

Quality is more than a word



COMPANY PROFILE



ESPEC NORTH AMERICA, INC.



Quality is more than a word

ESPEC NORTH AMERICA builds test chambers in the United States as part of the ESPEC Group, which is the largest organization solely dedicated to the manufacture of environmental test and conditioning systems, allowing us to concentrate on quality construction and innovative designs.

ESPEC helps our clients confidently develop products that can safely and reliably carry out their intended use.





Committed to Quality Manufacturing

ESPEC North America continually improves quality, lowers cost, and speeds manufacturing time to better serve our customers.

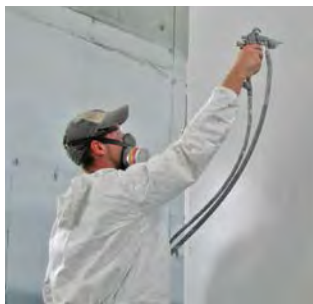
Over 30 years of experience building test chambers in America goes into everything we create, from smaller standard equipment, to large custom chambers. With 'progress to perfection' as our motto, quality is designed into our processes and built into our equipment.

To bring North America the widest selection of test chambers, some models are manufactured at our sister factories in Japan. Started 60 years ago, ESPEC CORP. quality is renowned around the world.

- Standardization — Modular construction and standardized processes have enabled ESPEC to improve quality and reduce costs.
- Lean-manufacturing — Following lean manufacturing principles has increased volume and improved quality.
- CAD/CAM — Metal fabrication at ESPEC is automated based on three-dimensional CAD drawings created by our engineering staff.
- ISO-9001:2008 — Certified manufacturing and non-manufacturing processes at ESPEC North America.
- Specialized facilities — Our 136,000 square foot factory was built in 2003 especially for manufacturing test chambers, and expanded in 2015.



Construction



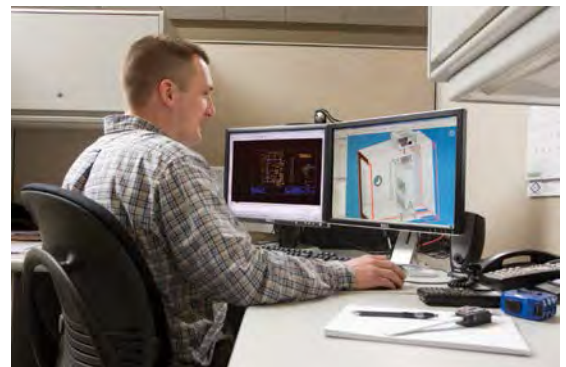
Painting



Electrical



Assembly



Engineering



Widest Selection of Test Chambers

Over 450 standard chambers and ovens, plus custom construction

ESPEC test chambers create environments of hot or cold, dry or humid, as well as cycle between those extremes. The chambers can simulate real situations, or create artificial stress, helping improve our clients' product safety and reliability. ESPEC offers the size and performance you need, from the world's smallest humidity chamber to custom drive-in systems.

Attention to detail shows in our equipment's eye-pleasing looks. But more than just beautiful, our chambers are made to be reliable and easy to use. We are constantly evolving our designs to meet the latest testing requirements and customer expectations.

- Stainless steel exterior on most of our reach-in models for long-term beauty.
- Touchscreen controllers with USB or Ethernet access (on most models) makes our chambers the easiest to use.
- Special thermal breaks around doorframes and other critical locations minimize thermal creep and the potential for frost or condensation on the exterior.
- Exclusive ESPEC OEM parts and monocoque construction improve quality and overall appearance.
- Three levels of overheat protection on all models for safety.
- Wet/dry bulb measurement systems for reliable and easy maintenance on humidity models. (Solid-state systems optional.)
- Willingness and capability to customize and/or integrate other test systems for your application.



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Over 70 Reach-in Models
For Temperature and Humidity Testing



Platinous

ESPEC Platinous models are a great choice for basic temperature or temperature/humidity testing, either steady-state or cycling conditions.

- Stainless steel exterior & interior construction for long life
- Energy-efficient electronic adjusting refrigeration control
- Custom-molded thermal breaks for thermal integrity
- USB upload/download of programs and test data

Platinous Sizes and Capabilities

Interior Sizes	8, 14, or 32 cu. ft.
Temperature Range	up to -70 to 150°C
Optional Humidity	10 to 98% RH
Change Rate	1.5 to 6°C/min.
Models	Twelve

Global-N

The Global-N series comes in two interior volumes, 380 and 800 liters (12 and 28 cubic feet), and require the least amount of floorspace for this level of performance. Models are available with temperature cycling as fast as 20°C per minute.

