

The document IS 9002: Part 3 – 1979 (Reaffirmed 2022) specifies the requirement for constructing and operating environmental chambers. Environmental Chambers are of prime importance since they can maintain stable environmental conditions, such as temperature and humidity, and things to be tested or preserved under strictly set environmental settings. Here is what the document encompasses:

## Scope

This guideline is concerning the procedure to construct chambers that can maintain temperature, humidity, and equal pressure if so required. Chambers are essentially intended to test how several products or materials react to specific conditions. The document deals with ensuring these chambers work reliably and consistently.

## Key Terms

With a definition document comes the caveat of defining some of the common terms. Though I was unable to scrounge up all the definitions, here are some of the most likely terms:

1. Humidity: This is the amount of moisture in the air, usually expressed as a percentage.
2. Temperature: That is how hot or cold it is inside the chamber, which should remain constant.
3. Pressure: If the chamber controls air pressure, it's how tightly the air inside is packed.

In these terms, it explains what not to expect from the chamber so that there will be no confusion on the part of the people whenever they will set up or are using the chamber.

### Chamber Characteristics

This section will outline the specifications of what the chamber can do. The basics are:

1. Temperature: The chamber must possess a stable temperature without the tendency to shift its will.
2. Humidity: Ideally, it should be maintaining humidity at the correct level without any variation.
3. Pressure: In case if pressure control is integrated into the system, then it must be reliable and possible to adjust.

## Construction, Workmanship, and Finish

Building the chamber sturdy, using proper materials that don't easily rust or degrade, would be essential. Everything should be assembled neat, smooth finishes all over, and sealed tight to keep the environment stable and clean. The chamber would then be a sturdily built one to last for several years and get the job done.

# Instrument Console

This is that section of the room where you work at. It must be convenient to operate and with no obscurity over instructions very legible displays. Controls need to be plain so nothing occurs in the mind of an operator's mind and it should all be labelled appropriately. In simple terms the console needs to assist operation of the chamber.

# The Chamber

Additional Needs Sometimes a chamber requires a little bit extra. It could involve any or all of the following:

1. Alarms: The operator should be alerted by an alarm if some form of malfunction is sensed, like when it happens that temperature gets too high or humidity too low.
2. Emergency Features: There should be safety features like an automatic shutdown to protect not only the chamber but also the contents in case some calamity were to occur.

# Power Supply Requirement

The chamber needs a constant power supply, and the document mentions how to connect it. It further states that there must be backup power so that even in case of a power outage, the chamber is still operational. The chamber should not be affected by the output from fluctuating power supplies.

# Safety

Safety is an enormous issue. The chamber must be well-insulated to prevent shocks and designed not to overheat or cause other types of dangers. Emergency stops and failsafe systems must also be equipped, so accidents can be prevented. According to the document, everything should be subjected to testing to ensure safety.

# Labeling

The chamber should be fitted with clear, permanent labels. These should include the name and address of the manufacturer, the model number, warning labels about the safety of the chamber (such as "High Voltage"), and how to operate it safely. Labeling lets the operators use the room correctly and safely.

# Tests

The chamber must undergo a series of tests to prove that it meets all the requirements. These include:

Checks the temperature to avoid drifting in conditions and maintains them stable.

# Safety Tests

Check on all the safety features to ascertain if they work as required.

Durability Test: Keep track of how long the chamber can sustain such distressing conditions.

## Instructional Handbook

Each room should contain an instructional handbook. Such a handbook should detail the preparation, use, servicing, and sometimes troubleshooting instructions for the chamber, along with safety.

## Information to be Supplied by the Indenter

It includes information such as what one needs, maybe concerning the range of temperature and humidity, chamber size and any other extra. That is the provision of information that helps ensure the chamber is built to perform exactly what it's intended for