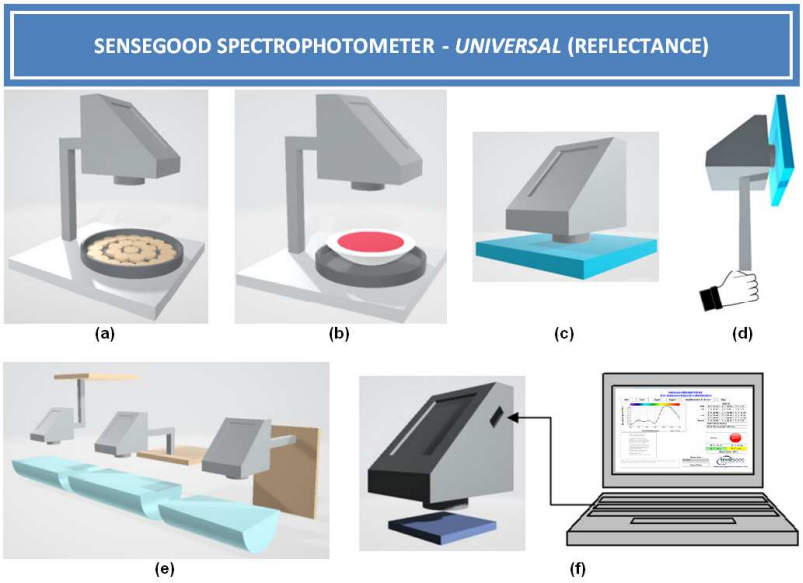
Sensegood spectrophotometer for color measurement and quality - consistency control in papad products

Papad or papadum is a thin crisp disc shaped food which can be consumed by roasting or even frying in oil. It is served along with the meal and also as a starter along with salads. In India, typical annual consumption of papad: 1-2Kg is consumed by 67% people while 3-4Kg is consumed by 24% people. There is also a cluster of people which accounts for 9% which consumes more than 5Kg of papads yearly. [1] This study was carried out for the papads which are made of black gram only. If other varieties of papads (Green gram papads, mathiya, etc) included then total yearly consumption number considerably increases. Apart from papads, there are other related products like khakhras, papad pipes and fryums in variety of shapes and sizes. Papad or its variants like nachos are consumed not only India but also in many other countries. To cater this continuous and largely growing market, manufacturers and suppliers need to meet consumer expectations in terms of quality.

Photo: Papad products: from left – papad, fryums-papad pipes, khakhra

Instrumental color measurement:

Maintaining the authenticity of true color representation is the first preference for any manufacturer. In the process of visual color match; there are factors like eye fatigue, aging of the eye, stress, individual's different expressive perception toward color, and light source that affect the color match decision. Hence, it becomes difficult to make decision of accepting, reprocessing or rejecting the sample based on visual match. And this directly hampers the quality of the final product. While on other hand there are advantages of instrumental color quality control as it provides results with same accuracy, consistency and reliability.



- ✓ Benchtop/ Tabletop: (a) (b) (Rotating sample platform)
- ✓ Handheld/ Portable: (c) (d)
- ✓ Online/ In-process: (e)

- ✓ Solid: (a) (c) (d) (e)
- ✓ Liquid: (b) (e)
- ✓ Paste: (b) (e)
- ✓ Powder: (a) (b) (e)

- ✓ Contact measurement: (c) (d)
- ✓ Non-contact measurement: (a) (b) (e) (Adjustable height)

Works with:
- ✓ 5V adapter (cell phone charger)
- ✓ Power bank
- ✓ Computer/ Laptop (f)

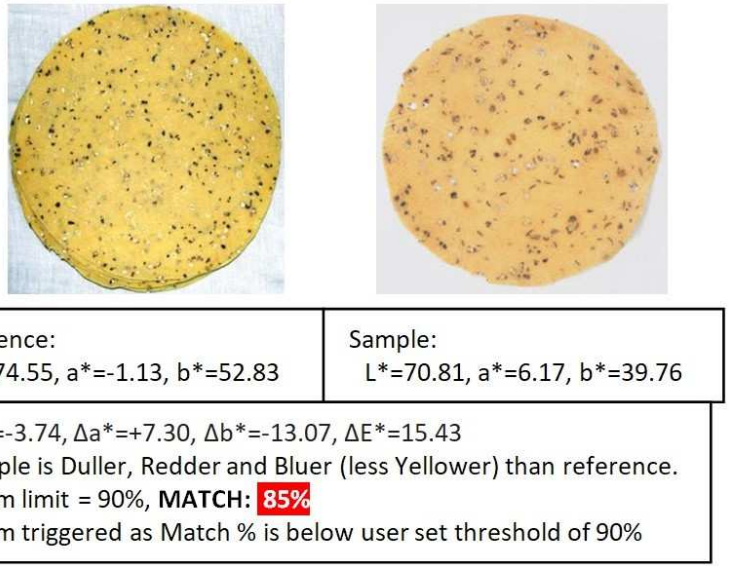
- ✓ Averaging
- ✓ Auto repeat measurement mode
- ✓ Color match percentage
- ✓ Color indices (whiteness, yellowness, …)

