

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

Improved Baking and Frying Control

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:

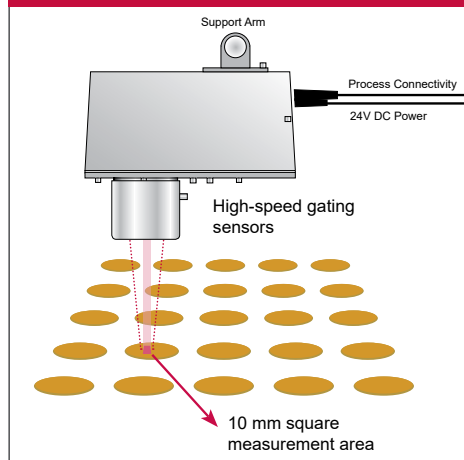
- ▶ Reduced start-up times and scrap
- ▶ Production of a more consistent product within specification (minimizing "checking" and preventing of over- / under-baking or frying)
- ▶ Improved operating efficiency
- ▶ Acrylamide mitigation



IP65/7, Stainless Steel, Vortec Cooled (optional)

Example Applications for Degree of Brownness

MM710e – Biscuits/Cookies



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

InfraLab – Biscuits/Cookies & Snacks



Improved Frying Control – Snack Products



Fryer exit*



Flavouring and Packaging*

MM710e – Snack Gauge



Different Degrees of Brownness for potato chips – sorted

Applications Overview

| NDC Snack Applications | | | |
|-----------------------------|----------|-----|------------------|
| Product | Moisture | Oil | Surface Browness |
| Corn based snacks - fried | ■ | ■ | ■ |
| Corn based snacks - baked | ■ | ■ | ■ |
| Potato based snacks - fried | ■ | ■ | ■ |
| Potato based snacks - baked | ■ | ■ | ■ |
| Extruded snacks | ■ | ■ | ■ |
| Biscuits/Cookies | ■ | ■ | ■ |
| Crackers | ■ | | ■ |

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 Browness: 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.



*We acknowledge the kind permission of Heat and Control for the use of images contained in this brochure:

www.heatandcontrol.com

NDC Technologies is represented in over 60 countries worldwide. www.ndc.com

a **spectris** company

NDC Americas
Tel: +1 937 233 9935
Email: info@ndc.com

NDC Belgium
Tel: +32 4 239 90 10
Email: sales@ndcinfra.com

NDC Japan
Tel: +81 3 3255 8157
Email: ndcjapan@ndc.com

NDC Italy
Tel: +39 0331 454 207
Email: ndcitaly@ndc.com

NDC India
Tel: +91 9650752420
Email: ndcindia@ndc.com

NDC United Kingdom
Tel: +44 1621 852244
Email: enquiries@ndc.com

NDC China
Tel: +86 21 6113 3609
Email: info@ndcinfra.com

NDC Germany
Tel: 08001123194
Email: info@ndcinfra.com

NDC Singapore
Tel: +65 91994120
Email: apacsales@ndc.com



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