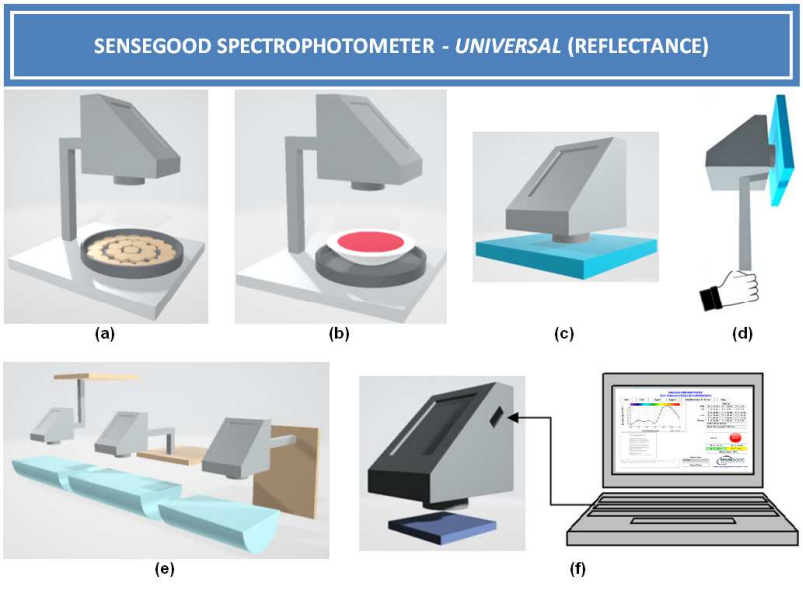
Sensegood spectrophotometer for whiteness measurement and quality control in sago pearls (sabudana)

Sago pearls also known by other names; sabudana, saksak, rabia or sagu. Sago is an edible starch that is made from the pith of an array of tropical palm trees. It's a staple food in parts of the tropics. Indonesia and Papua New Guinea combined produce approximately 94.6 percent [1] of the world production which is followed by Malaysia. Indonesia, the biggest producer of sago starch in the world, produces 585,093 metric ton per year [2]. The most quantity is exported to Europe and North America.

Photo: Sago pearls

Recently number of modern starch factories has increased. Accordingly improvements in hygiene and due to modern processing techniques including hydro-cyclone process, whiteness rating of sago starch has risen to 83 and beyond. [3][4]



- ✓ 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)

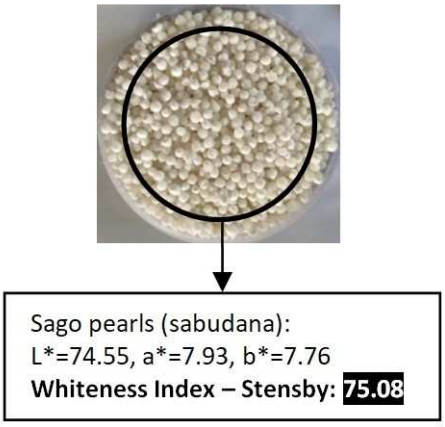
Works with:
- ✓ 5V adapter (cell phone charger)
- ✓ Power bank
- ✓ Computer/ Laptop (f)

- ✓ 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 sago pearls:
Sensegood spectrophotometer is an analytical color measurement instrument that is widely accepted in the industry and research fraternity. It comprehensively evaluates the color attributes of various samples, including solids, liquids, powders and pastes. 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.

The quality and hence the market price of sago is primarily determined by its color and appearance, especially its 'whiteness'. Sensegood spectrophotometer captures sago sample's color and indicates single number – whiteness index to control the consistency and quality of sago pearls.



Sensegood Spectrophotometer for whiteness measurement in sago pearls

Sensegood spectrophotometer assists in maintaining sago quality by measuring whiteness in all production stages. Photo shows whiteness index measurement in sago pearls using Sensegood spectrophotometer. Measured sample has whiteness index of ~75; below industry standard, whiteness improvements need to be considered.

Measured color data is also represented as CIE L*a*b*, 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.

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.

References:

[1] P. Istalaksana, Y. Gandhi, P. Hadi, A. Rochani, K. Mbaubedari, and S. Bachri, "Conversion of natural sago forest into a sustainable sago palm plantation at Masirei District, Waropen, Papua, Indonesia: feasibility study," in Proceedings of the 8th International Sago Symposium, Y. O. Karafir, F. S. Jong, and E. Fere, Eds., pp. 65–77, Universitas Negeri Papua Press, Manokwari, Indonesia, 2005. https://ci.nii.ac.jp/naid/10029619341/

[2] M. Ahmad, "Farmer empowerment to increase productivity of sago (Metroxylon sago spp) farming," International Journal on Advanced Science, Engineering and Information Technology, vol. 4, no. 3, pp. 129–133, 2014. https://doi.org/10.18517/ijaseit.4.3.384

[3] Book by Hiroshi Ehara, Yukio Toyoda, Dennis V. Johnson, Sago Palm: Multiple Contributions to Food Security and Sustainable Livelihoods, 2018, Springer. ISBN 978-981-10-5269-9. Available at: https://www.springer.com/gp/book/9789811052682

[4] Water conservation and effluent reduction in the cassava starch extraction industries using hydrocyclone technology [2000] by Trim, D.S. Marder, R.C.(University of Greenwich, Central Avenue, Chatham Maritime (United Kingdom). Natural Resources Institute) Available at: Food and Agriculture Organization of the United Nations: http://agris.fao.org/

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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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