Moisture, Oil and Degree of Brownness Applications

Precision on-line and at-line measurements for improved baking and frying control

► Savory Snack Foods
► Crackers
► Biscuits/Cookies
Taste, Texture and Appearance
These are all key quality attributes that determine the success of a food product in the market. It’s important to test the product for moisture, colour and oil during the manufacturing process to achieve repeatable product consistency and “freshness”, but this involves the use of multiple analytical technologies.

NDC Technologies has integrated its proven Degree of Bake or Brownness (DOB) measurement into its highly successful MM710e on-line food gauge and at-line InfraLab analyzer to provide simultaneous measurements of moisture, oil and DOB.

Determining the optimum degree of brownness at the production line can be highly subjective and down to a process operator’s perception of the optimum colour. NDC’s approach to measuring brownness is designed to closely imitate the response of the human eye to changes in brownness. This enables product colour to be standardized to ensure that all operators bake or fry to the same target.

Real-Time, On-Line and At-Line Measurements
With no special skill required, the MM710e and InfraLab provide process vision far beyond that of conventional testing with unprecedented feedback to the process controller for improved control of moisture, oil and DOB. This offers financial benefits such as:

► Reduced start-up times and scrap
► Production of a more consistent product within specification
  (minimizing “checking” and preventing of over- / under-baking or frying)
► Improved operating efficiency
► Acrylamide mitigation
Example Applications for Degree of Brownness

### Improved Baking Control – Biscuits/Cookies/Snacks

NDC’s MM710e gated on-line measurement for Degree of Bake

Different Degrees of Bake for biscuits or cookies

### Improved Frying Control – Snack Products

Fryer exit*  
Flavouring and Packaging*

Different Degrees of Brownness for potato chips – sorted
Applications Overview

### NDC Snack Applications

<table>
<thead>
<tr>
<th>Product</th>
<th>Moisture</th>
<th>Oil</th>
<th>Surface Brownness</th>
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<tbody>
<tr>
<td>Corn based snacks - fried</td>
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<tr>
<td>Corn based snacks - baked</td>
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<td>Potato based snacks - fried</td>
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<td>Biscuits/Cookies</td>
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<td>Crackers</td>
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### Measurement Performance

Indicative values for the measurement accuracy for each parameter:

- Moisture: range 0 to 4%, accuracy 0.1%
- Moisture: range 5 to 25%, accuracy 0.5%
- Oil: range 20 to 45%, accuracy 0.5%
- Surface Brownness: range - user selectable

The accuracy quoted is twice the standard deviation of the residual differences between the MM710e or InfraLab measurements and the values obtained for samples taken from the line and tested using an approved reference method in the laboratory. Delivered pre-calibrated, both MM710e and the InfraLab are designed to be quickly adjusted to agree with your primary reference methods, such as gravimetric oven or wet chemistry, using the NDC software provided.

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