

Aurelia PSMQ On-line Stiffness tester – Background and technology

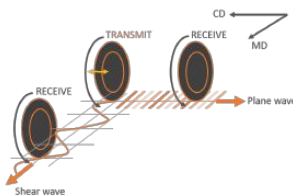
Based on ultrasound technology, which measures the tensile strength of the web in real time and automatically predicts the different strength properties of the material. Gives a complete picture of paper quality for optimization: Automatic prediction of all important strength properties in MD and CD direction:

Tensile Strength, Elongation, Tensile Stiffness Index, Ring Crush Test, Concora Medium Test, Corrugated Crush Test, Shortspan Compression Test, BURST, Bending Stiffness, MD/CD Tensile Stiffness Ratio, Jet/Wire Ratio.

Accuracy and reliability

Aurelia guarantees that each strength deviation (RCT, SCT, tensile strength, ...) reaches the minimum correlation to the factory laboratory measurement result, which is at least R2 95% within 2 Sigma.

The ultrasound wave travels through a moving sheet of paper. Col. See 1 picture. The wheels send and receive ultrasonic waves through layers of paper and cardboard. Figure 2. Measurement compared to laboratory measurement.



The PSM sensor consists of 3 contacting wheels: 1 transmitter and 2 receivers. The fundamental properties it reports are MD & CD Tensile Stiffness Index (TSI)

Fig 1

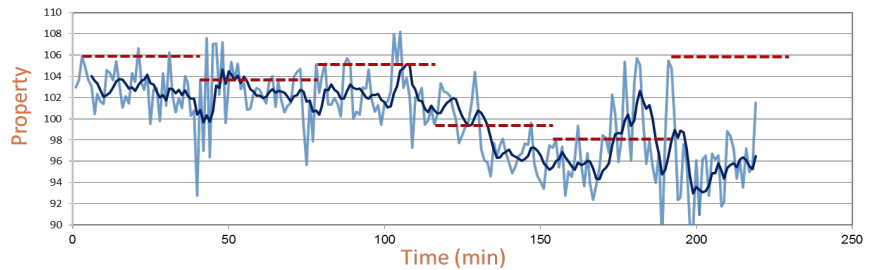


Fig 2

History and background

Amcor Packaging developed the system already 30 years ago and also patented the technology. They only used it for internal use, for PM optimization, and never commercialized the product.

After the patent expired, the technology is now available and delivered to customers around the world.

Russel Allan, MD Aurelia Group, Melbourne Australia.

Real-time measurement significantly reduces the variation in quality characteristics – and saves raw material and money

Quality requirements can be lowered, which leads to corresponding cost savings, such as: to reduce raw materials; fiber, fillers and starch.

Verified results from users:

- No need to wait for laboratory measurements
- Optimize starch consumption
- Minimize tensile strength fluctuations
- Optimize the use of different pulp components
- Reduce the amount of waste - Monitor how wastepaper and recycled fiber amount changes strength values

Hamburger -Container Germany - Reference No. 1

The first mill in Europe to test the PSMQ on-line stiffness tester. The company has 5 factories in Germany, Turkey, Ukraine, Austria, Russia.

The main products are corrugated cardboard raw materials, Liner, Fluting, Testliner

Excerpts from the Commentary:

The results were very positive in all test series and the PSM-Q sensor corresponded to the strength values measured in the laboratory, the correlation gives an $r2 > 95\%$. "Furthermore, we were already able to determine these first tests, that we were not always energy efficient in production and we were able to reduce specific processing energy and save energy immediately" *Pls see separate statement*

Gelsenkirchen Mill, Packaging and Gypsum Board Machine 2022.
Mr. Wolfgang Leitner Director,
Center of Investment & Technology .

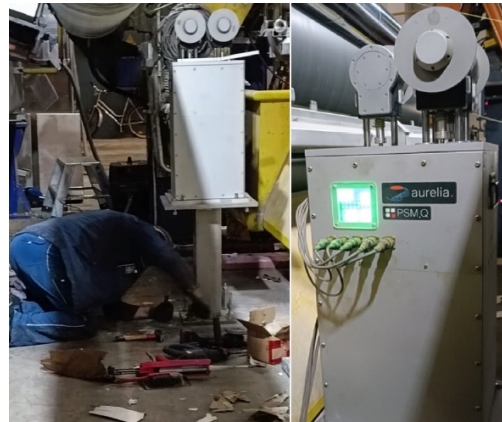


Installation, testing

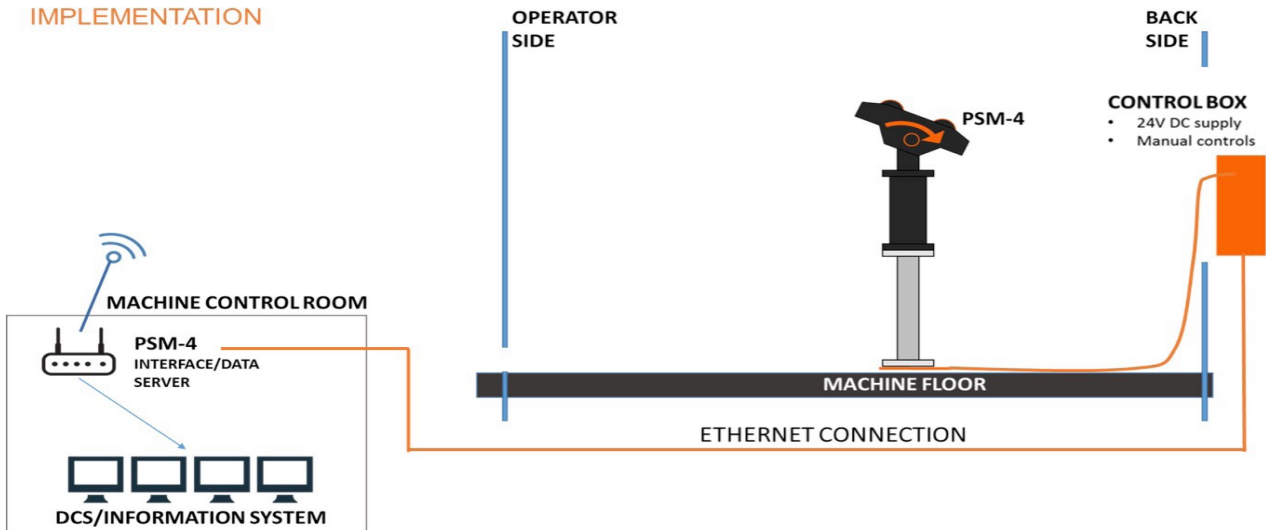
Easy to install and does not require any cables.
WiFi connection.
The system is easy to test before purchase.
Does not leave marks on the track.

Connection to the factory system:
analog signal 4-20mA, or OPC.

The measuring head is installed under the track in the dry end



IMPLEMENTATION



Aurelia is represented in Scandinavia and Finland by Nipman Paper Technology

Since 2000, Nipman has been selling and marketing new and revolutionary process management technology for the Scandinavian paper industry.

Principals and partners: RollResearch, roll measurement and grinding technology. Avatron Systems, on-line porosity measurement. Pesmel, logistics automation. AFT-Global, Stock prep, AFT POM approach flow: Norway and Denmark. Pixact, Stock Monitoring. Visilab, portable moisture meters. Sensorik, On-line moisture meters for difficult places. Tasowheel, Actuators, Profiling systems, QCS



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