

## Optical turbidity and solid content sensor SATRON VOF

Satron VOF transmitters are accurate turbidity sensors, designed for use in various applications within food & beverage and paper & paper industry. The sensors are designed for inline measurement and their modular construction offers a high degree of flexibility making them suitable for various processes and ensuring minimal installation costs. Sensors wetted- (AISI 316, Hastelloy-C, Titanium), lens- (Sapphire, Spinel) and process sealing materials (EPDM, FKM, FFKM) ensure excellent chemical resistance.



### Satron VOF, Remote probe

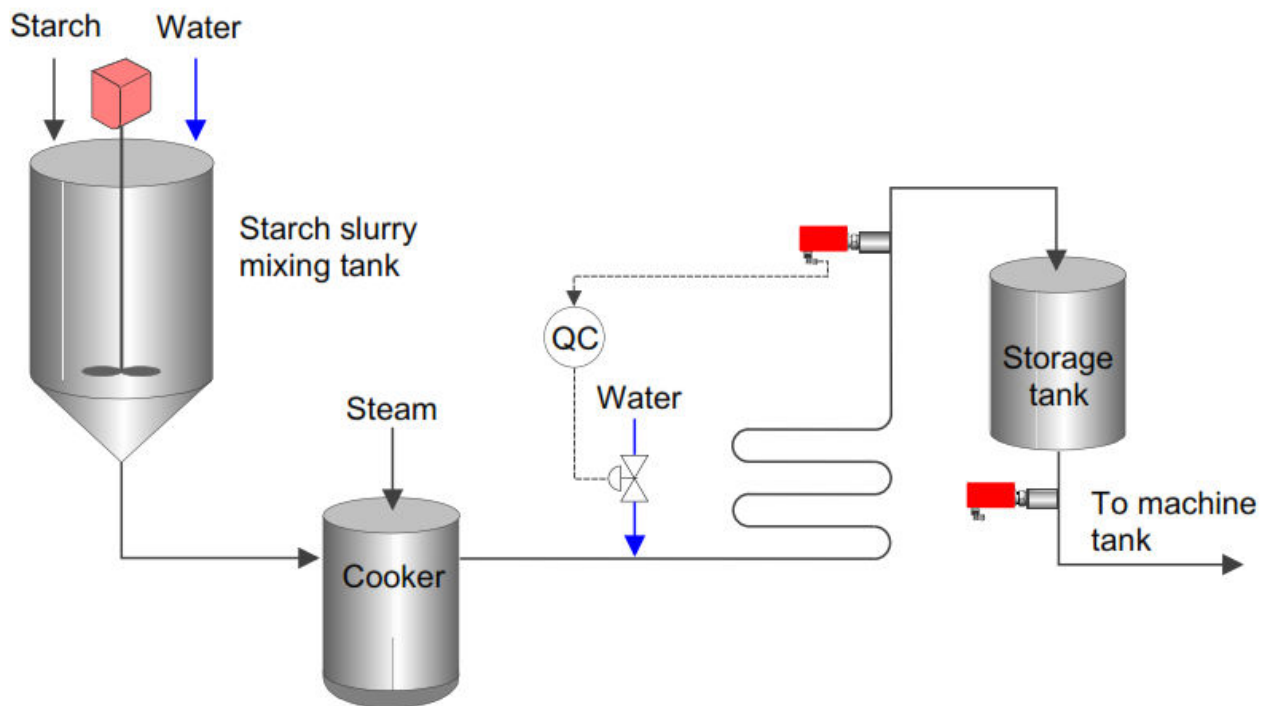
Satron VOF measurement principle is based on the attenuation of the light intensity in the process media caused absorption and/or the scattering of substances. Light emitted from the light source enters the process and passes through the process media and is detected after the optical path by a hermetically sealed photodiode. The sensors utilize 375-1100nm wavelength for measurement depending on the measured process media.

