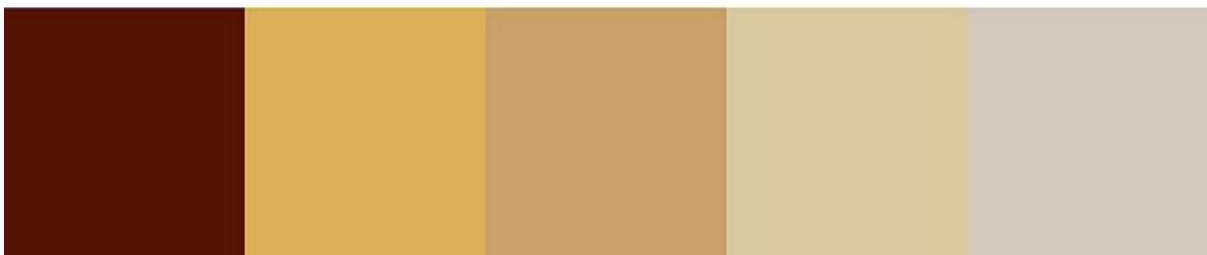


Potato chips might just be the greatest mistake that ever happened to the culinary world. Although the origin of this snack food phenomenon is still disputed today¹, potato chip popularity continues to grow throughout the processed food industry. Today's choices include a multitude of shapes, sizes, textures and colors. However, they all begin with the same basic process of taking raw potatoes and transforming them into the perfect bite-sized snack. Staying competitive in this growing market requires [objective analysis to ensure both the color consistency and quality](#) that consumers demand. Spectrophotometers are the leading tool used to monitor the color standards reference chart for potato chip analysis and improve production quality in today's competitive market.



The color standards reference chart for potato chip analysis is used to monitor and control variations and meet consumer expectations. Image Source: Flickr' user Molly Mason

Using Instrumental Analysis to Monitor Potato Color

The color standards reference chart for potato chip analysis is designed for the visual analysis of potato color, but visual analysis is not always accurate². Human perception varies from viewer to viewer and is highly subjective, leading to variations and inconsistencies. On the other hand, instrumental analysis provides the subjective data needed to monitor potato color and can be calibrated to match the color standards reference chart for potato chip measurement. This method of analysis has been implemented by many of the world's leading snack food manufacturers, who rely on consistency and data to maintain quality and consumer recognition.

Spectrophotometers offer the most advanced method for the color analysis of potatoes. They are both simple to use and highly accurate. This method has been used for many years to monitor both the color of raw potatoes and changes in color during the roasting or frying processes. Measuring color changes and providing subjective data relies on the basic principles of color technology, yet the instrumentation itself has undergone many changes over the years. Advancements in spectrophotometric technology have led to new design elements that meet the specific needs and challenges of the potato chip industry.



Spectrophotometers offer the most effective way to monitor color changes in both raw potatoes and throughout the potato chip frying process. Image Source: Flickr' user Ted Murphy

New Technology Meets the Challenges of Potato Chip Analysis

For many years' spectral technology provided a simple method for collecting color data, yet variations in potato chip size and texture often interfered with accurate color measurement. Leaders in color technology have worked alongside the top manufacturers to develop new techniques and methods to address these challenges. Controlling both the light source and the viewing angle reduced errors and variations from these external variables, creating a solid base for accurate data. The sample viewed area of most spectrophotometers is smaller than the sample being evaluated. To ensure consistent measurements independent of sample size a [color averaging system](#) was developed. For precise color monitoring, software is designed to collect and average numerous readings for various samples. This helps reduce variations and ensure color consistency throughout processing.

As technology continues to improve, spectrophotometers are becoming smaller and more durable in order to meet the needs of mass production. Color process automation technology was developed to offer real-time color data and increase production speed without compromising quality. This

technology improves color control and process monitoring. More so, data can be measured and stored for repeatability and improved quality control.

Despite these advancements in technology, challenges continue to affect color control data and sample measurement quality. The biggest challenge in potato chip sample measurement is the non-uniform structure of the sample. [Non-contact spectrophotometers offer accurate color measurements](#) for nearly any sample structure and size—all without touching the sample surface. These advanced spectrophotometers offered new features such as automated sample height measurement using laser technology, which can be used to monitor sample surface height. As the depth of the non-uniform sample varies underneath the instrument a real time height compensation algorithm corrects the readings to represent how a uniform sample height would read. This new technology has considerably reduced errors in sample surface differences, creating the most accurate form of [color measurement for non-uniform samples](#).

The STHT for online monitoring and its laboratory mate the D25NC are perfect for this application.



The non-uniform shape of potato chips creates many challenges in color measurement. Advanced spectrophotometers utilize non-contact sample measurement to address these issues and provide the data needed for accurate color control. Image Source: Flickr' user Kate Ter Haar

Leaders in Color Technology and Advanced Instrumentation

Advancements in color measurement technology have revolutionized the snack food industry over the past several decades. Throughout this process, HunterLab has been a leading name in spectrophotometers and color data management. Many of the world's leading potato chip manufacturers and snack food industry companies rely on HunterLab products to meet their needs for color quality control. The HunterLab team of experts have responded to many of the challenges listed above and worked hard to develop and create spectrophotometers that address these needs. Our products offer state-of-the-art technology to provide the quality and consistency needed for

consumer acceptance and name-brand recognition. For more information on our product line and to learn why more industry leaders choose HunterLab for all their color measurement needs, [contact us today](#).

1. "The Truth About the Origin of the Potato Chip", September 11, 2014, <http://www.todayifoundout.com/index.php/2014/09/real-story-potato-chip/>
2. "Advances in Potato Chemistry and Technology", January 19, 2016, https://books.google.com/books?id=GO9eBwAAQBAJ&pg=PA576&lpg=PA576&dq=Color+Standards+Reference+Chart+for+Potato+Chip&source=bl&ots=eaEY_4W4-j&sig=bwIGclW-Fw3KJTcDVnPAjcbRju8&hl=en&sa=X&ved=0ahUKEwj9PXPzfzSAhUIr1QKHYv6DCsQ6AEIOzAJ#v=onepage&q=Color%20Standards%20Reference%20Chart%20for%20Potato%20Chip&f=false