- ✓ *SensegoodSmart* – computer interface software utility

Sensegood spectrophotometer for color quality and consistency control in papad products:

Sensegood spectrophotometer is an analytical color measurement instrument that is widely accepted in the industry and research fraternity. From raw material to final product, it comprehensively evaluates the color attributes of various samples, including solids, liquids, powders and pastes. Sample can be non homogeneous with different shape and size. Sensegood spectrophotometer has rotating sample platform with large viewing area (sensor's field of view). It takes multiple measurements over number of rotations and generates average result representing the sample's color. As a result, consistency can be maintained and quality standards can be met with less waste, time, and effort.

Sensegood spectrophotometer helps in picking up even the slightest color difference over the production batches. It helps in finding difference between two colors and shows result in percentage match.



Sensegood spectrophotometer for quality and consistency control in papad products

Photo: Color has direct impact on "perceived" taste. Color is an indication of freshness. Sensegood spectrophotometer provides information regarding color component differences in between sample and the reference. This information assists in quick process parameter controls and reprocessing for color adjustments. Setting and ensuring color tolerances dramatically enhances color quality control. Reference can be saved in Sensegood spectrophotometer and can be recalled at any time to compare it with production batch sample. Sample can be papad, fryums-papad pipes, khakhras, nachos, or any other papad product.

In photo: Color measurement and finding match percentage in papad. Measurement information assists to tune process parameters to achieve right color; minimizing electricity consumption. This in turn saves significant time and cost; and more importantly it leads to a consistent product appearance and wide market acceptance. Indeed, to build and maintain a brand of repute; product's consistency is one of the most important parameter to be addressed.

If matching is poor; below set threshold, Sensegood spectrophotometer provides audible alarm and display indication on LCD to alert operator. Hence operator can quickly react and take appropriate action. The information assists for the prompt corrective action which eventually leads to quick process parameters control, increase in the throughput and maximization of equipment usage. This surely results into low operational cost with improved product quality, consistency and market acceptability.

Apart from color match percentage; Sensegood spectrophotometer provides color representation in terms of various indices such as – Whiteness index, Yellowness index to name a few. Index value is a single number that represents overall color attribute of a sample.

Do more with Sensegood spectrophotometer:
Sensegood spectrophotometer also incorporates continuous auto measurement mode. In this mode, it wakes up at user selectable intervals, takes measurement, compares the sample color with the saved reference, displays percentage match, and alarms to the operator with beeping sound in case if the matching percentage is below preset threshold. It has provision for averaging option in normal mode as well as in auto repeat measurement mode.

Measured CIE L*a*b* values indicate strength of color parameters like: bright or dull, red – green and yellow – blue respectively. Measured color is also represented as reflectance graph, peak wavelength and color temperature on color touch LCD. Sensegood spectrophotometer is non-messy non-contact type instrument which has benefit of measuring sample's color from a distance. Because of this, sensor's optical assembly remains scratch proof enabling long life in retaining calibration. Non-contact measurement avoids any sample contact and contamination on sensor measuring surface. Hygiene is maintained, as non-contact measurement avoids any food contact and bacterial accumulation on sensor measuring surface. Sensegood spectrophotometer is the versatile device that is engineered to work as handheld/portable, benchtop/table-top or in-process/online color measurement instrument.

