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# HUMIDITY CONTROL IN ALCOHOL PRODUCTION

By SteamOvap Technologies Inc.



## WHAT IS THE ANGEL'S SHARE?

Angel's share is the amount of an alcoholic drink (such as wine or cognac, brandy, or whiskey) that is lost to evaporation when the liquid is being aged in porous oak barrels.

Barrels "breathe". They are watertight, but molecules of water and ethanol will move in and out. If the microclimate within the barrel changes due to external temperature or humidity changes, the pressure within the barrel will change as well.

The loss of alcohol due to the angel's share can vary from 2% in cool and wet Scottish climate and up to 10% for Whiskey distillery in hot and drier climate of Southern USA such as Kentucky.

This alcohol evaporation will affect not only the color, nose, palate and finish of the wine and spirit it will also affect alcohol content and at all time affect loss of high value products for the producer.

For wineries, High evaporation rates will also result in frequent topping of wine increasing the risk of breaking of vacuum, more frequent uptake of air will increase the rate of oxidative maturation. Low evaporation rate is resulting in less frequent aeration, thus giving better protection against fast oxidative ageing and resulting in better quality of wines.

### WHAT'S INSIDE THIS ISSUE:

What is the Angle's share?

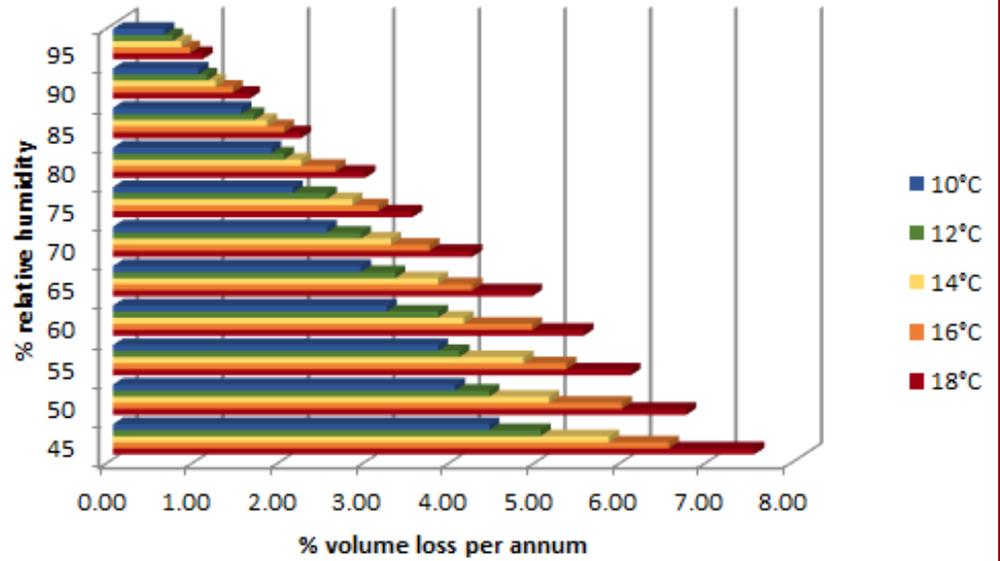
*2 controllable parameters*

*Why dry fog humidifier is the must?*

*ACA humidifier from steamOvap*

## 2 CONTROLLABLE PARAMETERS

Many studies have confirmed that the 2 main controllable parameters are temperature and relative humidity level.



**HUMIDITY CONTROL is twice more important than temperature control.**

Contribution of humidity control is more than twice important than temperature control in the reduction of the angel's share.

Best conditions to minimize the angel's share are 90 to 95%RH and temperature between 10 to 16°C.



## WHY DRY FOG HUMIDIFIER IS THE MUST?

This very specific application does require the smallest size of water droplets to be atomized into the air in order to avoid any wetting or uneven humidity distribution inside the cellar. Wetting of surfaces would cause unfavourable conditions leading to mould growth on barrels and cellar walls.

Dry fog atomizing humidifier along with air cooling has been proven for years to be the most appropriate and cost effective way to achieve the ideal condition to reduce the angel's share for wineries and distilleries all over the world from France to South Africa or California.

This technology is producing a dry fog of 2 to 5 micron water droplet through atomizing nozzle using compressed air to break off water in millions of fine particles.

Ultrasonic humidifier technology also producing a dry fog of 1 to 3 microns water droplets would have been a good choice, however it would results in very high initial investments and operation cost, because cellar can be very large rooms with very high ceiling requiring large humidification loads. Also this type of humidifiers requires the use of pure water.

High pressure atomizing humidifiers using high pressure electric pumps are producing larger size of water droplets of about 10 to 40 microns (10 times bigger). For this reason they are more prone of uneven distribution and of risk of wetting on cellar or barrel surfaces. Those risks will increase exponentially as the temperature is decreasing and relative humidity increasing above 90%RH.



## ACA HUMIDIFIER FROM STEAMOVAP

**ACA** dry fog atomizer humidifier from steamOvap is made of large orifice patented nozzles using no moving part; this means no service required and able to operate with untreated water.

The nozzle's patented acceleration chamber creates a special airflow pattern reaching supersonic speed. This airflow sucks in water from a venturi column; this effect is producing a solid cone jet of micro-droplets which evaporates quickly into the air.

Large orifice of nozzles allows to use water of 100ppm TDS (total dissolved solids) or less.

The **ACA atomizing dry fog humidifier** is requiring offers the lowest compressed air consumption of the industry. Payback (including the cost of air compressor) has been calculated as less than 6 months for most wineries.

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**Installation of one of the above humidifiers will bring you the following benefits:**

- Immediate and dramatic reducing the angel's share
- Reduction of topping
- Low management costs
- Increase wine quality or spirit flavor overtime
- Payback in less than 6 months
- True Dry fog = No risk of wetting
- Low energy usage
- Accepts untreated water



# HOW STEAMOVAP CAN ASSIST YOU?

*Partner, Bernard Saint-yves*

Whatever the size or the configuration of your project, steamOvap will be able to provide you with humidity control and humidifiers that will allow you to achieve optimal humidity levels for your use.

We are a Canadian manufacturer of humidifiers, as such we offer adiabatic humidification solution with dry fog atomizer (**ACA** model) using patented nozzles or evaporative (**AEM** model) using unique UL green guard gold certified media; we do also offer isothermal electric humidifier (**IER** model) that will produce clean and sterile steam with variable and very precise output to +/- 1%RH.

steamOvap's technical team has already helped many consulting engineers, HVAC contractors and building owners to solve their humidification problems such as wetting issues, under or oversized systems, energy traps, and others.

**Contact us** if you are designing a winerie installation, if you are experiencing troubles with low humidity levels or you need to save on energy bills.

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## **Short list of wineries using already the ACA Dry Fog:**

- *Robert Modavi, Oakville CA94562, USA*
- *Château Margaux, 33460 Margaux, France*
- *Vina Concha y Toro, Pirque Santiago del Chile, Chile*
- *Cave de Tain, 26600 Tain l'Hermitage. France*



**STEAMOVAP**