

## CONCEPTS

## Waterproofing the 'gummy' matrix



**Right moisture levels enhance shelf life of confectionery items. Dinesh Gupta discusses one of the solutions developed by his company to control moisture during the confectionery manufacturing process**

The food industry continuously incorporates sophisticated technologies to maintain the growth fuelled by changing consumer tastes and lifestyles. Every processor endeavours to ensure that the food product reaches the consumer with the right flavour and perfect shape, with its shelf life intact.

Moisture or rather uncontrolled humidity during processing, packaging and storage, often plays the role of a party spoiler. Moisture control is essential in every segment of the food industry in the spheres of storage, production, packaging, processing and low temperature drying.

### Moisture menace in confectionery

Chocolates, hard candies, chewing gums, bubble gums, etc. contain large ingredients, which are hygroscopic. When the humidity is high, these products regain moisture, become sticky and get prone to mould formation. This inhibits the natural flow as it sticks to the high-speed processing and packaging machinery and to the wrapping material. The processing thus slows down and creates a problem of hygiene, resulting in loss of production as well as loss in the final product quality.

The uncontrolled moisture during the manufacturing and coating process of confectionery causes the following problems:

- Change in the structure/dimension of the film core interface
- Grainy and irregular coating
- Increase in residual moisture content and

improper adhesion – degradation of coating quality presence of moisture

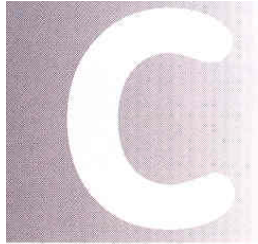
- Sugar bloom and change in flavour.

### Humidity: A possible threat to confectionery quality

The solution to the problem lies in maintaining required stringent conditions of temperature and humidity and in surrounding the processing, packaging and storage areas with dry air. Bry-air dehumidifiers lower the moisture content of the surrounding air maintaining RH as low as 1% at a constant level regardless of the ambient conditions during the production, storage and packing to help improve the quality and retain the freshness of the chocolates longer.

Bry-air dehumidifiers have been helping to ensure that the required humidity conditions are maintained in processing, coating, packaging areas of many confectionery biggies like Cadbury, Wrigley, Nestle, M&M, Perfetti, etc. Bry-Air dehumidifiers have been successfully functioning during the gum coating process at the Wrigley Company's facilities in Kenya and India.

Chocolates need to be stored at 35 + 5% RH at 25°C for safe storage in order to retain its original flavour and aroma. Cadbury installed Bry-Air dehumidifier when it was facing environmental challenges in its food and drinks packaging hall. Prior to the installation of the Bry-Air dehumidifier there were problems related to increase in machine



**CONCEPTS** downtime, difficulty in achieving the desired quality product, etc.

**Humidity control during gum coating**

• **Problem faced:** Generally, two types of chewing gums are available for consumption, sugar-coated type and sugar-free coated type. In the presence of humidity, the coating on the gum becomes uneven and cracks or discoloration occurs. The shelf life of the coated product also decreases, if processed under high humidity conditions.

• **Procedure:** Formed chewing gum is loaded into coating machines where the different types of coatings are applied. The coating machines are fed with dry air at different conditions depending on the type of coatings and as described below:

**Sugar-coated gum**

- On sugarcoated product, a lower supply air temperature is required to ensure uniform and smooth coating
- The dry air supply into the coating machine is at .25+/-2 C and 10-15% RH.

**Sugar-free coated gum**

- On this product the supply of air temperature is not that important, typical supply air conditions are 35-40 C and 5-6% RH.



**The coating process in candy and chewing gum**

The production of coated confectionery is an intricate process. This includes candy with or without soft jelly centres, chocolate centres, centres with combinations of chocolate and nuts, coated gum pallets (sugar free/sugar) and many others.

One of the most widely used coating techniques is pan coating. The term pan comes from the coating apparatus used to coat soft-centre candy with a harder candy shell.

The coating pans are used to apply the outer coating into the raw centres as they tumble in a large drum. Spray nozzles mounted inside the pan coater drums evenly distribute the liquid to form the coating and as the water evaporates, the hard shell is formed. If the heated air blowing through the pans is too moist, the drying times are significantly longer and, therefore, the throughput is greatly diminished. The drying time of the coatings applied in pans becomes the critical factor in maximising the throughput in this entire production cycle.

**Bry-Air Solution**

The only solution to the problem lies in surrounding the processing and manufacturing area with dry air.

Bry-Air dehumidifiers find application in the following areas

Gum drying	52-66 C	15-25% RH
Chewing gum manufacturing	20-25 C	20-40% RH
Gum ball manufacturing (Forming rolls)	21 C	45% RH
Candy storage	18 C	40% RH
Hard candy packaging	21-24 C	35-40% RH

Bry-Air dehumidifiers offer the simplest and most cost-effective solution to moisture/humidity control during the coating process. The recommended design conditions of the inlet airflow of the coating pan should be kept at an ambient temperature of 32-35°C and 15-20% RH, which corresponds to absolute humidity of 30-40 grs. ☺

The author is President & Director Bry Air (Asia), a group company of Puhwa Enterprises, U.S.A. Inc. contacted at [dgupta@pahwa.com](mailto:dgupta@pahwa.com)