Global-N Sizes and Capabilities

Interior Sizes	12 or 28 cu. ft.
Temperature Range	up to -70 to 180°C
Optional Humidity	10 to 95% RH
Change Rate	3 to 20°C/min
Models	Thirty-two

ZoneOne

ZoneOne temperature/humidity chambers provide outstanding stability testing performance for manufacturers of pharmaceuticals, biologics, food, and materials.

- Refrigeration configured for frost-free, continuous operation
- Heated, full-view doors for easy viewing
- Horizontal airflow for uniform sample exposure

ZoneOne Sizes and Capabilities

Interior Sizes	28 or 56 cu. ft.
Temperature Range	10 to 65°C
Humidity Range	20 to 90% RH
Models	Two

Platinum

The larger Platinum chambers provide greater performance capabilities, while incorporating the features of our Platinous and Global-N lines. The refrigeration systems on most models utilize modern, high performance scroll compressors that allow a small footprint and fast temperature changes, even with significant test loads.

Platinum Sizes and Capabilities

Interior Sizes	42 or 60 cu. ft.
Temperature Range	up to -70 to 180°C
Optional Humidity	10 to 95% RH
Change Rate	3 to 15°C/min
Models	Twenty-two

Agree

The Agree chamber's flexible design can easily be modified to suit specific applications.

- Temperature changes rates to 25°C/m.
- Removable floor allows integration with vibration shakers, including special design for combo-base systems.



Flexible diaphragm floor for use with vibration shaker.

Agree Sizes and Capabilities

Interior Sizes	15 to 114 cu. ft.
Temperature Range	-70 to 180°C
Optional Humidity	10 to 95% RH
Change Rate	5 to 25°C/min
Models	Six std. sizes



Big Chamber Performance
From **19** Small Test Chambers



Criterion Temperature-only

The ESPEC Criterion temperature chambers provide an economical and space-saving solution for cramped labs needing to do a variety of temperature testing. All Criterion models have a 19.5 inch (500mm) wide interior.

- Space-saving footprint, designed for installation against a wall
- Stainless steel exterior and durable thermoformed plastic door
- Full thermal break around doorframe and door
- One 2" (50mm) diameter cable port, with a flexible silicone plug

BTU/BTZ Sizes and Capabilities

Interior Sizes	1.5 or 4 cu. ft.
Temperature Range	up to -70 to 180°C
Humidity Range	NA
Change Rate	up to 5°C/min.
Models	Five

Criterion Temperature/humidity

Adding to our popular Criterion benchtop series, our humidity models offer the same quality features and expanded capabilities.

The four cubic foot workspace is the largest to be found in a benchtop unit, while requiring less footprint than even smaller comparable chambers. The extended temperature and humidity ranges allow for testing at more extreme conditions.

BTL/BTX Sizes and Capabilities

Interior Sizes	4 cu. ft.
Temperature Range	up to -70 to 180°C
Humidity Range	10 to 95% RH
Change Rate	up to 2.5°C/min
Models	Two

SU Temperature-only

The SU series benchtop temperature chambers are extremely compact, but with a wide testing range. They make it possible for smaller companies and laboratories to perform environmental testing without compromises.

- Touch-screen programmable control with USB and Ethernet access
- Optional viewing window or inner glass door

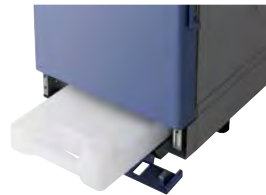
SU Sizes and Capabilities

Interior Sizes	0.8 or 2.2 cu. ft.
Temperature Range	up to -60 to 150°C
Humidity Range	NA
Change Rate	up to 3°C/min
Models	Five

SH Temperature/humidity

The SH series offer accurately controlled humidity testing in one of the smallest test chambers possible. Same as SU series, but with humidity control.

- Accurate wet/dry bulb humidity measurement for easy, low-cost maintenance.



The SH has its own water tank, so no plumbing is needed.