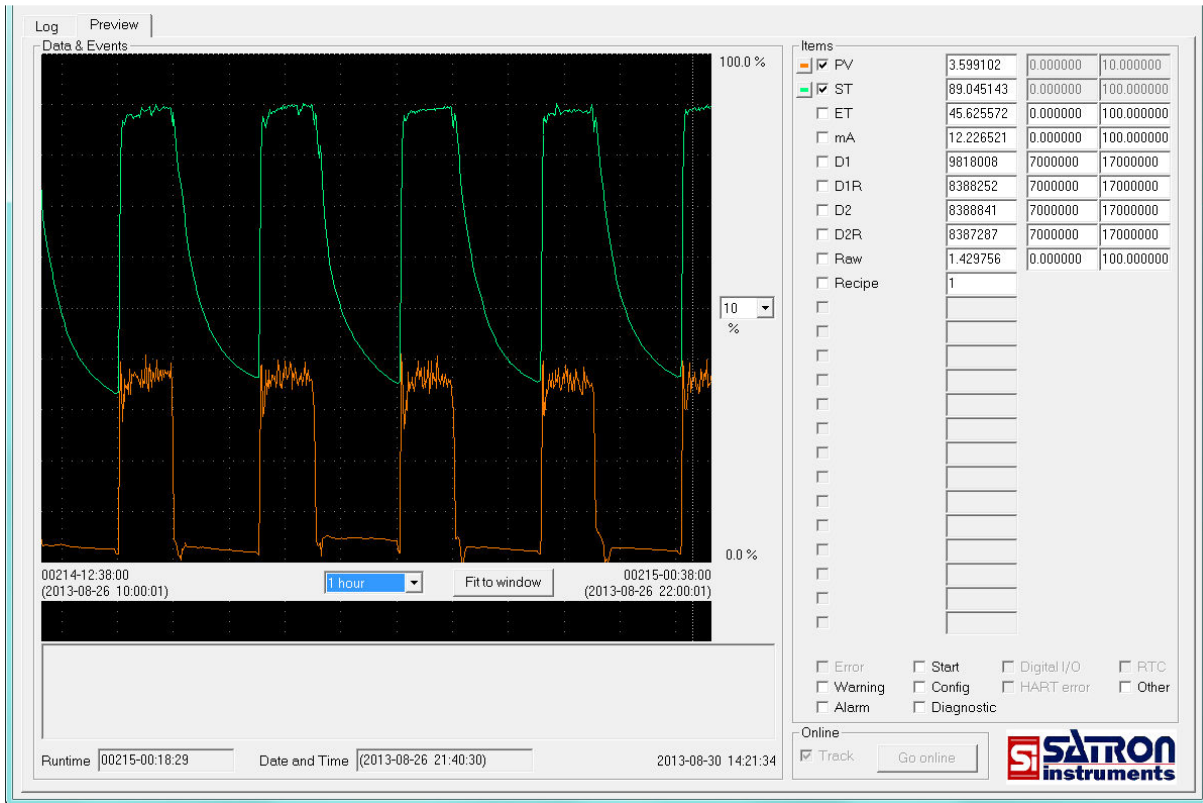
Present day chip technology allows designing compact sensor with extensive memory space to hold measured values, error messages and calibration and configuration parameters for many months' period. Sensors are built in with HART protocol data communication, nowadays a standard feature in instrumentation industry.

