

Humidity Control for Pneumatic Powder Conveying

Humidity / Moisture Control is a critical element for various forms of powders such as fine salt, detergents, flour, powdery foods, calcium phosphate, baking powder, wheat starch, plastics resin etc. Pneumatic conveying as a means of powder conveying system is widely used in many powder processing operations such as in handling transfer of food powders, flour in a mill, bakery or confectionery.

**Effects of Uncontrolled Humidity**

The powder is thus always in movement and it may cause obstruction in free flow when contacted by moisture. Generally, every material has an affinity to absorb moisture when contacted by moist air and release moisture when the surrounding air is dry.

Due to the stickiness nature of the hygroscopic powders, they get stuck into nozzles, conveying belts and mixing machines leading to increased maintenance time and bad hygiene.

- Stickiness – Powder gains properties of adhering or sticking to a surface and get stuck into conveying belts causing bad hygiene which ultimately leads to deteriorating of product quality.
- Cluster formation – Due to excess moisture similar particles of powder gather closely together forming buildups inside the mixing machine and causing blockages in free flow of powder.
- Lump formation – A large piece of powder sticks together without a definite shape causing obstruction in the nozzle passage and increasing the maintenance time.
- Caking – Moist environment forces powder to change into a solid mass which leads to increase in product wastage and slowing down of production process.

Causes of Uncontrolled Humidity

The level of moisture absorbing affinity differs in case of various hygroscopic ingredients as they are more sensitive. The absorption of moisture causes many hygroscopic ingredients to stick and cluster together.

General Recommendation**Food powder processing**

In order to retain quality of powdery foods, they need to be dried at low temperatures.

Applications	Temperature (°C)	Humidity (% RH)
Instant Coffee Processing	26	25
Flour	24	10
Starch	24	20
Gelatin	24	10-30
Milk Powder Storage	21-36	15-30
Confectionary-Chocolate Covering	21-32	45
Coffee Packaging	18	40
Dry Spice Conveying	<48	12-16 Gr/Lb

Pharmaceutical and chemical powder

Moisture content of chemical powders / tablets is the most important factor controlling the flow properties of conveying process. Chemical powders and tablets are transferred to packaging via high velocity air streams or pneumatic conveying. Majority of chemical powders are hygroscopic in nature which makes them stick on the surface and ultimately leads to cluster formation. This leads to the clustering and clogging of the powder feed to the tableting press and to high speed two piece capsule filling machines.

Bry-Air Solution

Bry-Air offers simplest and most economical solution to humidity related problems. Bry-Air dehumidifier absorbs moisture from the air to prevent biscuits to loose their dryness and hence avoids formation of clogs. Dehumidification is considered to be the most efficient solution to overcome the problem of lumping and caking. It also prevents sticking of powder on packing machines, hoppers or other parts. Moreover, it ensures an easy, free flow of powder through the packing machine into containers.