

This overview is directed to winemakers considering fogging water to maintain humidity in the barrel room.

Fogmaster entered the market for barrel room humidification in 2000, delivering prototype humidification systems to six cooperating wineries. They had barrel rooms of 600-3,600 sq. ft., ceilings of 12-20 ft. and humidity goals of 75-84%. All rooms reached their target humidity level within 2 hours of startup. Thereafter the humidification systems operated 10-15% of the time (3-4 minutes in 30) to replenish water vapor losses.

Enhancements to the Sentinel® 5850-H humidification system since then include built-in humidity controller, do-it-yourself installation, brushless motor and quieter operation. Today, the 5850 is delivering reliable humidification for users on four continents.

- The benefits of barrel room humidification are improved quality; better control of alcohol levels; and reduced topping losses. One customer (600 barrels in storage) saw topping losses drop from 8 to 4 percent per year. The savings in labor and increase in saleable product gave a quick return on his investment.

Your mileage will vary, depending on your set-up, the value of your product, and your loss experience. But if topping losses exceed 5% you should run the numbers.

- Most wineries set a target humidity in the 70 - 80% range. A few, with “tight” barrel rooms and infrequent door openings, use a slightly higher RH setpoint (80-84%).
- The rate of water vapor loss is the biggest determinant of success. If vapor losses are high, the humidification system must run longer to maintain the RH at the setpoint; if losses are too high, the system may not be able to keep up.

Water vapor losses can arise both from the design of the barrel room and the way it is used. For example, night air cooling brings in cool (but usually dry) outside air while venting humidified inside air. In/out traffic and door openings let inside air escape and outside air enter. The humidification system must replace these losses to maintain the humidity target.

- Hard water is a challenge for all humidification systems, regardless of technology. Problems include boiler scale; dust from dissolved minerals on barrels and racks; plugged nozzles; wet spots from dripping nozzles; and high maintenance costs.

A water softener does not fix these problems; it merely exchanges dissolved calcium and magnesium salts for sodium salts, but these still produce dust and plug nozzles.

A small reverse osmosis unit on the humidification system feed water line removes these metallic compounds and will remedy the problems of hard water.

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- The minerals in hard water do not plug the Sentinel nozzle – its minimum opening is nearly 1/8 inch – but they will gradually reduce atomizing efficiency. Soak the nozzle in a 10% solution of CLR or Lime-Away for a day or so to restore it.
- Fog nozzles should be installed where they can easily be reached for maintenance, particularly in a winery that has hard water. A dripping nozzle 20 ft above the floor can be a big headache.
- Condensation can be a major contributor to humidity loss. Remember, water dripping from fermentation chiller coils, or running down the refrigeration drain line, or beading up on cold metal grates and doors, started out as vapor – humidity. Condensation losses must add to the demands on the humidification system.
- If refrigeration is installed, it should be designed for the desired humidity condition in the room. Otherwise, the chiller system could cool the air cooled below its dew point,¹ *dehumidifying* it. Sometimes only a simple change is needed for refrigeration to "play nice" with humidification – a different orifice to increase the coil face temperature, and possibly a change of fan motor or pulley ratio to increase air flow. A window air conditioner does not have this flexibility.
- Case goods and flat cardboard are best stored *outside* the barrel room. They absorb moisture, which weakens both fiberboard and glue.
- Wineries that host winetastings or other events in the barrel room don't want equipment noise to intrude. Although the humidification system is fairly quiet, some wineries may turn it off for events. Fortunately, this doesn't have a major impact as the humidity level is quickly restored.
- A recurring question is "What size barrel room does the Sentinel 5850 system handle?"
The largest Sentinel barrel room installation to date is 10,000 sq.ft. A standard one nozzle, 1 Hp Sentinel 5850 is maintaining 78% RH without difficulty.
The question more important than size, however, is what's the water loss rate. A small room with significant losses may easily require more humidification capacity than a large one with limited losses.

¹ A Fogmaster white paper, "APN-008_Winery_Humidification_Backgrounder" provides more detail about humidification, including humidity terminology, calculations of temperature, humidity and dewpoint and the design, management and operation of humidification systems. A PDF copy is downloadable from the Sentinel 5850 web page. For a print copy, contact Fogmaster Customer Service.