation equipment •LIB safety evaluation system •Fuel cells evaluation system	•Next generation automobile market •Secondary batteries market •Fuel cells market	•For R & D •For credibility and evaluation •For safety evaluation •For production	
	Semiconductor Equipment	•Burn-in system •Semiconductor evaluation system	•Semiconductor market •Automobile market	•For production and inspection •For development and evaluation	
Service Business	After-sales Service and Engineering	•After-sales service •Construction around equipment	•Electronic component and equipment market •Automobile market •Semiconductor market	—	
	Laboratory Testing Services and Facility Rentals	•Laboratory testing services •Resale • Equipment rental •Calibration		•For R & D •For credibility and evaluation	
Other Business	Environmental Conservation	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

Consecutively selected as a winner of
Ministry of Economy, Trade and Industry (METI)
"Global Niche Top Companies Selection 100"
(FY 2013, FY 2020)

Temperature & Humidity Chamber
"Platinous J series"

* Market shares are ESPEC estimates

Transition in Business

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

Growth of ESPEC

Home appliances

Integrated circuit

Large scale integration

LCD

PC

Surface mount package

Smartphones

IoT, Next-generation automobiles

Eco cars such as EVs, HVs, and PHVs

Storage of electricity generation of electricity

1947 Founded | 1961 | 1975 | 1985 | 1995 | 2005 | 2015 | Present

Business expansion

1961
Environmental test chambers developed

1982
Launching of the semiconductor equipment business

1986
Launching of the FPD Equipment business

1994
Launching of the measurement system business

2011
Launching of the energy device equipment business

2015
Launching of battery safety testing business

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), 44 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

In-vehicle parts/electrical components
・ECU
・Inverter
・Converter
・Sensor
・Motor
etc.

Automotive Batteries
・Lithium-ion battery
・All solid-state battery
etc.

Electric Vehicle (EV) image

Representative Examples for Environmental Testing

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

Equipment Business: Main New Products

Release Date	Name of product	Features
Apr. 2025	Ultra-Low-Temperature Shock Freezer	•Preservation of perishable food freshness through rapid freezing to an ultra-low temperature of -70° C •Automatically completes the entire process of food freezing, storing, defrosting and reheating
Apr. 2025	Rapid-Rate Thermal Cycle Chamber High-Performance Model	•Capable of specimen temperature ramp control at a rate of 20K/min •Complies with semiconductor package reliability test standards and international standards for electronics and automotive markets, among others
Jan. 2025	Expansion of Commissioned Measurement Services (Thermal Dependent Warpage Measurement Service / Thermal Image Analysis Service)	•Thermal Dependent Warpage Measurement System: Supports reflow oven temperature environment (up to 260°C) and large substrate sizes •Thermal Image Analysis System: High-speed, high-precision thermal image analysis
Nov. 2024	Low Temperature (& Humidity) Chamber Featuring R-449A low GWP* refrigerant Platinous J Series ECO Type	•Offers up to a 70% reduction in power consumption compared to current models through proprietary refrigeration technology.
Oct. 2024	Rapid-Rate Thermal Cycle Chamber Premium Excellent Series (EC-28PXHH) Featuring R-473A, R449A Low GWP* Refrigerant	•Launched by COSMOPIA HIGHTECH CORP., a group company. •Capable of rapid temperature change testing in compliance with international testing standards.
Jan. 2024	Thermal Dependent Warpage Measurement System	•Visualize the warpage deformation of semiconductor packages and mounting substrates in a thermal environment. •Contributes to solving bonding defect issues in mounting substrates caused by increased power consumption or heat generation.

*GWP：Global Warming Potential. The smaller the value, the less environmental impact.

Equipment Business: New Product Introduction 1

For the automotive fields

■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

(Released in Feb. 2020)

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

Features:

- Closely recreates various weather environments in a large space of approximately 500 ㎥ 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

