

Pathfinder Systems, Holland, Michigan 49424, USA

Controlled Curing of Concrete Products

Today we use various processes to heat the products to accelerate the hydration reaction and/or provide a high humidity atmosphere to prevent the concrete drying while curing. This provides us with higher early strengths, less chipping, reduced efflorescence, reduced shrinkage, and a generally better product. However, in many cases, we still do not exactly know all the details needed for the process to work. What's the optimal temperature? Humidity? Should the air circulate? Should we dry the product? How long for each stage of the cycle?



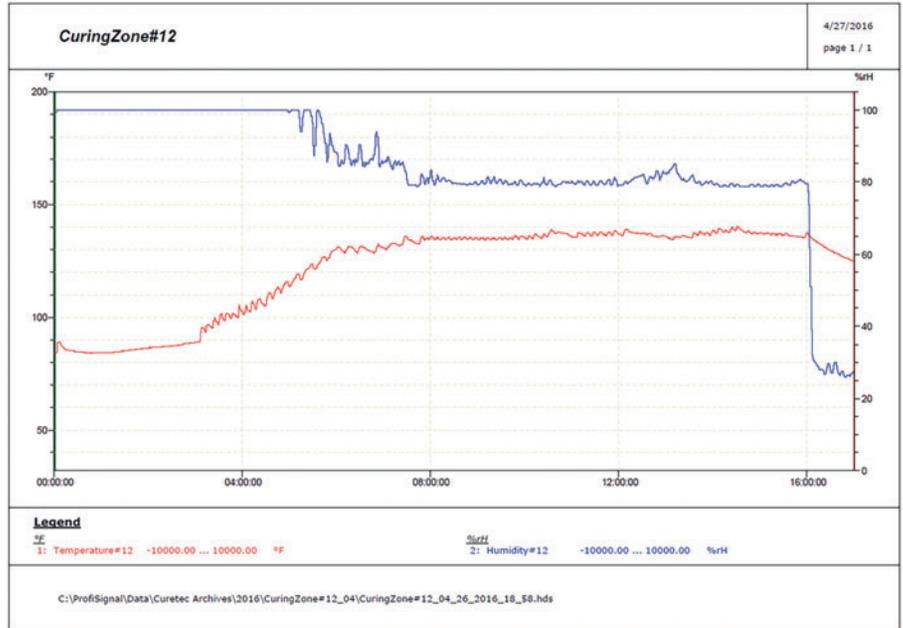
Curing Test Container

Many specialized curing companies now provide equipment, controls, and expertise to the concrete products industry. A lot has been learned about maximizing the desirable properties of the concrete and minimizing undesirable properties through precise control of the curing process. This knowledge forms a baseline to help design the curing system and control the process. Because today's facilities and products are highly individualized, the design of these systems can only be optimized through testing at the actual facility using concrete from the products being produced. This is where a test curing chamber comes in!

The test curing chamber is a portable 20' shipping container with a 10'x8'x8' curing chamber in one half and various curing systems in the other half. The large doors on the container allow new, uncured product to be placed by forklift or by hand into the curing chamber. A temperature probe can be inserted into the concrete at this time. The doors are closed and a curing cycle started. All stages of the curing cycle are precisely controlled.

The curing cycle will usually consist of:

- 1) Preset time with or without misting.
- 2) Temperature ramp-up.



This report clearly shows, on the red temperature line, the pre-set time, temperature ramp up, soak time, and cool-down parts of the cycle. It also shows the effect of the misting system with the blue humidity line.

- 3) Soak time at the desired curing temperature and humidity.
- 4) Cool down and exhaust.
- 5) Drying with heat.

The curing cycle can utilize a steam generator for heat and humidity, a burner for hot air only, high-pressure misting for humidification only, an air circulation system to prevent stratification, and an exhaust system for drying. Various combinations of these processes for varying times can be used to test individual products.

Sensors in the chamber and on the equipment allow precise control and tracking of the curing process. The resulting curing cycles can be printed out or stored on a flash drive so they can be compared with the finished products' test results.

In today's world, you can design a curing system and curing protocols knowing it will maximize the opportunity to make the best concrete products possible.

FURTHER INFORMATION



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