SH Sizes and Capabilities

Interior Sizes	0.8 or 2.2 cu. ft.
Temperature Range	up to -60 to 150°C
Humidity Range	30 to 95% RH
Change Rate	up to 3°C/min
Models	Five

MC Temperature-only

Despite its compact size, the MC series can achieve low temperatures down to -85°C, the lowest in the industry. In addition to the unmatched low temperature range, these models include the P-300 touch-screen programmer from our larger models.

MC Sizes and Capabilities

Interior Sizes	2.2 cu. ft.
Temperature Range	up to -85 to 180°C
Humidity Range	NA
Change Rate	4 or 5°C/min
Models	Two



Thermal Shock Chambers



TSE-11-A Two-Zone

Did you think that getting a thermal shock chamber was too expensive, required special utilities and half your lab-space? The TSE-11 is the solution. Only 26 inches wide, and has built-in air-cooled refrigeration.

- Two-zone elevator style
- Requires no cooling water or liquid nitrogen

TSE-11-A Size and Capabilities

Interior Size	0.4 cu. ft.
Temperature Range	-65 to 200°C
Mil-Std 883 1010.8	up to 4 kg.
Models	One



TSA Two/Three-Zone

The TSA series has just one chamber and no elevator, saving space and cost. Extended testing up to 1000 cycles is possible.

- Preheat/prechill capability speeds recovery time
- Can be used for two-zone or three-zone tests
- Energy saving refrigeration

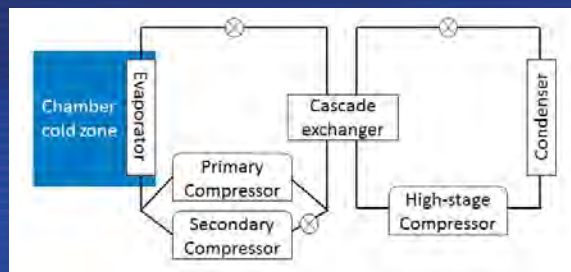
TSA Sizes and Capabilities

Interior Sizes	1.5 to 10 cu. ft.
Temperature Range	up to -70 to 200°C
Test Capacity	up to 40 kg.
Models	Nine

ESPEC Patented Technology Reduces Energy Usage Up To 50%

The TSA series includes a patented "Eco operation mode" that automatically minimizes operation of heaters and refrigeration during standby, prior to switching zones.

Patented parallel refrigeration technology further improves energy savings by pairing two compressors on the low side, so one can be turned off during soaks or standby periods. An electronic expansion valve further improves energy usage and control.



Extreme Temperature Changes From **14** Thermal Shock Models



TSD-100 Two-Zone

ESPEC developed the TSD-100 with a 40% smaller footprint, as well as lowering electricity usage by 60%. The Specimen Temperature Trigger advances the cycling only once the product has reached the desired temperature.

- Two-zone elevator style
- Cooling fan for safer unloading
- Only 44 inches wide

TSD-100 Size and Capabilities

Interior Size	3.5 cu. ft.
Temperature Range	-65 to 200°C
Mil-Std 883 1010.8	up to 11 kg.
Models	One



TCC Rapid Rate Single-Zone

The TCC-150 chamber utilizes a unique specimen temperature control system that maintains linear change rates, even up to 15°C/min. or more. Designed to meet the strict requirements of JESD22 A104D, the TCC-150 also provides uniform temperature exposure on the test load during transitions.



TSB Liquid-to-Liquid

Liquid-to-liquid thermal shock testing provides extreme stress and test-time savings. The chambers require expensive liquids, which our models conserve and recycle, resulting in pay-back in as little as 18 months.

- Robotic transfer mechanism
- Multiple liquid-recovery systems

TSB Sizes and Capabilities

Basket Sizes	0.08 or 0.15 cu. ft.
Temperature Range	-65 to 200°C
Mil-Std 883 1011.9	up to 2 kg.
Models	Two



Custom Drive-in Chambers

Environmental testing of automobiles requires additional consideration of the facility where the chamber will be installed, and its planned use.

Test methods for vehicles can include additional conditions besides temperature and humidity to better simulate real-world conditions.

Panelized Construction

ESPEC North America builds dozens of walk-in chambers every year for top companies testing automotive, electronics, communications, aerospace, and other products.

Our panelized walk-in chambers use urethane-foam panels that lock together during assembly. The panels have a stainless steel interior skin and durable painted-steel exterior.