### Starch Cooking – Wet End & Size Press

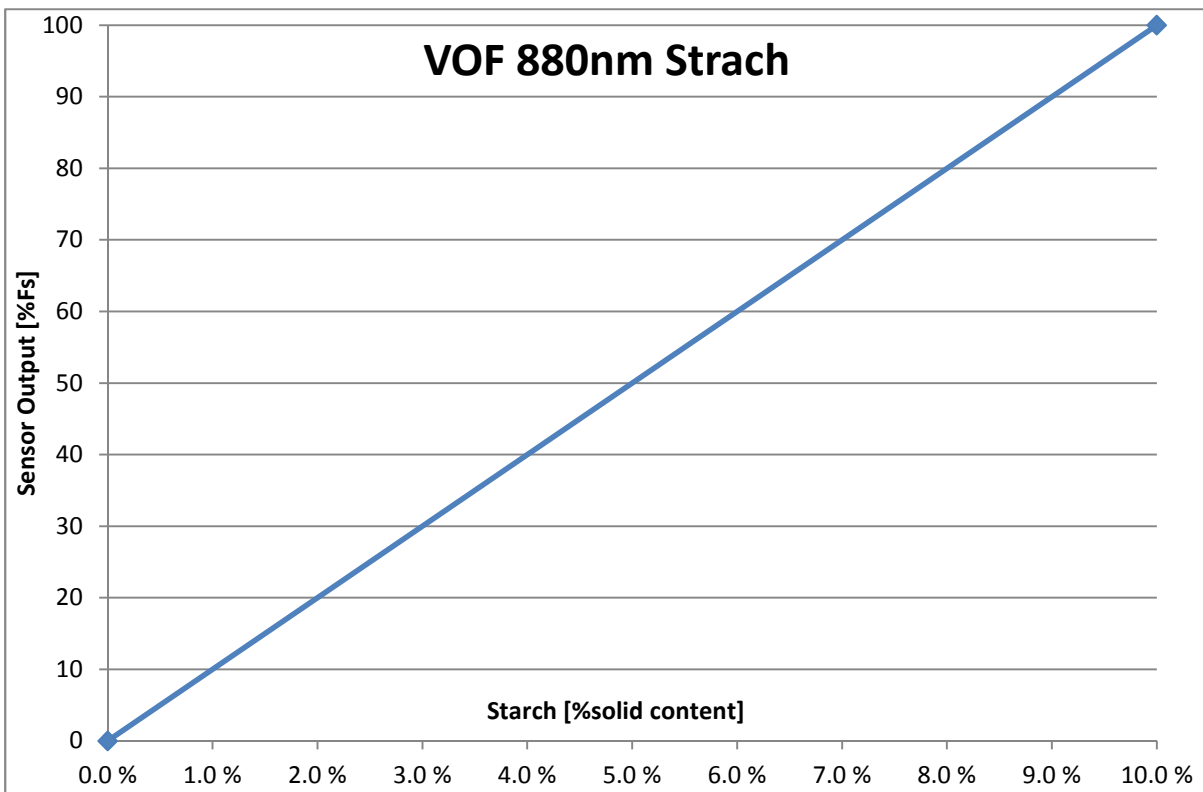
In a typical sheet of copy paper for instance, the starch content may be as high as 8%. Both chemically modified and unmodified starches are used in papermaking. In the wet part of the papermaking process, generally called the "wet-end", the starches used are cationic and have a positive charge bound to the starch polymer. These starch derivatives associate with the anionic or negatively charged paper fibers / cellulose and inorganic fillers. Cationic starches together with other retention and internal sizing agents help to give the necessary strength properties to the paper web formed in the papermaking process (wet strength), and to provide strength to the final paper sheet (dry strength).

In the dry end of the papermaking process, the paper web is rewetted with a starch based solution. The process is called surface sizing. Starches used have been chemically, or enzymatically depolymerized at the paper mill or by the starch industry (oxidized starch). The size - starch solutions are applied to the paper web by means of various mechanical presses (size presses). Together with surface sizing agents the surface starches impart additional strength to the paper web and additionally provide water hold out or "size" for superior printing properties. Starch is also used in paper coatings as one of the binders for the coating formulations which include a mixture of pigments, binders and thickeners. Coated paper has improved smoothness, hardness, whiteness and gloss and thus improves printing characteristics. In starch preparation the liquid is usually cooked in continuous or batch cookers. The cooked starch is diluted to desired concentration before storage. Typical measurement range of starch is 0-20%





**Batch process concentration and process temperature**



**Starch concentration vs. sensor output**