# Ways to Prevent Chamber Condensation

Air contracts as it cools. When a chamber is pulling down, it actually causes outside room air to be “sucked” into the chamber workspace. The moisture in the air will be drawn to and freeze on the cooling coil. The moisture will then vaporize into the air when the chamber is heated up and that moisture can end up as condensation on the test product.

Dry Air Purge or Gaseous Nitrogen (GN2) may be used to minimize condensation. Purging the chamber with either of the two maintaining a slight positive pressure on the chamber and minimizes the moisture infiltration into the chamber. The dry air or GN2 contains very little moisture so the chamber air can stay “dry”.

To help avoid condensation on the walls and product with humidity chambers, bring up the air temperature first, let the walls and product stabilize, then raise humidity. If the chamber air temperature and humidity levels are raised faster than the wall and product temperature, moisture will condense on the cooler surfaces. By maintaining the dew point of the air below the surface temperature of the walls and product, moisture will not condense on the surfaces. In most cases you can run a characterization test or two first, to determine how long it takes the largest mass (be it product or wall) to stabilize.

CSZ controllers offer cascade control and guaranteed soak capabilities. A separate sensor can be used to monitor, for example, the product. The controller can be programmed to enable a certain event, only after a certain condition has been met. In this case, we’re telling the controller to delay the ramp up of humidity until the sensor placed on the product reaches a point within x number of degrees of set point.

Cincinnati Sub-Zero