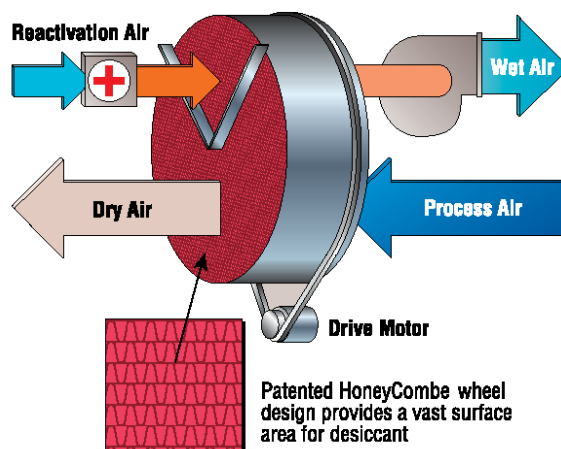# DEHUMIDIFICATION SYSTEMS

Automated Ingredient Systems Dehumidification systems eliminate the problems associated with moisture in bulk storage and pneumatic conveying systems cost manufacturers thousands of dollars every year in lost production due to maintenance related downtime and lost, or unusable products. Excessive moisture inside storage silos can create a multitude of problems ranging from build up on silo walls that reduce usable storage capacity to mold development that can contaminate a final product. High moisture levels inside a conveying line contribute to the increase in product build up on the interior of receiving vessels as well as convey lines themselves. Lumps of product that break off from the sides of the vessel can cause damage to downstream equipment resulting in additional maintenance costs and downtime. When scaling ingredients, build up can result in inaccurate weighments that compromise the batch integrity of the final product. AIS can help you solve these problems by designing a dehumidification system to meet your needs.

STORAGE SILOS

Problems inside storage silos are caused by moisture levels that enable the air inside the silo to be at, or close to the dew point. When this happens the moisture in the air will condense on the silo walls, which are typically at a lower temperature than the dew point. Though it is most obvious during the spring and fall when large temperature variations cause the temperature to fall below the dew point nightly, condensation occurs inside storage silos year round.

By dehumidifying the void space above the product level inside the silos you effectively prevent condensation from occurring. Once the ambient air is passed through the dehumidifier the void space is supplied with a blanket of air with a dew point substantially lower than the current temperature. Because outside air is being dehumidified, the cushion is maintained regardless of the change in temperature that may take place.

Reactivation Air

Wet Air

Dry Air

Process Air

Drive Motor

Patented HoneyCombe wheel design provides a vast surface area for desiccant

Automated Ingredient Systems, L.L.C.

Product knowledge is especially important when attempting to pneumatically convey dry ingredients. Some products convey fine at ambient moisture levels. Some products are very hygroscopic and benefit greatly from the use of a dehumidifier at the inlet of the system. By using dehumidified air for conveying you can eliminate one variable that will affect the efficiency with which your system operates.

Another factor that has to be considered when designing a dehumidification system is temperature. When dehumidifying the inlet air to a pneumatic conveying system it is commonplace to use pre-cooling, and, or post-cooling coils.

By using cooling coils with a desiccant dehumidifier you achieve a lower unit leaving humidity and outlet temperature. In a pressure system this lower temperature can increase blower life. In both pressure and vacuum systems dehumidified air prevents products from gaining moisture through the conveying system and helps to eliminate buildup inside receiving vessels and convey lines.

At AIS we have a wealth of experience in the pneumatic conveying industry. Let us work with you to design a solution to your particular process.

Design Criteria For Bulk Storage

In general, the following formula can be applied when sizing dehumidification systems for bulk storage.

VxNx1/2xC/60=CFM required

V = volume of the silos
N = number of silos at that volume
C = number of air changes per hour required
Typically a 3-4 air changes per hour is recommended as a starting point

Industries Served

These are just a few industries that handle ingredients that benefit from the use of dehumidified air.

Food	Tire & Rubber
Plastics	Nutritional Supplements
Pet Food	Food Additives
Chemical	Cleaning Supplies
Candies & Confectionary	

The dehumidifier shown supplies dry air to a common plenum that feeds a silo purge system and three individual pressure conveying systems. The use of dry air in this system ensures that all of the products remain free flowing and build up is kept to a minimum.