

ENSURING A SMOOTH TEST CHAMBER INSTALLATION PROCESS

White Paper



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Abstract

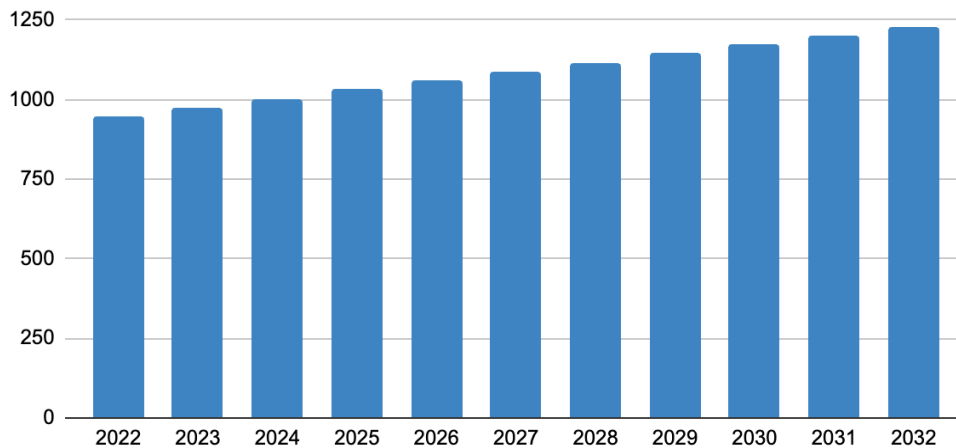


Companies are often anxious and excited to begin environmental testing. They can't wait to test a product's performance and bring it to market. Before testing begins, though, there's a long and critically important journey. To ensure a successful installation process, companies must follow dedicated steps from the beginning of the environmental test chamber purchase to when it's delivered and set up. Associated Environmental Systems (AES) helps guide customers throughout each step of the process. Learn more about what to consider and how to be prepared for every test chamber installation.



Introduction

US Environmental Test Chamber Market 2022 to 2032 (USD Million)



Overall Test Chamber Market

Environmental testing chambers are increasingly in high demand. The [global environmental test chambers market](#) was estimated at USD 946.6 million in 2022 and is projected to grow at a compounded annual growth rate (CAGR) of 3.0% from 2023 to 2030. This rise in demand puts pressure on countless industries, from consumer electronics to pharmaceuticals to aerospace. Global industries rely on environmental testing to test their products. Companies rely on test chamber manufacturers to provide them with a reliable testing solution for their product's needs. From temperature test chambers to walk-in chambers to corrosion test chambers, companies turn to test chamber manufacturers such as AES for their chamber needs.

Identifying the right test chamber is just the beginning, though. Customers often don't realize they need to be mindful of important considerations at each step of the process. When all the details are not laid out prior to the purchase; costly mistakes can easily occur. At [AES](#), each customer is provided with exceptional resources to effectively and efficiently ensure a smooth test chamber installation process. A full-service provider, AES works with each customer to find the [best cost-effective solution](#). We help with installation if your company doesn't have the resources to install the chamber themselves, and we have preventative maintenance programs after installation to keep your chamber in optimal condition and running for 10+ years.



Test Chamber Purchase Considerations



Test Chamber Size and Lab Space

During the purchasing phase, it is important to be mindful of lab space and chamber size. Chambers can be smaller or bigger than anticipated, which is why it is important to understand the dimensions of the chamber fully. Customers should purchase a chamber that can be installed in a safe environment with access to facility power and have at least 12-18 inches of clearance in front and rear of the chamber for ventilation. The chamber should sit on a flat, hard surface with appropriate ambient conditions environment to ensure optimal airflow and temperature. Apart from a general safe space for the chamber to reside, chamber specifications should adhere to all business and local codes as well.

AES strongly believes in lean design and encourages customers to purchase smaller test chambers, such as stackable benchtop chambers, that can meet their testing requirements. This saves the company lab space while maintaining safety and ergonomics. Benchtop test chambers are designed to sit on shelves and tables or can be stacked to maximize floor space. This doubles and triples the amount of DUT that can be tested in the same workspace. Their internal volume typically includes up to 1 to 12 cubic feet of space.

[Optimizing lab space footprint](#) saves time not only when installing but also accounts for future testing. AES can help determine an immediate and ongoing plan for the possibility of future testing to keep your testing on track. A smaller chamber enables the DUT to reach the desired temperature settings in less time. Dependent on customer needs, AES guides the best chamber solution to conserve lab space.



Technology Needs

It's essential to understand the technological needs of each chamber before purchase. Appropriate electrical power and voltage must be supplied to the chamber to avoid malfunctions. The chamber's serial tag located on the back of the chamber describes the proper power information and additional information needed to operate it:

- Model
- Serial Number
- Voltage
- Frequency
- FLA
- Refrigerant Information
- UL Information



Additionally, if applicable, it is important to understand the technological needs of the remote refrigeration or remote air-cooled condenser. Self-contained, air-cooled chambers require an unobstructed flow of air and should be placed no closer than 12-18 inches from walls or any other obstructions. Consult an AES team member to be fully aware of technical specifications.



How to Prepare for Your Test Chambers Arrival

External Temperature

While preparing for chamber arrival, make sure that the lab environment is conducive for optimal performance. The ideal ambient temperature for test chambers is 23°C (73.4°F). The temperature and humidity range of assured performance is between 15°C and 25°C (59°F/77°F) and 30-50% relative humidity. Conditions outside this range have the potential to strongly affect the performance of your test chamber and reduce the lifespan of the environmental testing equipment.

