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## From Experience

### Condensation: A Condensed Primer

Whether lurking in corners or lingering on pipes, moisture can be found within many processing facilities. Choosing a successful and cost-effective condensation control solution begins with an understanding of how and why condensation forms.

Air has the ability to absorb or be saturated with water vapor, but only to a limit referred to as the dew point temperature. Moisture in the air beyond the dew point condition cannot be absorbed and will precipitate in the form of room fog or surface condensation. The level of saturation of the air is reported as Relative Humidity (RH). Fully saturated air at its dew point is said to have 100% RH. Less saturated air, measured in grains or pounds of moisture in the air, is reported as a percentage of the humidity "relative" to the moisture content of the air at full saturation. Whenever the temperature of a surface is at or below the dew point temperature of the surrounding air, condensation will form on that surface (e.g., a foggy bathroom mirror or condensation on the surface of a cold drinking glass).

If your facility is experiencing a condensation issue, consider these key questions before attempting to solve the problem:

1. What are the sources of moisture (e.g., wet floors, roof leaks, open dock doors, steam leaks, percent RH of the room air?)
2. What are the surface temperatures where condensation occurs?
3. How do the conditions found in 1 and 2 vary during the course of the day?

Once the answers to these questions are documented, you will be better equipped to find the most cost-effective solution for the problem.

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#### EXPERIENCE IN BRIEF

As a rule of thumb, plan to provide 10 tons of refrigeration for every 1,000 cfm of outside air cooled to 40°F during the summer.

Condensation "Dew Point (°F)" for 100% RH	Condensation Chart		Air Moisture Content lbs/lb dry air
	Room Temperature (°F)		
	at 80% RH	at 50% RH	
50°	56°	70°	0.0078
41°	47°	60°	0.0055
32°	37°	50°	0.0038
24°	28°	40°	0.0026

*As shown in the table above, air at 70°F can retain almost twice the moisture of air at 50°F. Consequently, air cooled from 70°F down to 50°F may become fully saturated with moisture, reach its dew point, and release moisture in the form of condensation.*

## CONTINUING EDUCATION

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- Check out the archive! "Beyond COVID-19: The Future of Food Plants," a Hixson **Food Plant of the Future** webinar. Click to view [here](#).

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## CONTACT US

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