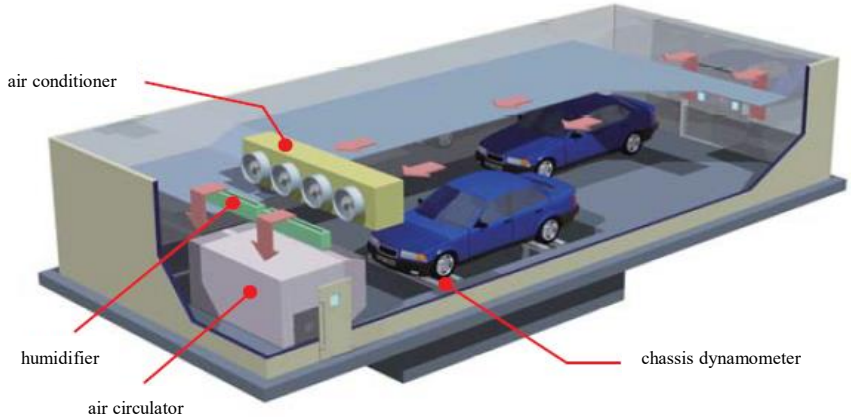


Image of vehicle test

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

Equipment Business: New Product Introduction 2

For the semiconductor and electronic component fields

(Expansion in Jan. 2025)

■Commissioned Measurement Services

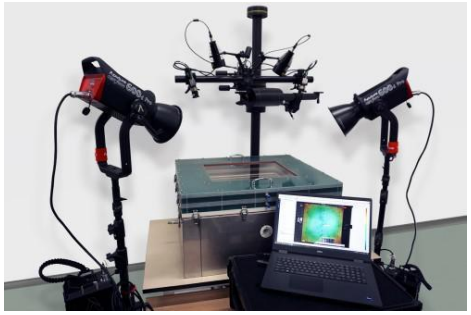
Contribute to improving the accuracy of thermal analysis CAE and heat dissipation design of semiconductor packages, mounting substrates, etc.

●Thermal Dependent Warpage Measurement Service

- Visualize the warpage deformation of semiconductor packages and mounting substrates
- Supports reflow oven temperature environment (-40℃ to +260 ℃)
- Supports large substrate sizes up to 300 mm

●Thermal Image Analysis Service

- Visualize the temperature distribution of specimens under constant temperature environment (-40 ℃ to +100 ℃)



Thermal Dependent Warpage Measurement Service

(Released in Mar. 2023)

■Burn-In Chamber Support for High Heat Generation Load

- Expanded the Burn-In Chamber which has permissible heat generation load by four times (compared to the Company's existing devices) under temperatures from -20 ℃ to 150 ℃.
- Enables precise temperature control even when semiconductors are in a state of high heat.
- Inspection volumes increased significantly, contributes to shorter inspection times.

Burn-In Chamber Support for High Heat Generation Load

Equipment Business: Examples of Products Delivered 1

(Delivered in Jul. 2018)

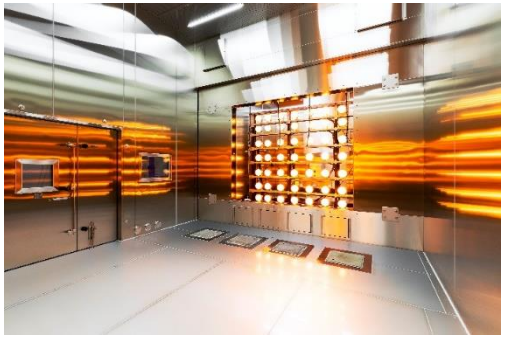
■Walk-in Type Temperature (& Humidity) Chamber, for building materials

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

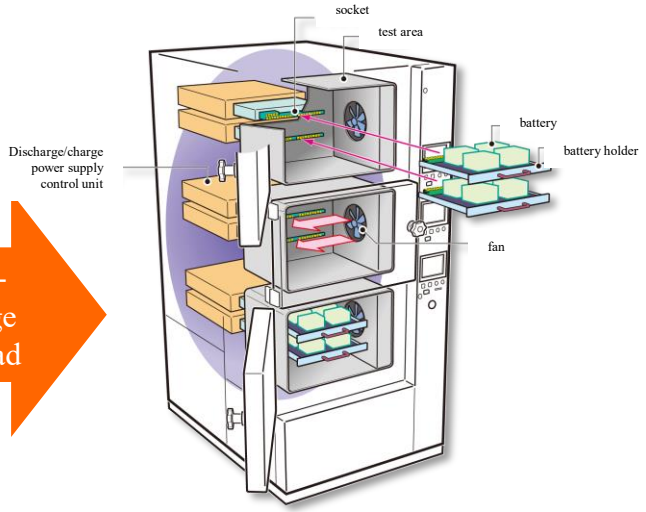
Charge-discharge Cycle Evaluation Equipment

