

"STATE OF THE ART" FREENESS MEASUREMENT !

Satron VCF - A Simple "In Line" Freeness Transmitter

SATRON VCF uses a proprietary LED strobe measuring technique to measure freeness using the strobe's multi-wavelength response from the furnish. The VCF can be used in many applications, where lab samples can be drawn, and the measurement results can be correlated to the laboratory determined freeness values. In addition, 0...12% Cs applications may be measured with the other measurement channel included in the VCF. Typical applications include freeness measurements to and from the refiners and the feed to the paper machine. The Satron VCF does not require regular maintenance. Unlike other freeness measurement technologies the VCF is inserted directly into the process line and can be installed close to the pump.

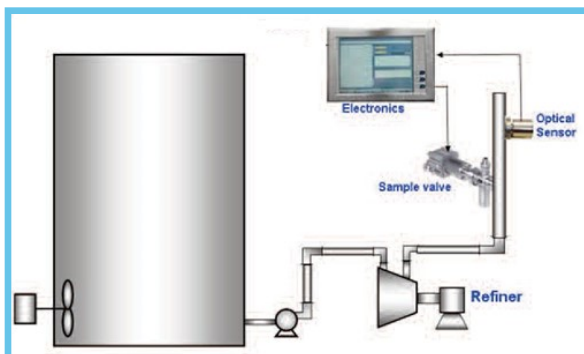
Cost effective solution that performs well is a simple device.

RDU(Remote display unit)

The Satron VCF transmitter remote display unit can be installed up to 45 ft. away from the sensing unit. The Display unit has electrical connections for 3 binary inputs, 3 relay outputs and two 4-20ma outputs. All connections can be active. Intuitive, menu driven interface makes for simple set-up, calibration and troubleshooting functions. VO Advisor(SW) allows for computer interface.



Excellent Reliability and ROI.



Satron VCF Optical Freeness Transmitter features:

- 4-20mA two wire connection.
- No moving parts, No regular maintenance
- Excellent Repeatability, Linearity and Resolution
- Regression based calibration
- Immune to process variations: Flow rate, pressure, temperature, turbulence
- Calibrate transmitter easily.
- Breakthrough technology.



Zero and Span adjustments:

Zero elevation: Calibrated span can be selected from the RDU for the measuring range. These inputs may be managed by using Satron VO Advisor and a computer.

Reliable and maintenance free:

No moving parts and no sample lines guarantee high reliability and no maintenance.

Easy operation:

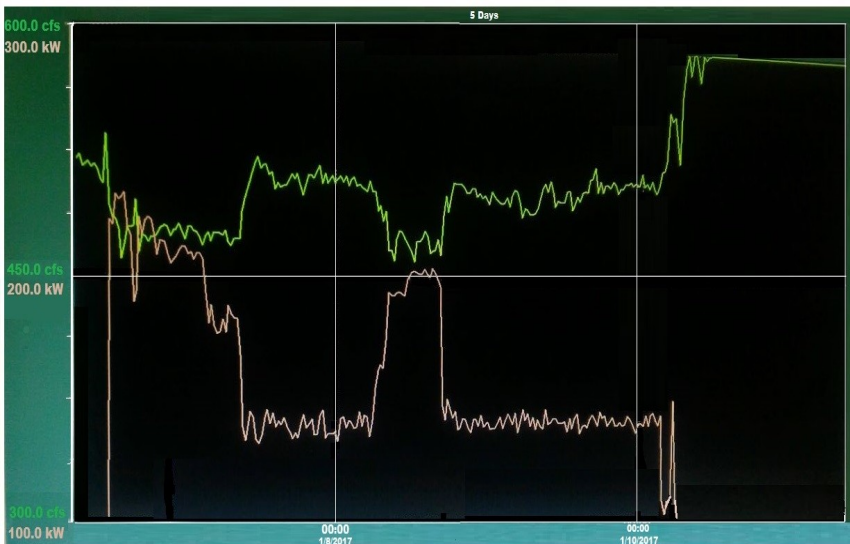
Setting the measurement range and calibrating the meter is simple and easily accessible through the RDU.

Refiner Control:

Satron VCF measures the effect of the refining process by providing a real time Freeness output. Sensor can be installed right next to the pump or right after the refiner.

Actual Results:

Trend below shows Refiner load versus Freeness output of the transmitter.



Importance of Freeness.

Freeness, or drainage of a pulp suspension in the paper machine wet end, is one of the most important variables that affect the quality, productivity, and efficiency of papermaking. It is very difficult to predict stock drainage behavior on the paper machine. However, the VCF Freeness Sensor has been developed to provide a real-time value of freeness for information and as input for automatic control of the refiners. The result is that paper machine performance is improved dramatically.

Freeness is a measurement of the rate at which water drains from a pulp suspension through a mesh screen or a screen plate. It is measured to assess drainage characteristics of a stock during its preparation before being fed to the paper machine head-box. This characteristic, which depends upon the pulp stock, fiber flexibility, and the fines content of the pulp, can be used as an indication of sheet formation, and freeness affects the final sheet properties such as tensile strength, burst, tear, and fold. With an accurate in-line freeness measurement, papermakers can identify the causes of stock variation and by adjusting furnish components, changing the amount of re-cycled pulp, and varying refiner load, to minimize or eliminate the stock variations and increase production efficiency. Improved uniformity of stock drainage on the wire, leads to less load on the refiner and more efficient drying. This reduces energy costs, increases production, and improves paper quality.

Reliable measurement for managing Process Control.

The VCF is not affected by paper machine speed. The Freeness measurement cycle is one second. This makes a fast control system to manage the refining. Freeness can be used for feed-forward control strategies for vacuum and wet-end control.

Refining Control is the most common application for freeness measurement. Changes in the management of the freeness values have an immediate effect on the drainage rate at the wet end of the machine. The measurement can be utilized in a cascade control scheme for Refiner Load Control. Mills report fewer web breaks after implementing refining control based on "on line" freeness measurements resulting in higher machine efficiencies. Freeness correlates directly with strength properties of the paper and can be used in real time models to predict end product properties.