Panelized Standard Sizes

Interior Sizes	183 to 1372 cu. ft.
Temperature Range	up to -65 to 85°C
Humidity Range	optional 10 to 95%RH
Change Rate	up to 10°C/min

Solid Construction

Standard ESPEC solid construction walk-ins can go up to 150°C to accommodate extreme test conditions (custom up to 300°C). It is the preferred construction type for testing large loads at 85°C/85%, or for cycling faster than 10°C/min.

The chambers are one-piece construction, using fiberglass insulation and an angle-iron frame. The MAP separates from the chamber for easier shipping and installation.



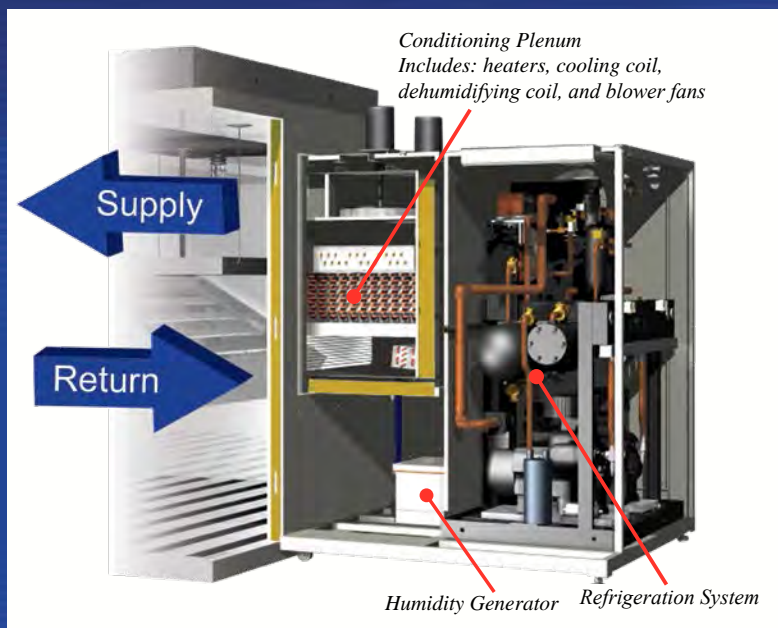
Solid Construction Standard Sizes

Interior Sizes	183 to 499 cu. ft.
Temperature Range	up to -65 to 150°C
Humidity Range	optional 10 to 95%RH
Change Rate	up to 20°C/min

Modular Air Plenum

ESPEC walk-in chambers use our standard air conditioning systems called Modular Air Plenums (MAP). These MAPs are built with the proper heating, refrigeration, and humidity control to achieve your desired performance. The MAP simply rolls-up to an assembled walk-in chamber to complete installation.

- MAP I — Two blower fans and larger 'C-frame' refrigeration layout (shown)
- MAP II — Two blower fans and compact refrigeration
- Stability MAP — Two smaller fans and minimal refrigeration for steady-state applications
- Drive-in MAP — Three blower wheels and larger 'C-frame' refrigeration





Specialized Systems



Highly Accelerated Stress Test

HAST chambers reduce the time it takes to complete humidity testing for semiconductors. By elevating temperatures above 100°C and increasing the pressure, simulation of normal humidity tests can be made while maintaining the same failure mechanisms. Tests can be completed in days, not weeks, compared to traditional 85°C/85%.



Chambers for Solar Panel Testing

Photovoltaic solar panels need to pass strict test standards to ensure their long-term effectiveness. ESPEC solar panel test chambers are sized to fit common module sizes, as well as providing the temperature and humidity performance capabilities that can speed up test time, or conserve energy.



Safety Modifications for Battery Testing

Lithium-ion batteries (and other products) need to be tested with consideration of potential leaking, bursting, fire, or even explosion. ESPEC can modify standard chambers or build custom systems that ensure safe testing.

- Explosion venting
- Non-sparking interior
- Gas detection systems
- Fire suppression systems
- Integration with other test systems



Special Platinous Models

ESPEC has developed special variations on our Platinous temperature/humidity models for specific applications.

- Ultra-view models with a large window, suitable for testing displays
- Clean-room models with class-100 HEPA filter
- Extended range for testing up to 95°C/95%

Standard Solutions for Special Requirements



Rain Simulation

ESPEC's rain/spray test systems have multiple possible features, depending on the type of tests required, such as shower or light-spray, temperature and humidity conditioning, hot/cold water spray, and car wash simulation. Rotating spray heads and tables ensure full exposure.