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

Secondary Battery Charge-Discharge Evaluation System

Secondary Batteries

Charge-discharge cycle load



Checking the charge-discharge characteristics of secondary batteries

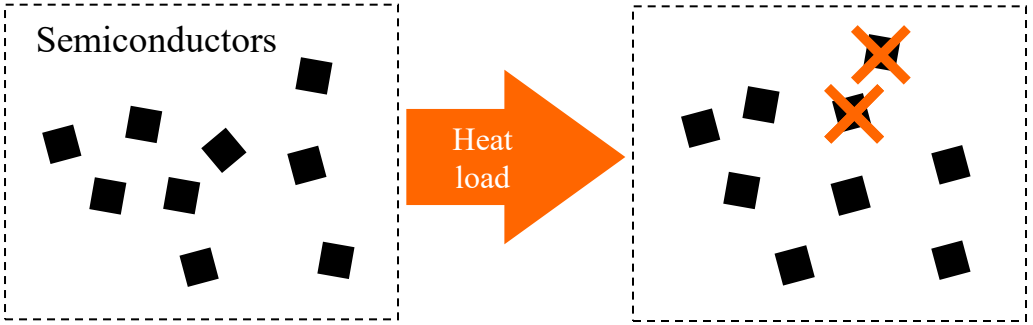
Evaluating the performance and life of secondary batteries

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

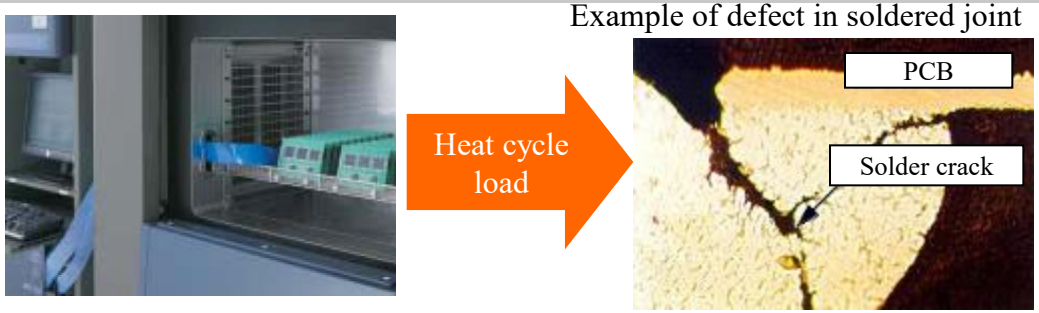


Elimination of latent early failures

Reliability Evaluation

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

Conductor Resistance Evaluation System



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 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 Five laboratory testing centers in Japan, one in Thailand, two in China.
(Japan: Utsunomiya, Toyota, Kariya, Tokoname and Kobe, Thailand, China: Shanghai, Suzhou)

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

Tochigi xEV Battery Safety Test & Certification Center
(within the Utsunomiya Technocomplex)

■ xEV Battery Safety Test & Certification Center provides one-stop testing and certification service for automotive secondary battery safety compliant with United Nations regulations

• In October 2014, entered into business alliance with TÜV SÜD Japan Ltd., a third-party certification agency

• In September 2015, opened in Utsunomiya City, Tochigi Prefecture, and in February 2025, opened in Tokoname City, Aichi Prefecture

■Acquire ISO/IEC 17025* test facility certification in the three fields of automobiles, trains and airplanes.

