On-Line Moisture Measurement for Sugar Coated Confectionery

Understanding the Process
Moisture management is a critically important to confectionery production. Poor moisture regulation directly affects production yield due to losses on drying from coating cracking and unacceptable product non-uniformities. Studies show that by using the MM710 to monitor moisture, dryer cycle time can be reduced by 25% equating to a throughput increase of 33%.

Companies who have invested in the MM710 have seen substantial benefits gained from improved process performance through reduced waste, improved yield and higher profitability.

Measurement for Control
The hard sugary coating on many types of confectionery is applied in layers that are built up in a continuous coating operation. Often, the confectionery has a chocolate centre that has been cast or pressed into the desired shape, typically ellipsoidal. Whatever the centre, the coating must be applied uniformly and efficiently to produce a high quality product at maximum process efficiency.

Using Accurate Moisture Measurement to achieve Process Efficiency gains of up to 33%

BENEFITS:

- **Improved Product Quality:** over-drying can cause the coating to crack; under-drying will cause non-uniformities
- **Increased Productivity:** the coating process can be run much closer to its upper tolerance limit without fear of over drying, thereby reducing material loss and avoiding chipping and dusting
- **Energy Savings:** from more efficient use of the drier
- **Time Savings:** By discontinuing drying as soon as each layer is dry
- **Reduced Operating Costs:** as a consequence of the savings and efficiency improvements

The Measure of Quality™
On-Line Moisture Measurement for Sugar Coated Confectionery

On-line Measurements
The coating operation involves the sequential addition of moisture and powdered sugar in a rotating drum. Hot air is passed through the drum and the MM710 near infrared gauge views the tumbling products. Process control without moisture measurement is based on assumptions made about the time taken to dry each layer. This can mean that coating cycles are started later than needed. A more informed decision can be made on the basis of moisture content rather than time, avoiding over- or underdrying, so that each coating layer is started as soon as the previous coating is dry.

Using Moisture to Control Drying
The absolute moisture content of the coating is not important, as it is very low relative to the weight of each piece. This means that it is not necessary to check the calibration of the gauge against a slow, laboratory method: the MM710 moisture measurement for confectionery coating processes has been developed to respond proportionally to the dryness of the surface of the product being coated. The drying cycle can be displayed on a PC using NDC’s GaugeToolsXL™ software or the measurement values output to a plant SCADA system or even just a simple display.

Process Trend
The graph shows the gauge response during the multi-stage coating process against time. The point where each coating is fully dry is clearly visible between stages.

The NDC MM710 Solution
Designed specifically to meet the challenges of food processing environments, the performance of the MM710 on-line gauge ensures rapid payback. The On-line Measurement is made in real time, replacing time-consuming laboratory analysis, which can be prone to sampling, operator, and experimental error, and in any case gives only historical information.

Key Features
- Food-safe Stainless Steel Housing
- Sealed to IP67
- Food-safe Sapphire Optical Window
- Excellent pass height tolerance to the moving product
- No sensitivity to ambient light variation
- No influence from temperature or humidity variations

MM710 can be used as a stand-alone device with measurements displayed on the Operator Interface or on a PC as trends using the GaugeToolsXL™ software provided, helping operators to monitor the process. MM710 can also be integrated into an automated process control system, with connectivity via analogue (4-20mA loop) or a variety of databus protocols (see additional data sheets).