Additionally, it's best practice not to have the room too hot or too cold. If the temperature is not appropriately maintained, the test chamber is stressed to work harder to regulate its workspace temperature. The room's air conditioning system should always have enough capacity to remove the heat if the heat rejection is high. If not, the air conditioning will shut down, increasing the ambient room temperature and causing the equipment not to function properly.

Environmental Test Chamber Placement and Needs

How a chamber is going to fit through the front door and where it's going to be placed are big questions that need answers that are often overlooked. To begin, it's essential to know the unique exterior dimensions of the chamber for clearing doorways. How will the chamber get through the door, and what steps need to be taken to ensure it can come into the building? If the chamber is going to be placed on another floor level, it may need to be brought up by an elevator, which prompts more questions: What is the elevator's max weight, and does the chamber fit through the elevator door?

All AES chambers are shipped on pallets; a forklift will be needed to remove them from the pallet and move them into your building. If the chamber happens to not fit through the front or elevator doors, AES recommends that a loading dock be used to get the chamber inside. In the absence of a dock, a truck with a lift gate is an alternative. This is important information that needs to be provided to AES, as we can help you prepare for equipment rigging, uncrating, and pallet removal, moving of the chamber in the building, and placement of the equipment in a permanent location.

Once the chamber is inside the building, the next step is safely and securely placing it in the lab. Customers should factor in power, water, compressed air, and room for an ethernet cable where the chamber resides. Customers should be mindful not to place chambers in an environment in which the warm air exiting the condenser is restricted. This may cause high refrigeration system pressures and test profile shutdowns. If you have a remote condenser, the condenser must be mounted on a supplied concrete pad or building's roof. For roof-mounted components, ensure that the building roof, roof curbs, and/or structures will support the added load of the components. These components must meet local and on-site codes.

If the chamber will be located in a place prone to earthquakes, be sure to anchor it to the floor using brackets.



Test Chamber Installation Process



Inspecting the Test Chamber

Once the chamber has arrived and is safely placed, the next step is to inspect the test chamber. Check for signs of damage, corrosion, and more. It's best to let the AES team immediately, even if it's just a small crack. A small defect could lead to a much larger problem shortly after. If an AES team member happens to be present (part of our installation add-on option), don't hesitate to ask questions. They can provide training on the equipment, giving each customer expert advice about calibration, maintenance, and more.

Water Input

Before turning on the chamber, it's important to fill the water reservoir. The quality of the water supplied to the test chamber affects its performance. If the water is mineral-heavy, sediment fills up and clogs the test chamber system. However, if the water is too clean or pure, it can strip minerals from the metal as it travels through.

AES recommends that customers avoid double-distilled, triple-distilled, and deionized water. If a customer only has access to tap/city water, they should convert that water to demineralized water using one of AES's water demineralized systems. Recirculating water through the filter removes impurities, preparing the supply water for reuse. Water with high levels of dissolved solids may deplete ion exchange cartridges faster. For more information, AES's [water supply requirements](#) can provide more insight and guidance.



Your Chamber is Ready For Testing



Powering Up the Test Chamber

Once the chamber is unpackaged, securely placed, and supplied with the proper water, the chamber is ready to be powered up. Most of AES's standard chambers are considered plug-and-play, which alleviates stress since the chamber is already tailored to individual building requirements. We recommend that AES customers scan the QR code on their chambers. This QR code prompts you to experience an in-depth, detailed guide to test chambers with a step-by-step process to set up your chamber successfully:

Step 1: Check Power Requirements

Before connecting the chamber to power, check the power requirements. These requirements are listed on the serial tag on the rear of the chamber or in your original sales acknowledgment documents.

Step 2: Find The Ethernet Connection

Plug in the ethernet cable before powering on the chamber. The connection is located on the front or back of your chamber, labeled "Chamber." The cable is designed to connect the chamber to AESONE CONSOLE, a web-based dashboard view that monitors test chamber activity remotely.

Step 3: Turn On the Chamber

Push on the power button to turn on the chamber! It may take the chamber a couple of minutes to turn on, so don't worry if it doesn't immediately activate.



Remote Chamber Monitoring Capabilities

With [AESONE CONSOLE](#), remote test monitoring is possible. Whether you're at a coffee shop or a country away, AES's AESONE software lets you view and operate your chamber on a full-screen monitor on a desktop or using a laptop or tablet. You can view real-time readings, control your chamber's temperature and humidity, see historical data, and stop testing at any time.

The majority of AES's temperature and humidity test chambers come equipped with AESONE CONSOLE. Didn't purchase an AES chamber but want the capabilities? AES has retrofits designed to intergrate AESONE CONNECT into your existing chamber.

If you encounter any technical issues or are interested in this capability for your existing chamber, contact our AES team for live chat support.

Conclusion

Plan ahead with AES. Our team of experts is here to help mitigate test chamber installation issues. From purchase to [ongoing test chamber maintenance services](#), we'll provide you with guidance and support, ensuring you feel confident every step of the way.

Learn more about AES's environmental chambers and how they can provide revolutionary services across industries. [Chat with a sales engineer today](#) to learn more about how AES can make a difference for your lab.



References and Appendix

Grand View Research, [Environmental Test Chamber Market Size, Share and Trends](#)