QCT Condensation Tester

The QCT Tests:

- Blistering & water resistance of paint & wood preservatives
- Paint pre-treatments
- Surface cleanliness of metals
- Mold control additives
- Electrical insulations & components
- Waxes, polishes, adhesives

The QCT simulates the damaging effects of outdoor moisture attack by condensing warm water directly onto the test specimen. It is fast, easy to use and affordable.

The QCT uses 100% condensing humidity to simulate and accelerate damage caused by rain and dew on metals, paints, and organic materials. It accelerates over natural exposures by increasing moisture temperature. The QCT has automatic controls to regulate the condensation rate, and allow the cycle to go from wet to dry in a pre-programmed exposure sequence. The QCT replaces water immersion and ordinary (non-condensing) humidity tests.

The Cleveland Society for Paint Technology designed the QCT after four years of study. It was originally called the "Cleveland Condensing Humidity Cabinet". Since 1965, hundreds of laboratories throughout the world have successfully used the QCT for research and quality control, including paint, automotive and appliance manufacturers, oil producers, chemical companies and researchers.

Effects of Outdoor Moisture

Water is a common enemy to most materials. It causes metals to corrode, organics to decompose, and structures to disintegrate.

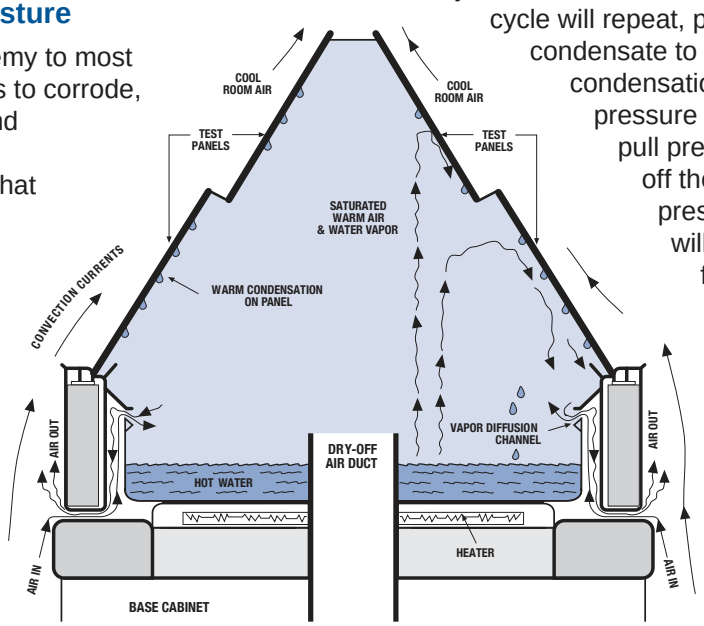
Condensation is water that has been distilled from impure water, mixed with the atmosphere, and saturated with oxygen. Rain, dew, and fog are all natural examples of condensation. This type of moisture has also been called "aggressive water", because it carries oxygen with it as it contacts a material or diffuses through a coating.

How Does the QCT Work?

The QCT tester accelerates outdoor moisture attack, because it supplies controlled amounts of "aggressive water" to the test surface under temperature-controlled, cyclic or constant conditions.

The water in the bottom of the test chamber is heated to generate hot vapor. The vapor mixes with air and fills the chamber, creating 100% relative humidity. Because the test panels are the actual roof of the test chamber, the panels are cooled down by the room air on the outer sides. The resulting temperature difference causes the vapor to condense on the underside of the panels. This condensate is distilled water, which is saturated with dissolved oxygen. A small amount of water vapor escapes through vapor diffusion channels on each side of the QCT unit. Air continually replaces the escaping water vapor, standardizing the proportions of the air mixture.

Condensation occurs first as microscopic droplets. They coalesce into larger and larger drops until they finally run off. Under constant conditions, this droplet cycle will repeat, providing an excess of condensate to the test surface. Constant condensation develops strong osmotic pressure across a coating, tending to pull pressure into the coating. Drying off the test specimen relieves this pressure. One hour of drying will remove most of the water from a 23-hour condensation cycle. These dry-off periods are representative of many service conditions. Transition back and forth from wet to dry is much more important than the length of dry-off time. When a material is dry, very little deterioration occurs. A drying time of one to two hours is usually enough for cyclic operation.



Variable Exposure Cycles

The user is able to program the QCT to create static, 100% condensing humidity or to cycle between hot condensation and dry-off. The temperature's range extends from room temperature to as high as 70°C (158°F). The system allows for the selection of almost any desired wet/dry exposure cycle through an automatic cyclic timer. The cycle options range from the subtle wetness of an almost invisible dew a few degrees above room temperature, to a continuous, high-temperature, running condensate.

Freezing accelerates some failures. For a freeze/thaw cycle, manually remove panels from the QCT while wet and immediately freeze.

Consult the appropriate test procedure for the exposure cycle for your application.

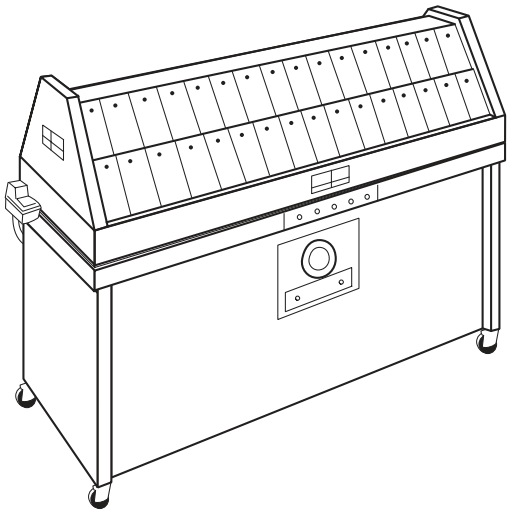
Fast and Versatile

- Screen paints for blister resistance over a weekend at 55°C (130°F).
- Evaluate oil-based rust inhibitors in less than 120 hours at 38°C (100°F) and rate effectiveness of mill-applied oils in only a day.
- Test surface reactivity of cold-rolled and galvanized steel in hours.
- Test wood finishes for moisture and mold resistance (mount painted side down).
- Use as a "blister box" for painted wood finishes (mount painted side up).

Easy to Use, Simple to Install

The QCT provides instant blister or corrosion testing. Just plug it in and add water. Place the unit anywhere in your office, lab, or plant. The heat and water vapor produced by the QCT is about the same as that produced by one additional person in the room.

The test panels on a QCT may be inspected as often as you want, without altering test conditions. Just remove the panel and put a blank in its place.



QCT Tester Conforms with:

- ASTM D4585, Testing Moisture Resistance of coatings with Controlled Condensation
- ISO-6270-1, Paints and Varnishes—Humidity (Continuous Condensation)
- BS 3900, Part F9, Determination of Resistance to Humidity (Continuous Condensation).

Summary

- The QCT is a useful and reliable device for measuring the resistance of coated or treated metal surfaces to deterioration by condensing water vapor.
- There are many additional areas for utilizing the Cleveland Condensing Humidity Cabinet because of its ease of operation and its ability to simulate the destructive effect of condensing water vapor, which occurs in nature or during commercial use of many metallic articles.

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