Candy Confections Distribution Center

Facility managers in large candy distribution and packaging operations are often asked why they intentionally put packaged candy into a hot, humid room for two to three days. The answer is graining, a controlled process that stabilizes certain candies and ensures consistent texture, appearance, and shelf life. The typical graining room is hotter than 100 °F with 60% relative humidity. These conditions favor sugar crystallization and moisture redistribution, which are especially important for sugar-based candies, fondants, creams, and similar products where texture depends on crystal structure.

The difference graining makes

A handful of this candy company's brands[1] are packaged in a not-yet-ready-to-enjoy state. Some taffies, for example, are safe to eat before they go through the graining process, but most people would be disappointed the moment they opened the package. Instead of a rich, matte appearance, the candy would be so shiny that it looked wet, and it would stick to the wrapper. Instead of breaking after just a short pull, the candy would stretch like a rubber band and spring back when released. Biting off a piece and chewing it would be accomplished only with great effort.

Through graining, these taffies transition from a glassy, amorphous sugar solid into a microcrystalline-reinforced viscoelastic candy, trading rubber-band stretch for a soft, creamy chew.[2]

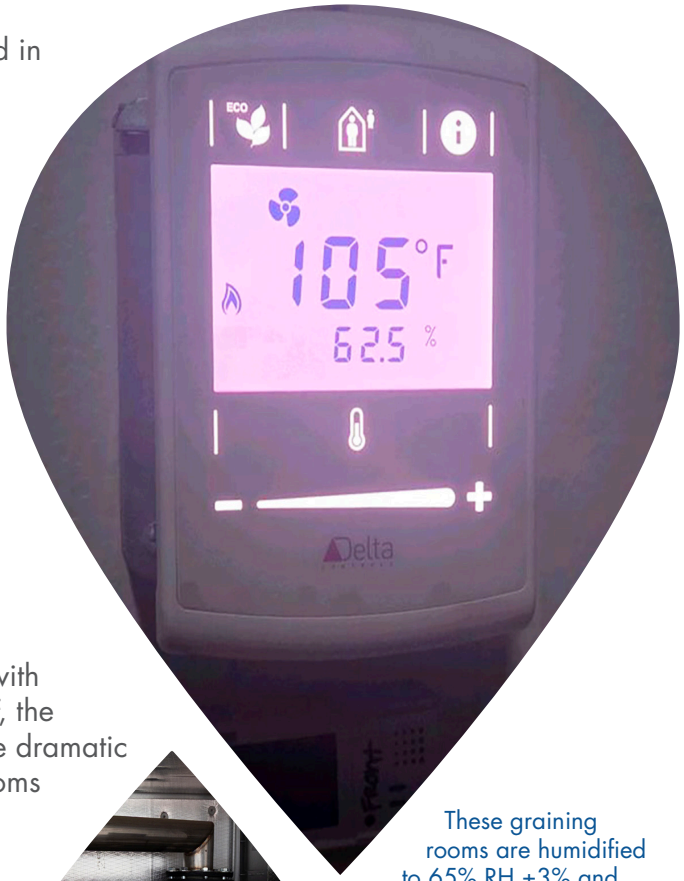
The difference heat makes

At 60 °F, the air in a 12,000-square-foot graining room with a 30-foot ceiling can hold 36 gallons of water. At 105 °F, the same volume of air at can hold 140 gallons of water. The dramatic increase in moisture holding capacity is why graining rooms are so hot.

The difference relative humidity makes

Relative humidity governs water activity at the candy surface, which in turn controls when, where, and how sugars crystallize. While temperature speeds reactions, relative humidity decides the outcome.[3]

Three DriSteem gas-to-steam (GTS) humidifiers reside on the rooftop of the distribution center, but only two of them produce steam at any given moment. The third humidifier is always on standby in case one of the two stops unexpectedly or is taken offline for schedule maintenance.



These graining rooms are humidified to 65% RH ±3% and heated to 105-110 °F.

DriSteem GTS® LX-500 humidifiers paired with Ultra-sorb® LV steam dispersion panels provide humidification for the graining rooms.

Three GTS LX series humidifiers were shipped preassembled and preplumbed in temperature-controlled outdoor enclosures to occupy a small slice of the distribution center's million-square-foot rooftop.

A visit to the graining room

On a cool spring day, the Director of the distribution center brought a visitor up two flights of ladders and out onto the rooftop of the sprawling building to see one of the humidifiers. The two then climbed down and walked to the graining room below the humidifier location.

"Brace yourself," warned the host as he swung open the insulated door to the 12,000-square-foot graining room, and the two stepped inside. The visitor's glasses fogged up, and he inhaled air so thick he could feel its texture as it entered his lungs. A forklift bearing a pallet of candy entered through a 10-foot-high, overhead door. As the forklift cleared the jamb, the door came down at three times the speed of a typical overhead door, so only a small amount of heat and humidity escaped.

Shelves from floor to 30-foot ceiling were filled with hundreds of pallets containing thousands of cases of packaged candy. As Day 3 pallets were removed, new pallets arrived for Day 1 of their three-day stay.

Counting off the years three days at a time

The graining room humidifiers have been running since 2021. DriSteem is proud to provide humidification for the most critical process in some brands' last stop before distribution.

RESOURCES

Find your local DriSteem representative:
https://www.dristeem.com/find-a-rep

GTS humidifier LX series:
https://www.dristeem.com/products/steam-generation/gts-humidifier-lx-series/

Outdoor enclosures and weather covers:
https://www.dristeem.com/products/all-products/other-products-accessories/outdoor-enclosures-and-weather-covers/

Ultra-sorb LV steam dispersion panels:
https://www.dristeem.com/products/steam-dispersion/ultra-sorb-model-lv-lh-steam-dispersion-panel/

DriCalc®, free sizing and selection software:
http://www.dristeem.com/register-for-dricalc

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NOTES

1. Company name and candy brands are withheld by customer's request.
2. The Sweet Science of Sugar Crystals (2024). Laura Rutherford. The Sugar Association. https://www.sugar.org/blog/the-sweet-science-of-sugar-crystals
3. Efe, N. (2022). Sugar-based Confectionery and the Importance of Crystallization. European Journal of Food Science and Technology, 10(3), 1–12.