Environmentally Conditioned Air

For situations where the test sample cannot be placed in a chamber, our Environmentally Conditioned Air (ECA) systems can circulate conditioned air to a remotely located test fixture. In some cases this is accomplished by modifying a Platinous or Global-N chamber, becoming a dual-purpose unit.



Altitude

ESPEC can provide custom-built chambers for simultaneous testing of temperature and low-pressure altitude conditions, up to 100,000 feet. Two common applications are:

- Testing of avionics or other aerospace equipment to simulate actual conditions as might be experienced during flight.
- Simulation of high-altitude conditions that can be found in mountainous regions.

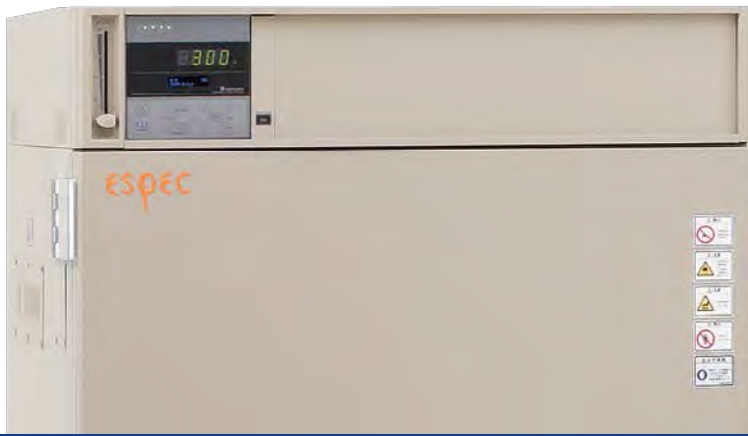


Settling Dust

ESPEC dust chambers provide a ready-made solution to common settling dust test standards for automotive and electronic-cabinet requirements. Often specified for use with "Arizona fine dust," these units can also be used with talcum or concrete powder.

Tensile Test Conditioning

Increased interest in varying temperature and humidity during tensile testing of materials has led ESPEC to develop chambers that fit the unique needs of tensile test machines.



**Over 55 Ovens
with Precise Control**

Industrial Ovens



Standard Oven

ESPEC offers two types of standard models: the space-saving PV vertical ovens and the PH horizontal ovens. Both provide horizontal airflow for even exposure to all samples. Control constancy as low as $\pm 0.1^{\circ}\text{C}$ and uniformity as low as $\pm 0.5^{\circ}\text{C}$ ensures accurate operation.

Standard Ovens Sizes and Capabilities

Interior Sizes	up to 35.3 cu. ft.
Temperature Range	45 up to 200, 300, 500, or 700°C
Models	Nineteen



Rotating Rack Oven

Based on our PH temperature ovens, these models incorporate a rotating specimen rack and are especially designed for accelerated heat deterioration testing of rubbers and plastics including polyesters and vinyl. There are two interior sizes of this model, 3.2 or 7.6 cu. ft.



Anaerobic (Inert) Oven

The IPH models are hermetically sealed ovens, allowing them to be filled with non-oxidizing gas such as carbon dioxide or nitrogen for anaerobic heat treatment or temperature-characteristics testing.

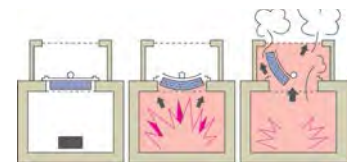
Standard Ovens Sizes and Capabilities

Interior Sizes	7.6 cu. ft.
Temperature Range	up to 45 to 350°C
Models	Two



Safety Oven

These safety ovens, based on our PH temperature ovens, include special features for drying, heat-treatment and temperature characteristic testing of flammable synthetic resins or volatile solvents. Safety features for potential explosive conditions include low temperature heating elements.



An explosion vent in the ceiling allows the explosion to be safely channeled through the top.



Class 100 Clean Oven

These models are used extensively in heat treatment/drying or burn-in of semiconductor wafers, liquid crystals, disks and other components and devices requiring clean air conditions. These units can also be prepared for installation in clean-room environments.

