

Condensation Control for Poultry Processing

Desiccant dehumidification is used to prevent condensation from forming, eliminating product contamination from dripping.

The Problem:

Poultry processing facilities strive to maintain an extremely clean processing environment. To accomplish this thousands of gallons of water are sprayed on a daily basis. Temperatures are maintained at approximately 50°F to prevent microbial growth. Although much of the water is drained away a considerable amount evaporates and becomes water vapor. This water vapor often drifts upwards and condenses on surfaces such as ceilings, structural steel and piping. Per USDA FSIS directives this condensation is not allowed to drip onto the product and is not allowed to form either in product or non-product areas. Until now the only solution was to spend considerable time and effort “controlling” it with plastic sheeting and personnel dedicated to wiping away condensation as it formed. Even with these efforts plants can be overwhelmed by uncontrolled humidity, possibly facing USDA actions if not corrected.

The Solution:

Munters Condensation Control System (CCS) provides a dependable, cost-effective solution to this condensation problem. Munters’ desiccant humidity control technology provides consistent moisture removal capacity, even at low humidity (dewpoint) levels.

With Munters equipment, the moisture in the air is removed by using a desiccant. The absorption process is not limited by the freezing point of water because moisture is removed as a vapor. As a result, the Munters desiccant system can remove as much moisture as necessary to maintain the low dewpoint levels required to prevent the formation of condensation.



Munters Condensation Control System

Desiccant Dehumidification for Poultry Processing



BENEFITS

- USDA Compliance
- Reduced Manual Labor
- Reduced Pulldown Time/ Increased Production
- Reduced Microbial Count
- Reduced Defrost Cycles
- Improved Temperature Control/Reduced Refrigeration Load
- Worker Comfort

The Benefits of Condensation Control with Desiccant Dehumidification

1. USDA Compliance

Increased pressure is being placed on poultry processors to control overhead condensation. Desiccant dehumidification systems will eliminate condensation-related Non-Compliance Records (NRs). Even a temporary shutdown has significant financial implications.

2. Reduced Manual Labor

Most poultry processing facilities employ “wiper crews” to remove condensation. These workers are trained to spot condensation droplets as they form and wipe them away using a long handled mop. Additionally, considerable labor hours and material costs are expended daily to tear down and re-hang heavy plastic sheeting during the sanitation period. This sheeting is used to divert condensation away from the product line to avoid adulteration. These costs can be significantly reduced or eliminated when desiccant dehumidification is used to control condensation.

3. Reduced Pull Down Time / Increased Production

Typically a poultry plant conducts sanitation during a third shift. Large volumes of water are used during this shift to clean processing equipment and production lines. Common practice in a poultry facility requires the plant to discontinue sanitation 1-2 hours prior to shift start in order to swap out sanitation hoses for mops. The entire sanitation crew becomes a “wipe down” crew in order to dry every wet surface. Using desiccant dehumidification during sanitation reduces or eliminates the need for this wipe down period. The result is that you will be able to reduce the labor required for sanitation or be back on line quicker increasing your available production time.

4. Reduced Microbial Counts

A reduction in microbial counts as

a result of desiccant dehumidification is not uncommon. The increased amount of allowable time for sanitation and the reduction in condensation itself provide less breeding opportunities for microbial formation.

5. Reduced Defrost Cycles

By delivering air at lower dewpoint temperatures, desiccant dehumidification systems enable the existing cooling based equipment to defrost less frequently (if required at all). In many instances the defrost frequency is reduced from 4 times to once per day. This saves energy while reducing the amount of re-entrained water vapor that is inherent to defrosting of cooling based systems.

6. Improved Temperature Control

Since desiccant dehumidifiers specifically target moisture (latent) loads, systems that incorporate desiccant units allow the operator to decouple the latent and sensible loads in his facility. Sensible loads are addressed by the system’s cooling equipment while the desiccant section tackles the latent component of the total load. Therefore, the cooling system does not have to come ON to respond to a latent load increase and then reheat to the desired space temperature. This separation of duties promotes tighter temperature control in the space.

7. Reduced Refrigeration Load:

With the removal of latent loads from the system the overall load on the refrigeration can be reduced.

8. Worker Comfort:

Without desiccant dehumidification humidity levels are often close to 100% RH at 50°F. With desiccant dehumidification installed the space humidity level drops to a much more comfortable 60-80%.

Our Dehumidification Technology

Munters equipment removes moisture from air by using a desiccant - a material which easily attracts and holds water vapor. Desiccant dehumidifiers are especially well-suited to removing moisture from air at low temperatures and low humidities.

In Munters units, the desiccant is impregnated into a corrugated ceramic composite material which is formed into a wheel. Air passes easily through the flutes, contacting the desiccant. The wheel rotates slowly (6 to 10 rph) between two air streams. The incoming process air stream - the larger one - gives off its moisture to the desiccant. The process air is dry as it leaves the wheel. The humidity-laden wheel rotates slowly into a second, smaller airstream which has been heated.

This smaller exhaust airstream – called the reactivation air – warms the desiccant. The warmed desiccant gives off its moisture, which is then carried away by the reactivation air. The newly dried desiccant material is rotated back into the process air, where it absorbs moisture once again.

Desiccant Rotors

The diagram illustrates the operation of a desiccant rotor. It features a central red corrugated wheel mounted on a drive motor. Two air streams pass through the wheel: a larger blue arrow labeled 'Process Air' enters from the right, and a smaller blue arrow labeled 'Reactivation Air' enters from the top left. The 'Process Air' exits as 'Wet Air' on the right, and the 'Reactivation Air' exits as 'Dry Air' on the left. A small red circular inset shows a close-up of the wheel's surface, with a caption: 'Patented HoneyComb wheel design provides a vast surface area for desiccant.'

In the 1950's Munters invented modern industrial dehumidification when it introduced the self-regenerating desiccant rotor, the heart of the dehumidifier. Today, Munters offers rotors with five desiccant formulations and is the acknowledged expert in the integration of rotors into dehumidification systems and air handlers.

Munters Corporation
Tel: (800) 843-5360
E-mail: dhinfo@munters.com
www.munters.us

