Fogmaster®
APPLICATION NOTE

APN-022: SENTINEL 5850 BARREL ROOM HUMIDIFICATION FAQ

The Sentinel 5850xxH humidification system uses a single atomizing nozzle to deliver a fast moving stream of very small water droplets into the barrel room. Droplets evaporate quickly to water vapor, maintaining room humidity at the set point.

What humidity level can the Sentinel 5850 system maintain?

The setpoint range of the controller is 20-95% RH. Most wineries operate around 70-80%. If the humidity setting is too high, the rate of evaporation is reduced so droplets are more likely to hit something before they evaporate. Also, the temperature-dew point spread narrows as the RH goes up, increasing the potential for water vapor to *condense* on cooler surfaces.

How large a barrel room can the Sentinel 5850 system handle?

The largest installation to date of a standard 1.0 Hp system is a barrel room of 10,000 sq.ft. A larger room may need a second nozzle and slightly larger atomizing air blower, but this depends on the room's design and layout.

What is the water delivery capacity of the Sentinel 5850-H system?

Maximum flow is 5 gallons per hour. Most wineries operate at 1.5-2.5 gph.

How does the Sentinel® nozzle compare to a high pressure nozzle?

Both designs generate water droplets which evaporate to vapor, but they differ in coverage. The Sentinel nozzle discharge extends 50-75 ft. It distributes fog droplets widely to mix throughout the room. High pressure nozzle have a more localized effect – they are usually installed on 8-12 ft. centers throughout the room.

Nozzle design is irrelevant once droplets evaporate; water vapor is a gas and diffuses just like air. The humidity variation inside a barrel room is minor, and usually attributable to temperature. Of course, the humidity level will vary near open doors or vents, where dry air is entering and moist air is escaping.

What about droplet fall-out and wetting?

Wetting is caused by plugged and dripping nozzles, or by large droplets that fall out before they evaporate. Small droplets are preferred because they float longer and evaporate faster. The Sentinel 5850 lets the user control droplet size. (Reduce liquid flow rate to make smaller droplets. Trust the flowmeter, not your eyes; small droplets are almost invisible.)

Doesn't "small droplet" imply nozzle plugging and high maintenance?

It depends on nozzle technology. High pressure, small orifice nozzles are prone to plugging. The Sentinel nozzle uses air turbulence to do the atomizing. Plugging is not a problem.

(Continued ...)

THE Fogmaster® CORPORATION

1051 SouthWest 30th Avenue
Deerfield Beach, FL USA 33442
Tel: 1.954.481.9975 • Fax: 1.954.480.8563
Email: info@fogmaster.com • Web: fogmaster.com

I have hard water. How will it affect humidification?

Hard water is a problem for all humidification systems, regardless of design. It releases dissolved minerals as dust, covering racks and barrels. Dissolved solids can plug nozzles in high pressure systems or build up on the Sentinel nozzle, reducing atomizing efficiency and increasing fog droplet size.

To restore a Sentinel nozzle, soak it in a 10% solution of citric acid, CLR or Lime-A-Way Coffee Maker Descaler for a day or so.

To resolve a hard water problem install a small (50-75 gpd) reverse osmosis system. [A water softener does not solve the problem of dissolved minerals; it merely exchanges calcium or magnesium ions for sodium ions in the liquid.] Under-counter RO systems are sold at Lowe's and Home Depot for about $200.

Can I control a Sentinel system with my refrigeration controller?

Yes. The "E" variation of the Sentinel system (5850xxE) can be controlled by any device able to close a switch. The "H" version (5850xxH) is a stand-alone product with built-in humidity controller.

Will humidification "play nice" with my refrigeration system?

The cooling system should be designed for the humidity conditions in the barrel room. Otherwise, it may work to *dehumidify* it. (Water in the condensate drain line is a signal of dehumidification.) Ways to remedy this problem include:

- Increase coil temperature
- Disconnect (or bypass) the reheat section
- Reduce ventilation
- Raise the temperature differential to 8-12°F
- Replace the expansion valve with one designed for your operating conditions.

Where should I install the nozzle, the blower, and the controller?

Start with the nozzle. Put it at the end of a major aisle so fog droplets can mix freely with room air and evaporate to vapor. It is helpful if the fog discharge "covers" door openings or other locations where air is exchanged with the outside. If you maintain humidity in these areas, the rest of the room will take care of itself.

The controller and the atomizing air blower can be put wherever convenient for you. Consider the locations of existing water and electric service, and the routing of the air line to the nozzle.

Can I put the blower outside the building or in an adjoining room?

Yes. It should be protected from rain. You must cut an opening for the air supply line to the nozzle and for the intake air line to the blower.

Where can I get more information?

A Fogmaster white paper, "Winery Humidification Backgrounder," has more information for people considering humidification system. For a copy, contact Fogmaster Customer Service.