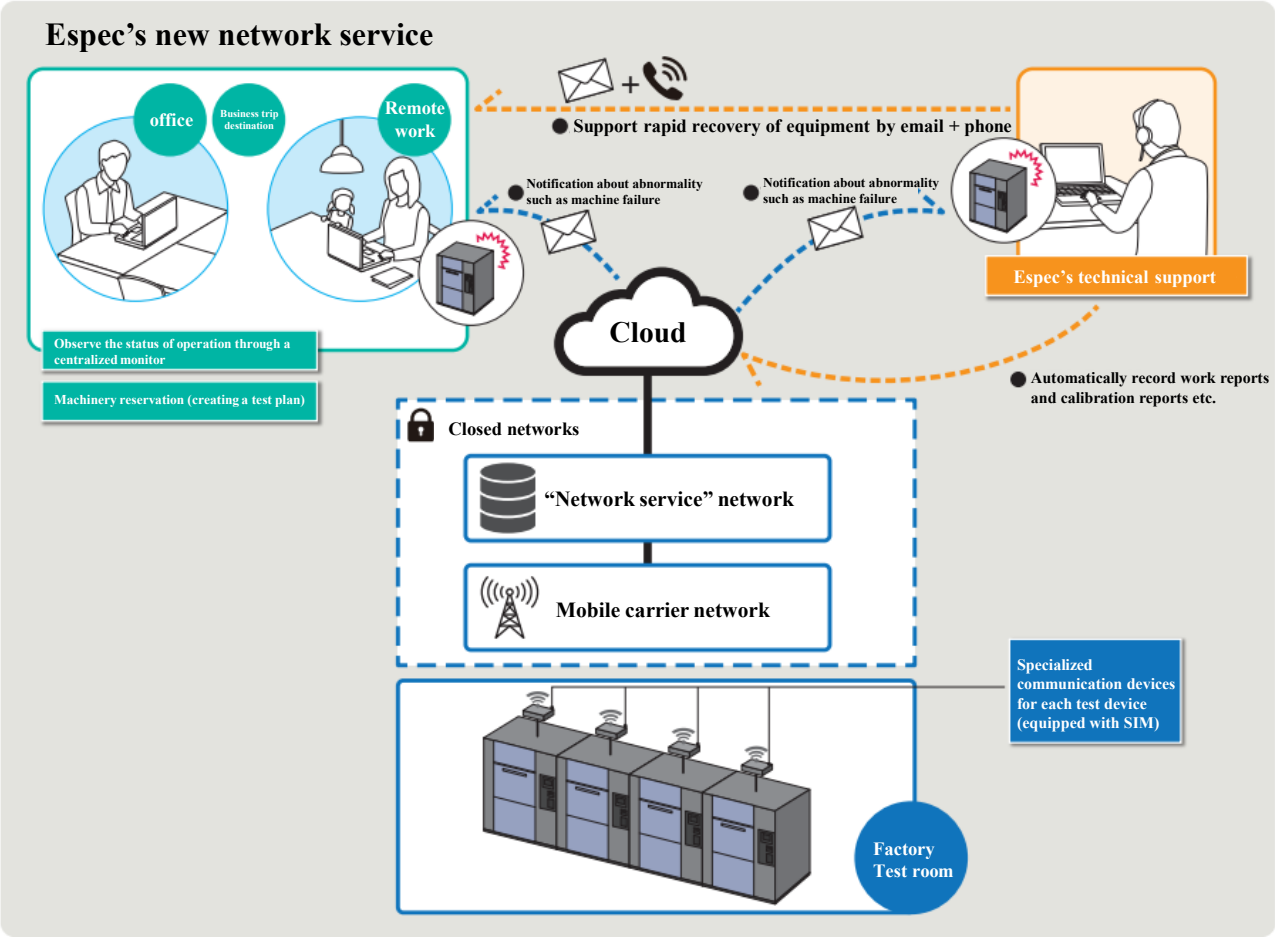
■**First in Japan** The Toyota Test Center addressing all test items set forth by the LV124 German Automotive Manufacturer Testing Standards.

* 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: Laboratory Testing Services

First Compliant with United Nations Regulations in the World

Tochigi xEV Battery Safety Test & Certification Center

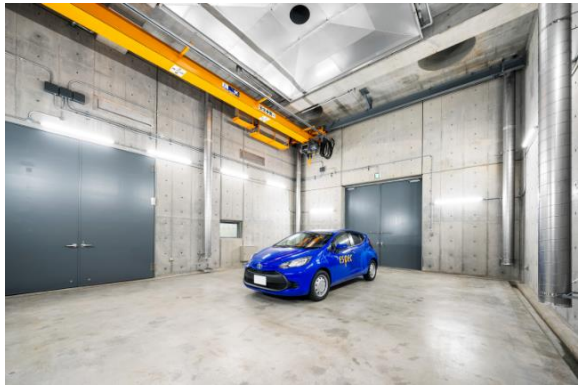
- In September 2015, opened in Utsunomiya Technocomplex.
- Provide a one-stop service to support the implementation of 9 safety tests and applications for certification by agencies, as stipulated by UN ECE R100-2. Part II, a United Nations regulation.

Aichi xEV Battery Safety Test & Certification Center, One of Japan's Largest Dedicated Automotive Rechargeable Battery Testing Centers

- Opened in February 2025 at the Tokoname site of Aichi Next Generation Mobility Test Lab.
- Supports larger and higher capacity automotive rechargeable batteries with cutting-edge testing facilities.

