

The image shows a HunterLab SpectraTrend HT color measurement device. The device is a white, rectangular unit with a black control panel on top. The control panel features a small blue LCD screen displaying 'STOP' and 'PAUSE' buttons, and four directional arrow buttons. The device is positioned over a black bowl filled with peanuts. A white circular sample holder is placed inside the bowl, and the device's sensor is positioned directly above it. The text 'HunterLab' is visible on the control panel, and 'SpectraTrend HT' is printed on the front of the device. A semi-transparent grey box with the text 'Application Note' is overlaid on the top right of the image. Another semi-transparent grey box with the text 'No. 1061.01' is overlaid on the right side of the image.

Application Note

No. 1061.01

On-Line Measurement of Edible Nuts

... helps determine the causes and effects of process variation, allowing prompt corrective action to minimize off-quality product, increase production throughput and maximize equipment usage.

Abstract

The color of peanuts, mixed blends and tree nuts can be assessed immediately after roasting or cooking while still in process using the SpectraTrend HT. Such measurements provide information about product quality and sufficiency of cooking or roasting. Color measurements can help reduce costs associated with color complaints and can indicate when there is a process upset such as a rise or reduction in temperature. On Line measurements allow you to react quickly to such upsets and to measure product constantly, rather than just reading intermittent laboratory samples.

There are a number of process variables that can impact the color of nuts. Control parameters such as operating temperature, line speed, and dwell time all have an effect on color. In order to determine how these variables affect color, it is important to first get real-time measurements of color that can be tracked accurately and consistently from the beginning stages of a run through to the finished product. This information helps determine the causes and effects of process variation, allowing prompt corrective action to minimize off-quality product, increase production throughput and maximize equipment usage. As a result, plant operating costs are ultimately reduced and overall product quality is improved. On-line measurements also result in reduced laboratory labor and material sampling costs as the laboratory quality control function is reduced to infrequent auditing.



Considerations on Mounting the SpectraTrend HT

The SpectraTrend HT sensor is mounted above the conveyor belt just after the roaster or oven. Mounting over the oven band is not recommended. The nuts pass under the sensor in layers or piles and the instrument measures the nuts that it sees and provides colorimetric data that is updated frequently.

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

1. 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 can automatically disregard the belt color to eliminate interference of that color.
2. To optimize sample presentation, a plow or other planning device that can flatten and spread the product to a constant depth is recommended.
3. Hitching to the laboratory instrument (Aeros) is advised when the SpectraTrend HT is used to constantly track the product color while occasional laboratory samples are measured to validate the on-line instrument.

Roasted Cashews

For roasted cashews, the values obtained from the SpectraTrend HT tracks well with Aeros readings after hitching and readings were taken using a 5-second update period. The acceptable product L* range was 48-53 units. Based on the resident roasting time, the SpectraTrend HT was able to detect and change in oven temperature in about ten minutes.

Roasted Peanuts

Color of roasted peanuts for snack foods, candy ingredients, peanut butter and other peanut products is important. For instance, a two-degree roaster temperature change can result in up to a two unit change in L^* , which is 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^* values are lower (35 for instance) you might be alerted that the roaster is scorching the nuts. Bed depth varied by about one inch affecting the L^* value by about one unit. 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.

About HunterLab

HunterLab is the technology leader in color measurement solutions, providing instruments, software, knowledge and service to a wide variety of industries. With over 5 decades of experience in more than 65 countries, HunterLab applies our leading edge technology to your products helping you measure and communicate color simply and effectively.

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