Standard Ovens Sizes and Capabilities

Interior Sizes	up to 27.1 cu. ft.
Temperature Range	45 to 300°C
Models	Eight

Custom Construction for Unique Applications

Custom Chambers

For thirty years ESPEC has been providing custom-designed test chambers for companies world-wide. This experience, combined with our standardized sub-assemblies, provides quick, reasonably priced, and high-quality custom equipment.

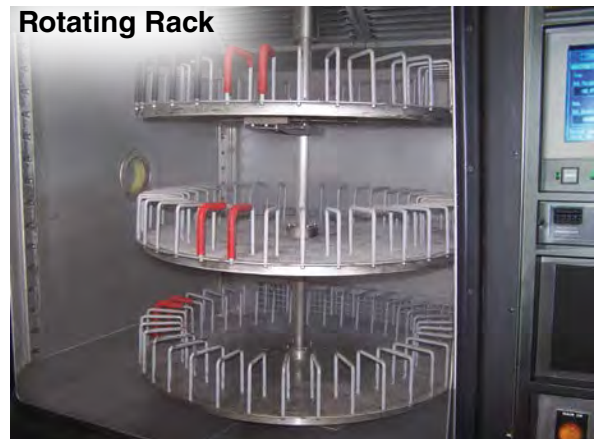
In addition to temperature and humidity control, custom chambers often need to be integrated with other equipment to provide real-world simulation, especially for automotive applications.

Rain Spray Chamber



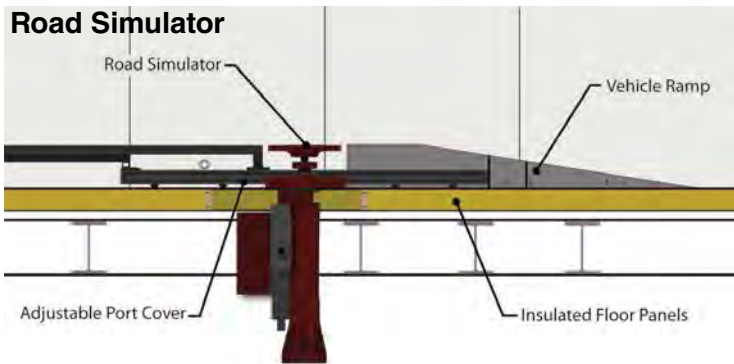
Our automotive clients often have to simulate rain conditions. ESPEC has designed unique rain/spray test systems for components and whole vehicles, including hot/cold water, high-pressure car wash, and road-salt. Moveable nozzles enable targeting spray based on the vehicle model.

Rotating Rack



An electronics supplier needed to lower the cost of a rotating rack system for preconditioning of boards prior to functional testing. ESPEC redesigned the rack system, added control systems to ensure first-in-first-out, and reduced the overall cost by several thousand dollars.

Road Simulator



ESPEC has a unique insulated floor system that allows a road vibration simulator to integrate with a drive-in chamber. This floor moves to allow the simulator to adjust for vehicles with different wheelbases.

Solar Simulation



ESPEC has integrated full-spectrum lighting with our test chambers for automotive and solar panel manufacturers. The high heat created by this type of lighting creates unique engineering challenges to ensure control of chamber temperature.