Crush Testing Equipment
(No. 1 Safety Test Room)

No. 2 Safety
Test Room



A safety testing room that
can accommodate one car

Service Business: Laboratory Testing Services

First Testing Facility in Japan Compatible with All German Automotive Manufacturer Testing Standards

- In September 2019, Toyota Test Center became compatible with all test items set forth by the LV124 German Automotive Manufacturer Testing Standards.
- In April 2025, functions were expanded to simulate the usage environment while EV and automation modules are in operation, and services were newly enhanced for conducting evaluation and measurement.

Toyota Test Center

First Commissioned Testing Service in Japan Powered 100% by Renewable Energies

- Since April 2021, commissioned testing services at five test centers across Japan (Utsunomiya, Toyota, Kariya, Kobe, Tochigi xEV Battery Safety Test & Certification Center and Aichi xEV Battery Safety Test & Certification Center) have been provided using renewable energies.
- Contributing to the reduction of CO2 emissions in customers' supply chains.

GREEN POWER

Test reports from tests conducted at ESPEC's testing centers receive the Green Power logo to clearly indicate zero CO2 emissions during testing.

Other Business

Environmental Preservation

■Reforestation (Tree planting)

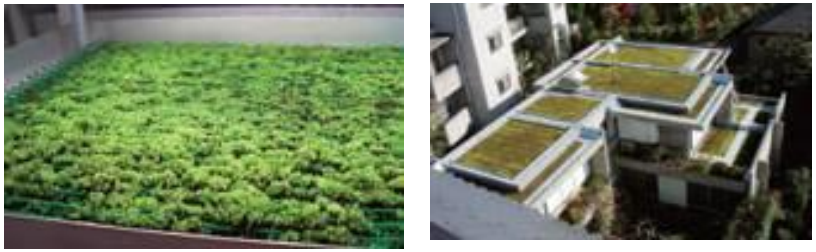
Recovery of local forest by selecting species and planting out seedlings using potential natural vegetation data.

■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

Other Business: Plant Production Systems

Joint Development with NARO Cultivation Environment Emulator

- Obtained a patent jointly with the National Agriculture and Food Research Organization (NARO) and others in October 2022.
- Precisely reproduces seasonal carbon dioxide concentration, temperature, humidity, etc.
- Contributes to development of crop production technologies adapted to climate change.

Cultivation Environment Emulator

* ESPEC MIC Corp. jointly obtained the patent with the National Agriculture and Food Research Organization (NARO), Riken and the Agri Open Innovation Institute.

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”

ESPEC MIC CORP. Started Joint Research at Kawasui Kawasaki Aquarium Using Aquaponics

In June 2023, ESPEC MIC CORP. started joint research with Kawasui Kawasaki Aquarium and the Laboratory of Tropical Crop Science, College of Bioresource Sciences, Nihon University on a demonstration experiment on a material circulation system using aquaponics.

*What is aquaponics?

A system that combines hydroponics and land-based cultivation. Bodily waste from fish is decomposed by microorganisms and used as a source of nutrients needed to grow plants. This enables vegetables to be grown either without using chemical fertilizers or reducing the amount of their use. Has attracted attention in recent years as a farming method considerate of the environment.

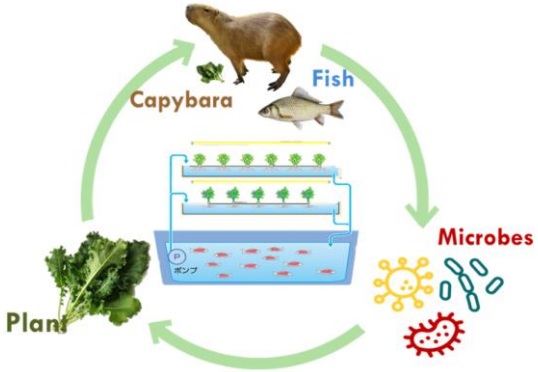


Diagram of a material circulation system using aquaponics

Uses capybara wastewater fermented with microorganisms to cultivate water spinach

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)

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

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.

■ 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℃, 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.

(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.

INQUIRIES:
ESPEC CORP.
3-5-6, Tenjinbashi, Kita-ku, Osaka 530-8550, Japan
E-mail: ir-div@espec.jp
Sustainability Management Department
Yasutoshi Nakagawa (General Manager),
IR & Public Relations Group
Natsuko Okawa and Hana Kaigawa