Test Chambers for the Aircraft Industry

We at ESPEC exploit the environmental creation technology that we have built up over the years to reproduce various earth environments. This technology enables us to run tests on reliability and safety in a wide range of environments, including the effects of impact, vibrations, and heat in the air. Ensuring safe flights for aircraft and prosperous lifestyles for people.

Fukuchiyama Plant (Opened in 1974)
1-7 Osadano-cho, Fukuchiyama, Kyoto. [Total area: 54,822 m² / Factory floor: 18,039 m²]

The ESPEC product line-up already exceeds 1,000 units for standard chambers alone, and we produce a large number of products customized to customer’s requests.

Providing reliable precision products based on our many years of experience.
Unbeatable production technology conceived through our accumulated knowhow.
High-accuracy temperature & humidity control technology, high-accuracy low-pressure & temperature control technology, etc.

Contributing reliability test support for electronic parts used in Hayabusa, the world’s first asteroid probe.
After a seven-year journey in space, the Hayabusa probe returned to earth with a cargo of samples from an asteroid for the first time in the history of the world. On December 2, 2010, the Hayabusa project team in the Japan Aerospace Exploration Agency (JAXA) and the 118 companies and organizations received letters of appreciation from the Minister of State for Space Policy and the Minister of Education, Culture, Sports, Science and Technology. ESPEC was also awarded a commendation for its distinguished service in the Hayabusa project.
ESPEC has continued to provide support for the development and reliability of leading-edge technology. We fully intend to continue supporting the development of state-of-the-art technology for a prosperous future.

© Japan Aerospace Exploration Agency (JAXA)

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ESPEC’s Environmental Creation Technology Providing Safety and Peace of Mind to the Aircraft Industry

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Fukuiyama Plant (Opened in 1974)
1-7 Osadano-cho, Fukuiyama, Kyoto. [Total area: 54,822 m² / Factory floor: 18,039 m²]
**PRODUCTS**

* Product photographs are for illustrative purposes only.

**Extra-Large-Capacity Environmental Chamber**
A large-capacity test chamber capable of carrying out tests on large-scale specimens as is.

* Test chamber (Example)

ESPEC operates a full line-up of chambers for carrying out tests that conform to MIL-STD-781, MIL-STD-810, ASTM standards, and so on.

**Temperature Range:** −70°C to +100°C
**Humidity Range:** 30% to 85% rh

**Rapid-Rate Thermal Cycle Chamber**
The chamber is able to perform rapid temperature change tests at both atmospheric temperatures and specimen temperatures.

**Mini Sub-Zero Compact Ultra Low Temperature Chamber**
An easy-to-use and compact chamber enabling tests to be carried out within a wide range of temperatures.

**Temperature Range:** −70°C to +180°C
**Temperature Change Rates:** 18°C/min at +155°C, −45°C
**Inside Dimensions:** W0.8×H0.5×D0.4m

**High Altitude Chamber**
A test chamber capable of recreating atmospheric pressure and temperature changes inherent when flying at high altitude.

**AGREE Chamber**
Carries out AGREE tests not only with temperature changes, but with vibrations at the same time.

**Temperature-Controlled Air Supply System**
A system that provides a wide range of freedom in testing by supporting temperature and humidity tests on specimens of all shapes and sizes, such as tests on localized areas and tests on extra-large specimens.

* ESPEC can also arrange test chambers.

**Combined Decompression and Vibration Test Chamber**
Enables complex environmental tests to be carried in combinations of the three conditions of pressure + vibration + temperature change.

**Vacuum Oven**
This easy-to-use oven is equipped with leading-edge functions, such as programmed operation for automatic control over a combination of pressures and temperatures.

