Coating process optimization using cooled mirror hygrometers

Application background

In modern pharmaceutical plants many tablets require coating before they are pressed. These tablet coatings are usually polymer and polysaccharide in nature and need to be strong and stable enough to survive handling.

Furthermore the surface and finish of the tablets need to be smooth in order to allow them to be swallowed easily. The coating also helps mask any unpleasant tastes or odours associated with the active ingredients. Colourings are added to improve their appearance, and the coating allows an identifying mark of the manufacturer to be stamped into the tablet which is a common requirement of regulatory authorities.

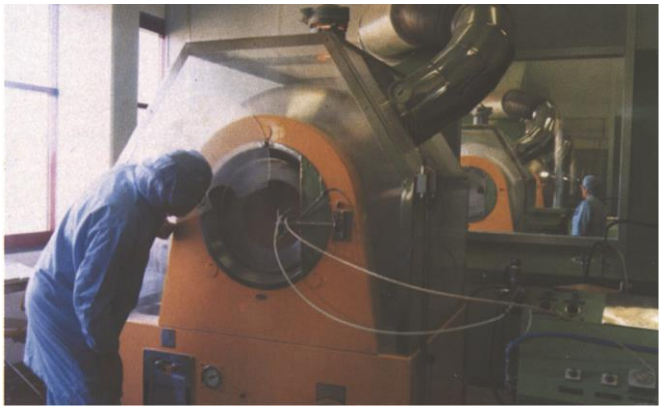
Special enteric coatings are used with a variety of different drugs. These coatings are comprised of special polymers that are resistant to the acid in the stomach, but can be broken down by the intestinal fluids. These serve several purposes:

- To prevent irritation of the stomach from the active ingredients in the tablet core
- To protect the active ingredients from stomach acid
- To deliver the active ingredients into the intestine
- To create a delayed release action for repeat dosage medicines

Irrespective of the type of coating applied, a consistent finish is always a requirement to meet the rigorous quality standards of pharmaceutical manufacturing.

Coatings are also important in other industries such as confectioneries where they are made up of sugar or vegetable oil and are used to seal off the softer cores of the candies.

Techniques



The coating of tablets usually takes place within a perforated rotating drum. There are angle baffles placed in the drum that, along with the air flow inside, help mix the tablet bed. This allows the tablets to be lifted and turned from the peripheries to the centers of the drum to ensure that all surfaces of the tablet is evenly and uniformly coated with the sprayed coating or deposited coating.

The atmosphere within this rotating drum needs to be closely controlled for temperature and dew point or relative humidity to ensure that the coating is uniform and smooth in appearance.

Once the coating is applied the drying of the coating takes place by drawing heated air through the tablet bed from a fan. This air flow also requires temperature, humidity and volume control to ensure controlled drying and extraction.

Monitoring the dew point of both the inflow and outflow of this air gives an indication of the progress of the drying process. This allows the drying time to be kept to a minimum, reducing overall costs of the drying process.

Michell Instruments

Michell instruments provide the Optidew 501 precision chilled mirror dew-point meter that is best suited to this application. The Optidew 501 offers highly accurate measurement of dew-point, temperature and relative humidity. Dew-point measurement is based on the proven, fundamental optical chilled mirror measurement principle, giving long-term drift-free performance. Dynamic Contamination Control (DCC) ensures that measurement accuracy and stability are maintained even when contamination is present on the mirror – protecting the sensor from airborne contaminants found in the air inflow and outflow pipelines.

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