SensegoodSmart utility:

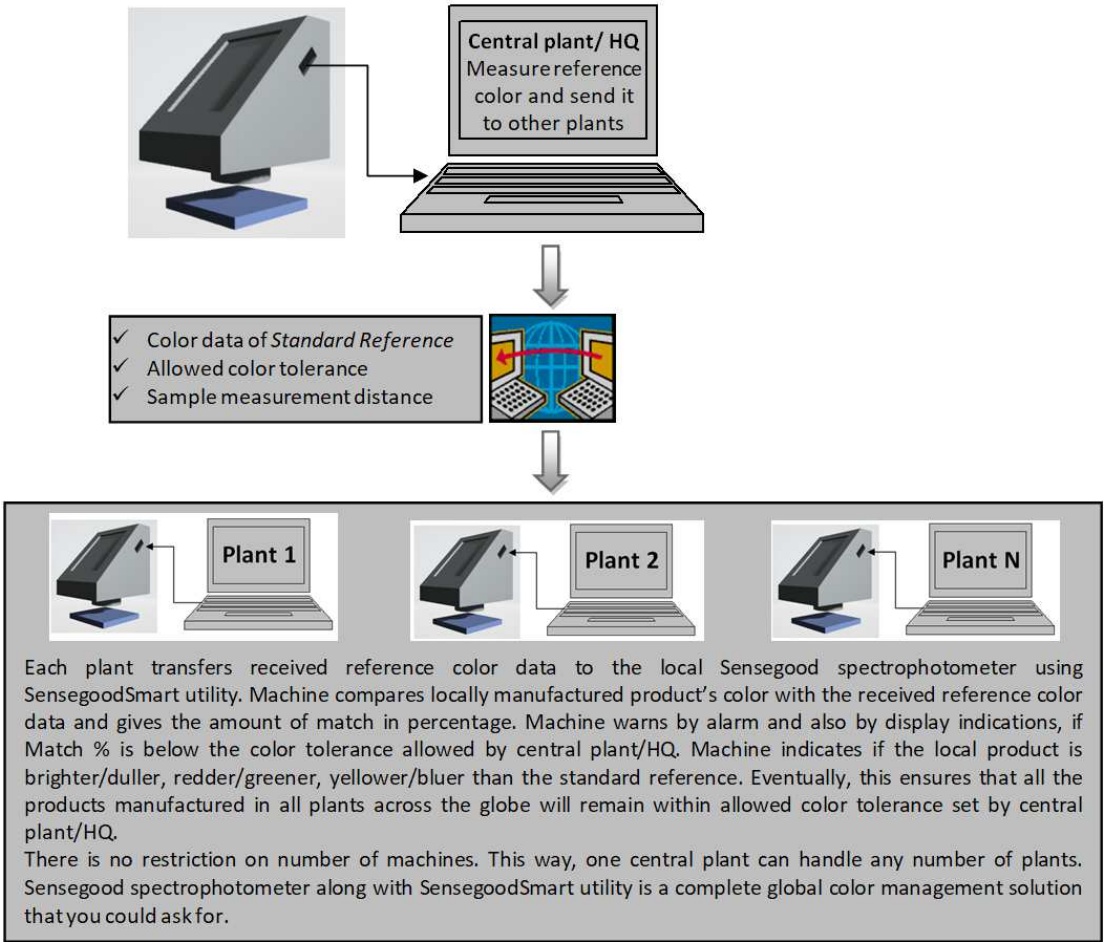


Photo: SensegoodSmart utility for color management across multiple production plants. Apart from this, SensegoodSmart utility enables user to store unlimited number of references to the computer. Any desired reference can be recalled and downloaded to Sensegood spectrophotometer whenever required. The utility provides all color related analytical information on single screen. This feature is even more desirable when using Sensegood spectrophotometer for in-process/online applications.

Sensegood spectrophotometer provides computer interface software *SensegoodSmart* which lets you to convey numeric color data across all production plants that may be located at multiple places across the globe. Each production plant uses Sensegood spectrophotometer to compare color attributes of the product manufactured in their plant with the numerical color information received from central plant or management. This enables them to reproduce each product consistently across all the plants. This feature is highly desirable for wide spread industry with plants at various places. It also assists in color consistency in packaging material supply chain.

Reference:

[1] K Shwetha, Y Nirmala, and N Shobha, "Consumption pattern of papad at household level and its availability in the local market", Karnataka Journal of Agricultural Sciences 22 (2), 399-403, 2009.
https://www.cabdirect.org/cabdirect/abstract/20093330559

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INSTRUMENTS PVT LTD

www.sensegoodinstruments.com
Phone, WhatsApp, Signal, Telegram: +91 79 8484 8002
info@sensegoodinstruments.com

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