Application Note

AN 1029.00

Using the SpectraTrend HT for the On-Line Measurement of Edible Nuts

"Online color quality measurement can provide real time information on your process and product."

ABSTRACT

The color of peanuts, mixed blends, and tree nuts can be assessed immediately during roasting or cooking, while still on the line, using the SpectraTrend HT.

This application note reviews the online measurement of nuts to provide information about product quality.

The world's true measure of color

HunterLab

The measurement of color can help reduce costs associated with visual acceptance and can indicate process changes such as temperature fluctuations. On-line measurements are continuous but allow for rapid reaction to process changes. This holds an advantage over intermittent laboratory analysis which is often performed after a batch is made.

In the case of nut manufacturing, there are a number of process variables that can impact the color of the finished product. These variables include operating temperature, line speed, and dwell (or resident) time. The first step to determine the overall effect of these variables, is to track a run from beginning to end. This information helps determine the cause and effect of process variation, and allows for prompt, corrective action to minimize off-quality product, increase production throughput, and maximize equipment usage. Plant operating costs can ultimately be reduced and overall product quality can be improved. On-line measurements can also result in reduced laboratory labor and material sampling costs as the laboratory quality control function can be reduced to less frequent color auditing and final color approval.

The SpectraTrend HT sensor is typically mounted above the conveyor belt after the roaster or oven. The nuts pass under the sensor in layers or piles and the STHT makes frequent color measurements sending a stream of colorimetric data in a read-time audit of the process.

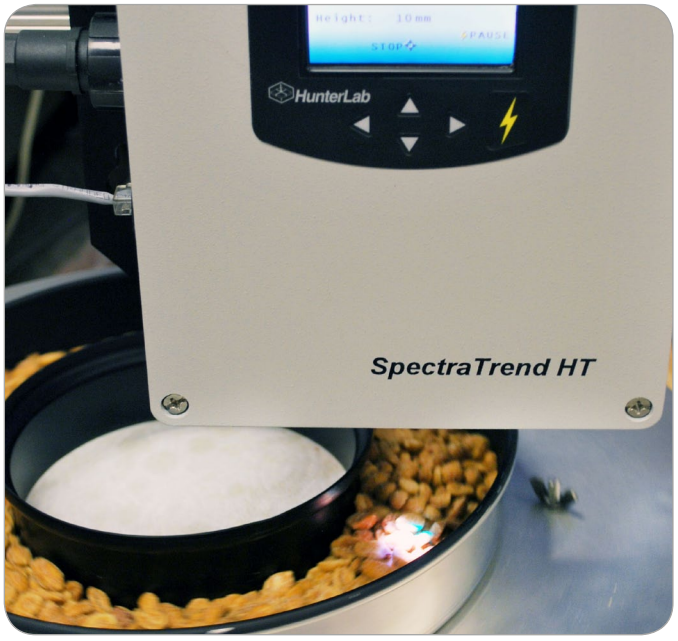

Figure 1. SpectraTrend measuring the color of honey roasted peanuts.

Figure 2. Light and dark limit samples of cashews that could be measured online.

There are several items that should be considered when installing the SpectraTrend HT over a nut line.

- A measurement procedure should be developed to address the colorimetric data.
- The nuts should completely fill the area being measured and multiple layers of nuts should be available under the sensor. When the height cut-off feature is used, the sensor will automatically disregard the belt color to eliminate interference of that color.
- To optimize sample presentation, it is a good practice to use a leveling device to flatten and spread the nut product to a constant depth.
- Hitching to the laboratory instrument D25LT or LabScan XE; ColorFlex EZ for crushed nuts or nut powder is advised when the SpectraTrend is used to compare to occasional laboratory samples. This allows the online tracking of product color while occasional laboratory samples are measured to validate the on-line measurement.

The color of roasted peanuts for snack foods, candy ingredients, peanut butter, and other peanut productscan be used to predict the optimal quality of the product. For instance, a two degree roaster temperature change can result in up to a two unit change in L*, which is directly related to the taste of peanut butter. For roasted peanuts, the L* value is usually between 50 and 70, the a* value is between -10 and 10, and the b* value is between 40 and 60. If the L* value were lower (35, for instance), an alert would be issued indicating the roaster is scorching the nuts. An update frequency of 5 seconds is recommended, which means that all measurements made in that 5 second period are averaged together for the final data provided.

CONCLUSION

Measuring product color online provides real time information that can be used to monitor and guide the process to a consistent end product.

More Information about Color Measurement on our HunterLab Blog

measuretruecolor.com

ABOUT HUNTERLAB

HunterLab, the first name in color measurement, provides ruggedly dependable, consistently accurate, and cost effective color measurement solutions. With over 6 decades of experience in more than 65 countries, HunterLab applies leading edge technology to measure and communicate color simply and effectively. The company offers both diffuse/8° and a complete line of true 45°/0° optical geometry instruments in portable, bench-top and production in-line configurations. HunterLab, the world's true measure of color.

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