Customer Support

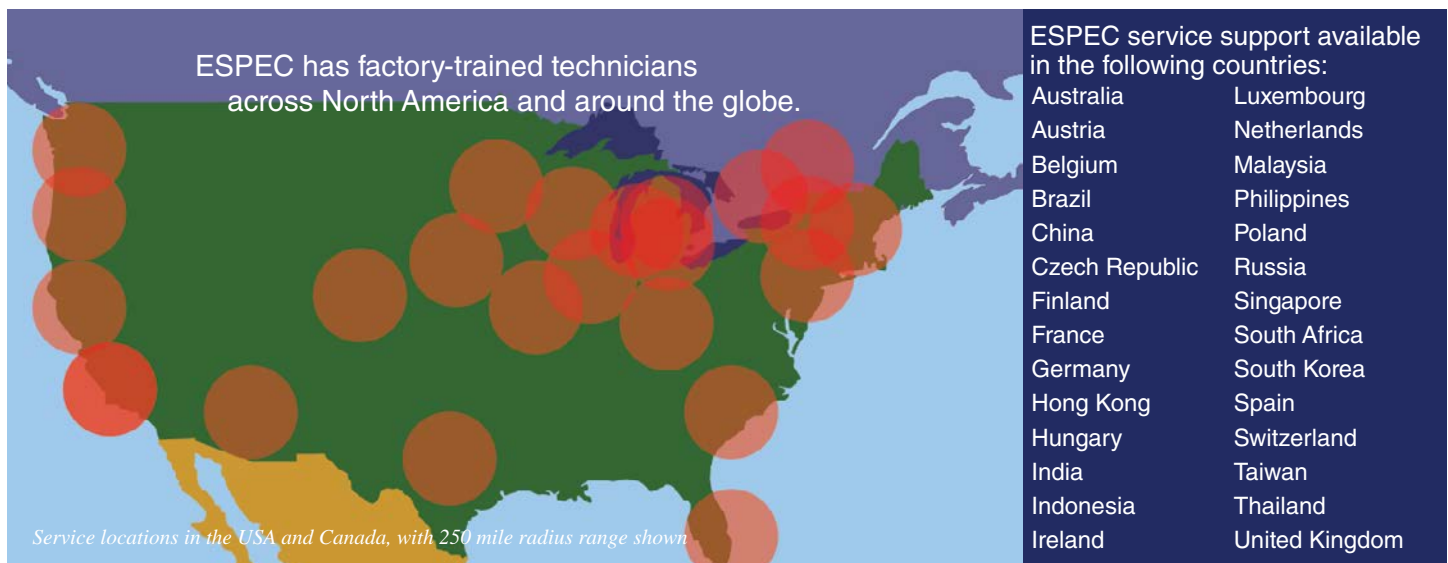
Worldwide Support

The complex control, refrigeration, and humidity systems on a test chamber need specialized care. ESPEC Customer Support helps make caring for these systems as painless as possible.

Centralized phone/email support and parts inventory at ESPEC North America's factory assure fast, helpful response.

Our network of factory-trained field service technicians, both direct staff and experienced contractors, assure flexibility to get your equipment up and running quickly. Repairs are backed by a ninety-day warranty for your confidence.

ESPEC also provides worldwide service support through our sister companies and sales/service agents.



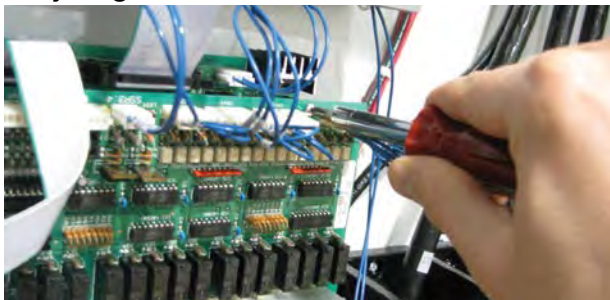


Warranty Support

All ESPEC products include a one year parts and labor warranty throughout the continental USA.

Our warranty covers potentially costly items that others may not, including: windows, refrigerant, and express shipment. No need to secure a PO for uncovered items in a time-critical repair situations.

Easy diagnosis:



Our ESPEC brand controllers are integrated into the complete operation of the chamber. Failures or alarms are much easier to diagnosis and repair with onscreen diagnostic information. ESPEC support staff is available via phone or internet to help with questions or repair diagnosis.

Customer Support Services

ESPEC Customer Support services include:

- Installation
- Training
- Calibration
- Preventative maintenance
- Replacement parts
- Assistance via phone or internet
- On-site diagnosis and repair



World's largest manufacturer of test chambers

ESPEC NORTH AMERICA is part of the world-wide ESPEC Group, the largest organization dedicated to the manufacture of environmental test systems. Our high volume of sales and established reputation allow us to concentrate on quality construction and innovative designs.

In addition to North America, the ESPEC Group manufactures test chambers in Japan and China, as well as sales and service support around the world. Both our U.S. and Japanese manufacturing operations are ISO-9001 registered.



Fukuchiyama Plant



Utsunomiya Technocomplex



ESPEC Environmental Equipment

Global Operations:

- ESPEC CORP., Japan
 - World Headquarters & Manufacturing
- ESPEC ENVIRONMENTAL EQUIPMENT (SHANGHAI) CO.
 - Sales and Manufacturing
- ESPEC SOUTHEAST ASIA SDN. BHD.
 - Asia and Pacific Operations
- ESPEC EUROPE GmbH
 - Europe
 - Middle East
 - Russia
- World-wide dealer and service network



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