**Temperature Range:** −85°C to +180°C
**Temperature Change Rates:** Heat-up: 5.5°C/min, Pull-down: 2.2°C/min at −58.5°C, +153.5°C
**Inside Dimensions:** W0.4×H0.4×D0.4m

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**Domestic**
- Head Office (Osaka)
- International Sales Dept.
- Utsunomiya Technocampus (UTC)
- Kobe R&D Center
- Fukuchiyama Plant (Kyoto)
- Utsunomiya Test Center
- Toyota Test Center
- Kariya Test Center
- Kobe Test Center

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**Overseas**
- U.S.A.
  - ESPEC NORTH AMERICA, INC.
  - QUALMARK CORPORATION
- China (Shanghai, Guangdong)
  - SHANGHAI ESPEC ENVIRONMENTAL EQUIPMENT CORP.
  - ESPEC ENVIRONMENTAL EQUIPMENT (SHANGHAI) CO., LTD.
  - ESPEC TEST TECHNOLOGY (SHANGHAI) CO., LTD.
  - ESPEC TEST EQUIPMENT (GUANDONG) CO., LTD.
  - ESPEC (CHINA) LIMITED
- Korea
  - ESPEC KOREA CORP.
- South East Asia
  - ESPEC SOUTH EAST ASIA SDN.BHD.
  - ESPEC ENGINEERING (THAILAND) CO., LTD.
- Europe
  - ESPEC EUROPE GmbH

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**Global Network**

[Map showing the global network of ESPEC facilities and offices]
ESPEC operates a full line-up of chambers for carrying out tests that conform to MIL-STD-781, MIL-STD-810, ASTM standards, and so on.

**Extra-Large-Capacity Environmental Chamber**

A large-capacity test chamber capable of carrying out tests on large-scale specimens as is.

- **Temperature Range:** −70°C to +100°C
- **Humidity Range:** 30% to 85% rh
- **Inside Dimensions:** $W2 \times H2 \times D5\text{m}$

**High Altitude Chamber**

A test chamber capable of recreating atmospheric pressure and temperature changes inherent when flying at high altitude.

- **Altitude:** Up to 100,000 Feet
- **Temperature Range:** −70°C to +180°C
- **Humidity Range:** 20% to 95% rh
- **Inside Dimensions:** $W1.5 \times H1.5 \times D1.5\text{m}$
Rapid-Rate Thermal Cycle Chamber
The chamber is able to perform rapid temperature change tests at both atmospheric temperatures and specimen temperatures.

- **Temperature Range**: −70°C to +180°C
- **Temperature Change Rates**: 18°C/min at +155°C → −45°C
- **Inside Dimensions**: W0.8×H0.5×D0.4m

AGREE Chamber
Carries out AGREE tests not only with temperature changes, but with vibrations at the same time.

- **Temperature Range**: −70°C to +180°C
- **Humidity Range**: 20% to 95% rh
- **Temperature Change Rates**: 5 to 10°C/min at −54°C ↔ +125°C
- **Force**: 20kN
- **Frequency**: 20 Hz to 2000 Hz
- **Inside Dimensions**: W1 × H1 × D0.8m

Combined Decompression and Vibration Test Chamber
Enables complex environmental tests to be carried in combinations of the three conditions of pressure + vibration + temperature change.

- **Altitude**: Up to 100,000 Feet
- **Temperature Range**: −70°C to +180°C
- **Humidity Range**: 20% to 95% rh
- **Force**: 30kN
- **Frequency**: 5 Hz to 3000 Hz
- **Inside Dimensions**: W1.5 × H1.2 × D1.2m
Mini Sub-Zero
Compact Ultra Low Temperature Chamber
An easy-to-use and compact chamber enabling tests to be carried out within a wide range of temperatures.

Temperature Range: **−85°C to +180°C**
Temperature Change Rates:

- Heat-up: **5.5°C/min**
- Pull-down: **2.2°C/min** at **−58.5°C ↔ +153.5°C**

Inside Dimensions: W0.4×H0.4×D0.4m

Temperature-Controlled Air Supply System
A system that provides a wide range of freedom in testing by supporting temperature and humidity tests on specimens of all shapes and sizes, such as tests on localized areas and tests on extra-large specimens.

* ESPEC can also arrange test chambers.

Temperature Range: **−70°C to +150°C**
Humidity Range: 30% to 95% rh

Vacuum Oven
This easy-to-use oven is equipped with leading-edge functions, such as programmed operation for automatic control over a combination of pressures and temperatures.

Temperature Range: **+40°C to +200°C**
Pressure Range: **933×10^2 Pa to 1×10^6 Pa**

Inside Dimensions: W0.8×H0.8×D0.8m
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