

# Humidity Water Supply And Maintenance

One of the most common options required in an environmental test chamber is humidity. Humidity can have a dramatic effect on materials of all varieties of chemical make-up. Unfortunately, even with the commonplace use of humidity as a variable in environmental testing, the quality of the water supply used is often overlooked.

Water often has a variety of minerals and can even have chemicals added before it arrives via a public water supply. These impurities, over time, can cause damage to a test chamber in the form of blocked atomizer nozzles, corrosion, and even leaks.

We offer a variety of options to help prevent impurities from harming your environmental humidity chamber include using de-ionized water (DI), or de-ionized water filtration systems, and reverse osmosis systems (RO). Each option has its own benefits and limitations.

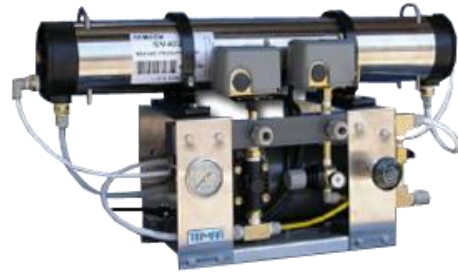
RO systems are very efficient systems that provide a more consistent water quality over DI systems but the hardware and installation have a higher up-front cost. RO systems also last much longer and require less maintenance than DI filtration systems.

The DI filtration system relies on a filter which removes impurities. When a DI system filter has reached the end of its usable life, a quick and easy replacement of the filter will get your chamber right back up and running.

Unlike the RO system, which shuts down when it isn't maintained, a DI system will still allow water to pass through the filter even when spent. A new DI filter is usually dark blue or violet when new and grey or light brown when expended.

In locations where an external water supply is unavailable, a re-circulating DI system can be used. With this system the condensate is collected and reused in a closed loop. As a bi-product of a re-circulating system, any outgassing of tested goods or product particulate that is released into the condensate during testing cycles can be inadvertently drawn into the water cycle.

Depending on the type of foreign material introduced



Reverse Osmosis System (RO)



De-ionization Filter (DI)



Re-Circulating Water Tank Option



into the water, the DI filter may or may not be able to remove the particulate from the water cycle. Careful precautions should be taken to ensure that no cross-contamination of test cycles occurs.

Specific filtration needs should be discussed if a water source has organic, free chlorine and chloramines, or phosphate complexes present. Occasionally checking the resistivity of the water supply can help ensure that no new contaminants are introduced. If you are unsure if this is necessary, please contact CSZ. We have the ability to test a water supply for resistivity levels to ensure that they are appropriate for your humidity test chamber.

The amount of water passing through a filtration system will be what determines how long each system will operate before needing maintenance. CSZ reach-in humidity chambers can typically use between 0.5 GPH and 3 GPH during normal operation while larger chambers can use much more water. Other variables including the test RH, the size of the chamber, size of the heater in kW, and how many and how often temperature and humidity cycles run; all have an impact on how much water is used and consequently how long the filtration system will operate between maintenance windows.

Other critical factors which could affect the performance of your humidity test chamber include maintaining proper water pressure and keeping the humidity sensor clean. Water pressures lower than 25 PSIG for generator/ boiler systems and 10 PSIG for atomizing systems must be maintained via a water regulator. Pressure which exceeds these levels could cause failure of the top or bottom cap of the DI filter and allow the system to leak.

Humidity sensors should be regularly cleaned and calibrated to ensure proper readings and longevity of the sensor itself. It is recommended to clean the sensor tip with alcohol and dry using a dry chamber running at 250°F for 10 minutes.

